

UNIVERSITÉ DE NEUCHÂTEL
FACULTÉ DES SCIENCES ÉCONOMIQUES ET SOCIALES

**BUILDING INDUSTRIAL NETWORKS IN THE AGRIBUSINESS SECTOR
OF CHINA - WITH A SPECIAL REFERENCE TO THE BROKER'S ROLE**

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POUR OBTENIR LE GRADE DE DOCTEUR ES SCIENCES ÉCONOMIQUES

PAR

Jian Jun Li

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Monsieur Jian Jun Li est autorisé à imprimer sa thèse de doctorat ès sciences économiques intitulée :

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Il assume seul la responsabilité des opinions énoncées.

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Michel Dubois

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List of abbreviations

AMPC	Agricultural Means of Production Corp
BOD	Board of directors
CCE	Contractual Cooperative Enterprise
CCP	China Communist Party
CNAMPC	China National Agricultural Means of Production Corp
CRS	Contractual Responsibility System
CAHPA	China Animal Health Product Association
CNPA	China National Pesticide Association
CS(s)	Case study (studies)
DNW(s)	Dynamic network(s)
GDP	Gross domestic product
FAO	Food and Agricultural Organization of the United Nations
GM	General manager
NPK	N= Nitrogen, P = Phosphate K= Potash
NW(s)	Network(s)
MCI	the Ministry of Chemical Industry
MNE(s)	Multinational enterprise(s)
MOA	Ministry of Agriculture
MOFTEC	Ministry of Foreign Trade and Economic Co-operation
INW(s)	Internal network(s)
JV	Joint venture (s)
POE(s)	Private owned enterprise(s)
SAMPC	Shanghai Agricultural Means of Production Corp
SBCI	Shanghai Bureau of Chemical Industry
SETC	State Economic and Trade Commission
SNW(s)	Stable network(s)
SME(s)	Small and medium enterprise(s)
SODE(s)	State owned distribution enterprise(s)
SOE (s)	State owned enterprise (s)
SORI (s)	State owned research institute(s)
RMB	Renminbi (Chinese currency, rate ~USD1: Yuan 8.23)
WTO	World Trade Organization

Preface

It is summer time again. I have at last, completed the work of my thesis. While the learning journey continues, I would like to seize this moment expressing my sincere gratitude to the persons and organizations in the following locations, for their great support to the completion of this work.

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1 INTRODUCTION

1.1 BACKGROUND TO THE RESEARCH

According to the policy and the aims laid out in the State's Tenth Five Year Plan (China in Brief, www.china.org.cn, 2002), China plans to maintain relatively rapid economic growth over the next five years, based on attaining a GDP in 2010 that is double the GDP of 2000. The next 5-10 years will be an important period for China in readjusting its economic structure, and fine-tuning the market economy system and continuing the opening-up process. Key aims described in China's current plan include optimizing its industrial structure, and improving the agricultural, industrial and service sectors nationwide. Among many, one of the challenges is to continue reforming state owned enterprises (SOEs). According to the World Bank Report, only by fundamentally reorienting internal and external enterprise incentives toward market principles can China solve the core of its SOE problems. (News Release No. 98/1425, World Bank). New measures - including the debt-to-equity swap, sale of smaller SOEs to private companies and the establishment of large asset management companies - have been taken to reform SOEs. Besides this, many of China's SOEs have now been floated on the stock exchange or have become privately owned. However, these and the remaining SOEs **need to further upgrade their management and technological modernization in order to compete effectively both at home and abroad**. Other factors contributing to the dynamic business environment include the emergence of a significant private sector and the increasing competition from the large foreign multinational firms.

As the development of the transitional economy continues, Chinese enterprises are finding themselves increasingly pressured by the challenges companies face elsewhere in the world - such as the globalization process, competition from new products and technologies, the demand and emphasis on value added services, the emergence of flexible manufacturing, rapid environmental changes, and an increasingly mobile and heterogeneous work force - all of which combine to create conditions of unprecedented knowledge intensity, uncertainty, ambiguity, and risk. To respond to these conditions, firms must be fast acting, flexible responsive, and knowledge intensive (Piore and Sabel 1984; Miles and Snow 1986; Child, 1987; Drucker, 1990; Eccles and Nohria 1991; Nohria and Eccles 1992). This calls for replacing traditional approaches to organizations with more adaptive, self-designing, NW organizations. These NW form organizations have become increasingly popular - since they are better than traditional ways of organizing economic activities (Jarillo, 1993) and have been used by more and more organizations at both national and international levels. And their growth is likely to continue (Hakansson and Johanson, 1988).

Over the last two decades strategic alliances between organizations have dramatically increased in China. The overwhelming amount of cooperation within industry stems from formally structured equity share Joint Ventures, cooperative contractual enterprises, franchising systems, or other formal cooperative arrangements. Moreover, vertical integration and market based subcontracting are the common forms that most companies tend to adopt in coordinating their business activities.

During the period from 1990 to 1996 the researcher of this dissertation successfully built up three sizable JV companies in the fields of manufacturing and distributing agricultural chemical products in China for a large Western life-science multinational and performed duties of Chairman and general manager in two of the JV companies. Later, the researcher independently embarked on an extensive direct investment operation aimed at integrating several Chinese SOEs into a consolidated strategic position through a JV approach. In summarizing these past experiences, the researcher felt that the formal JV building process appears to be inflexible, costly, time consuming and less effective - especially, to the small and medium size enterprises - in responding to the dynamics of the transitional economic environment. Consequently, a desire to search different organizational forms which can fit better into China's transitional economic environment emerged. This interest was further inspired by the NW perspective lectured on by Prof Bircher in summer 2000.

Later, a literature review (refer to section 2.3) reflected that most of the research results which constituted the body of knowledge regarding strategic NWs and their building process have been largely developed based on the operation of enterprises in the Western industrial environment (see section 2.2). Furthermore, the available strategy, management, and organization related literatures (when concerning strategic alliances or cooperation between companies in China) are mainly focused on the forms of Sino-foreign JVs (explained in section 1.3). This shows that little investigation on how NW organizations are built and developed in China have been undertaken so far.

As Hinterhuber and Levin (1994:43) stated: **“Strategic networks, the organization of the future”** in this research, strategic NWs, have been identified as a suitable form of cooperative arrangement, particularly for those enterprises operating in the context of China's transitional economic environment. This dissertation has the objective of contributing and expanding the body of knowledge regarding the strategic NW building process in the context of China's transitional economic process by analyzing NW examples between Chinese companies in the agribusiness sector (refer to sections 2.4.4 and 3.3.2.3 for detailed explanations of the choice of business sector).

1.2 RESEARCH PROBLEM

Fredrickson (1983) pointed out, that the strategic management literature has been dominated by studies of the strategy 'content'. Research concerning how strategies are formulated and implemented has tended to be modest. Moreover, process studies have seldom addressed organization performance. Since then research emphasis on the strategic decision making processes has increased substantially (Janis, 1989). This trend included NW studies exploring the relationship between the process and performance by Snow and Thomas (1993). Nohria (1992) discussed four substantive themes that have been the subject of considerable attention in organizational literature:

- 1) The explanation of strategic conducts of firms, in particular their choice to enter into strategic alliances (Pfeffer, 1972; Pfeffer and Nowak, 1976; Williamson, 1985, 1991; Barley et al. 1992; Kogut et al. 1992; Powell and Barantley, 1992; Baker, 1984; Burt, 1983 and Mizruchi, 1989a, 1989b),

2) The explanation of recruitment patterns which result from different organizing efforts, such as efforts to create a new organization or to mobilize change in an existing organization (Zaltman et. al, 1973; Drucker, 1985; Stevenson and Gumpert, 1985; Paul DiMaggio, 1992; Krackhardt, 1992; Nohria, 1992; Faulkner, 1983; Jenkins, 1983),

3) The distinction of the organizational characteristics of new and old competition, does the mode of “NW” organization characteristic of the New Competition represent the new model of the organization? (Burns and Stalker, 1961; Miles and Snow, 1986; Powell, 1990; Baker, 1992; Perrow, 1992; Biggart and Hamilton, 1992 and Gerlach and Lincoln, 1992),

4) The explanation of differences in the power and influence of individuals in organizational settings, where does power come from? (Pfeffer, 1980,1992; Bonacich, 1987; Krackhardt, Brass and Burkhardt, 1992; Burt, 1990,1992; Nohria, 1992; White, 1992; Ibarra, 1992).

Throughout the 1980s, firms responded to an increasingly competitive business environment by changing themselves from centrally coordinated, multi-level hierarchies to various types of flexible NW structures. These NWs coordinated by market mechanisms instead of chains of command are better suited to today's environment. At the same time Miles and Snow (1992) also argued that although some NW organizations failed these failures were caused not by the inappropriateness of the NW form but because of managerial mistakes in designing or operating them (Miles and Snow, 1992:53).

With the objective stated in the preceding section, this study tackles the problems of factors that influenced the strategic conduct of firms in forming strategic alliances - along with the process of design and development of the strategic NWs and their performances. This dissertation informs the reader on how effective NW building strategies are formulated and implemented by the actors (who are theoretically referred to as “brokers”) A proposal is made on a new model for carrying out the NW building tasks whose role fits more to the context of China's transitional economies.

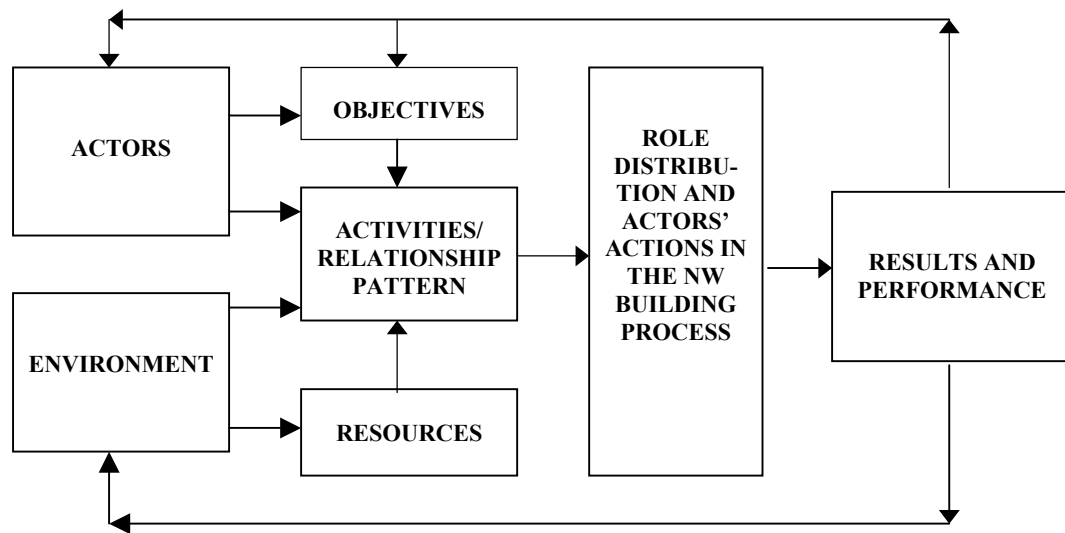
In this context, three research questions are addressed:

- 1. Why do firms form strategic NWs in the agribusiness sector, in the context of China's transitional economy?**
- 2. Why do some NW building processes succeed and some fail in the agribusiness sector, in the context of China's transitional economy with special emphasis on the broker's role?**
- 3. How does a broker effectively perform his role in the context of China's transitional economy in terms of formation, sustainable development and performance of strategic NWs?**

The investigation of the research questions is to be carried out along a framework of selected key variables and the relationships between them- all of which have direct

relevance to the NW building process and outcomes. Figure 1 illustrates the variables to be analyzed in this dissertation.

Figure 1: NWs – Variables to Analyze



Adapted in the model by Institut de l'Entreprise Universite de Neuchatel - Bruno Bircher (1998)

1.3 JUSTIFICATION FOR THE RESEARCH

Firstly, as pointed out in section 1.1, most of the alliance studies on China are mainly on the **formal forms of cooperative arrangement** (such as JVs) normally between two collaborating partners (Newman, 1992; Ahmed and Li, 1996; Davidson, 1987; Mayer, Han and Lim 1990; Adler, Brahm and Graham, 1992; de Bruijn and Jia 1993; Woodward and Liu, 1993; Yan and Gray, 1994; Martinsons and Tseng 1995; Luo, 1996,1997; Vanhonacker, 1997; Nair and Stafford, 1998; Garten, 1998; Gougeon, 1998; Lang, 1998; Imai, 1988; Maruyama, 1991; Ouyang, 1988 and Shenkar, 1990;). Little research in the NW domain of China has been undertaken. Secondly, most research performed emphasized on analyzing the cooperative arrangements between a **foreign firm and a local firm**. It is understandable that most of the international researchers who put emphasis on the Sino-foreign aspects are useful for foreign readers who are concerned about the subject from either their own business or academic interests. In addition, from the research methodology point of view (especially when using a case study method) it is easier for a researcher to identify research sites and carry out empirical investigations in a Sino-foreign JV environment where informants are more familiar with the types of survey method. Likewise, most of the informants in the Sino-foreign JVs more often communicate either in English or other major Western languages than is possible in a purely Chinese enterprise. Consequently, few research publications are available in international literature on the NW form of cooperative arrangement, or strategic alliance in general, between local Chinese firms. This study contributes and expands to the body of knowledge of strategic alliance, and strategic NWs in particular, by specifically researching the strategic process of **building NW form of organizations between different Chinese institutions**.

Additionally, past research on the subject of strategic alliances in China, normally concentrated on analyzing a few specific variables, for example: **Culture** (Frankenstein, 1995; Ahmed and Li, 1996; Lang, 1998); **Distribution** (Tseng, Kwan and Cheung, 1995); **Negotiation**, Hendryx, 1986; Ped, 1986; Yan and Gray, 1994; Nair and Stafford, 1998); **Performance evaluation** (Luo, 1996); **Technology transfer** (Samli and Kosenko 1982; Lassere, 1982; Stewart, 1988; Simon, 1989; Marcuss and Watson 1989; Miller and Rushing 1990; Watanabe, 1993; de Bruijin and Jia 1993; Tsang 1994) and **Human Resource Management** (Sweeney 1996). This dissertation approaches the alliance building process from a NW perspective - thereby not only focusing holistically on several selected **key variables** along the NW lifecycles, but also and (more importantly) on the **relationships** between these variables and how they interactively impact the performance of a given NW alliance.

Finally, China's reform began with agricultural reform, which laid the foundation for the overall economic system reforms. Like many other industries in China, enterprises in the agribusiness sector are facing challenges - on one hand operating in mature and oversupplied domestic markets, increasingly pressured by the competing new technologies and products from home and abroad; while on the other hand receiving more opportunities a freer market economic environment and more autonomy in decision making. Building strategic NWs has important economic implications to the enterprises in the agribusiness sector. These implications include increasing the efficiency in organizing business activities and the acquisition of a better position in responding to increasingly demanding market conditions. The endeavor of providing a new instrument for an effective strategic NW building process in the China context as defined in the research questions is, most of all, justified by this dissertation.

1.4 METHODOLOGY

In following-up the investigation of the research questions identified in section 1.2, methods and research strategies have been evaluated according to their suitability for gaining a holistic (systemic, encompassing, integrated) overview on the rationales of enterprise's NW involvement, as well as the impact of the broker's functioning in the building process linking to the overall NW performance.

Qualitative methods are more suited for this particular study due to its need for comprehensiveness and the limited number of available subjects (actual cases). The research process is mainly composed of data sources, interpretive or analytical procedures, identification of conceptualizing the data and reporting the findings and presenting the acquired academic knowledge. The research is largely a field activity with essentially qualitative, interpretative, and non-mathematical analysis (Strauss and Corbin, 1990; Kirk and Miller, 1986).

Several research strategies – **experiment, survey, archival analysis, history, and case study** - were evaluated according to the three conditions which distinguish them: 1) **the types of research question**; 2) **the extent of control a researcher has over actual behavioral events**; 3) **the degree of focus on commemorative as opposed to historical events** (Yin, 1994:1-15). By comparing the relationship between each of the three conditions and the five research strategies as displayed in Table 1, firstly, an obvious “fit” is identified between the case study strategy and the types of research questions of this research (which are the “why” and “how” type - as shown in section

1.3). These types of questions, in contrast to the frequency questions of “what” or “when,” involve investigations through intense and /or prolonged contact with field situation (refer to section 3.3.1).

Table 1: Relevant Situations for Different Research Strategies

Strategy	Forms of research question	Requires control over behavioral events?	Focuses on contemporary events?
Experiment	How, why	Yes	Yes
Survey	Who, what, where how many, how much	No	Yes
Archival analysis (e.g., economic study)	Who, what, where how many, how much	No	Yes/no
History	How, why	No	No
Case study	How, why	No	Yes

(Sources: Yin, Robert (1989). Case Study Research: Design and Methods. Sage. Pp. 17.)

Secondly (concerning the other two conditions) control over behavioral events and the degree of focus on contemporary as opposed to historical events. Researchers use **histories** strategy when there is virtually no access or control (dealing with the dead past, no relevant persons are alive to report, even retrospectively, what occurred, and when they must rely on of primary and secondary documents, cultural and physical artifacts as the main sources of evidence). To examine contemporary events the case study is preferred. But when relevant behaviors cannot be manipulated researchers then use the same techniques as **history** but add two additional sources of evidence: direct observation and systematic interviewing. The case study’s unique strength (compared to history) is its ability to deal with a full variety of evidence. Moreover in some situations (such as participant observation) unintentional manipulation can occur. Lastly - when research can manipulate behavior directly, precisely, and systematically - **experiment strategy** is used, very often in a laboratory setting or in a field setting (Yin, 1989).

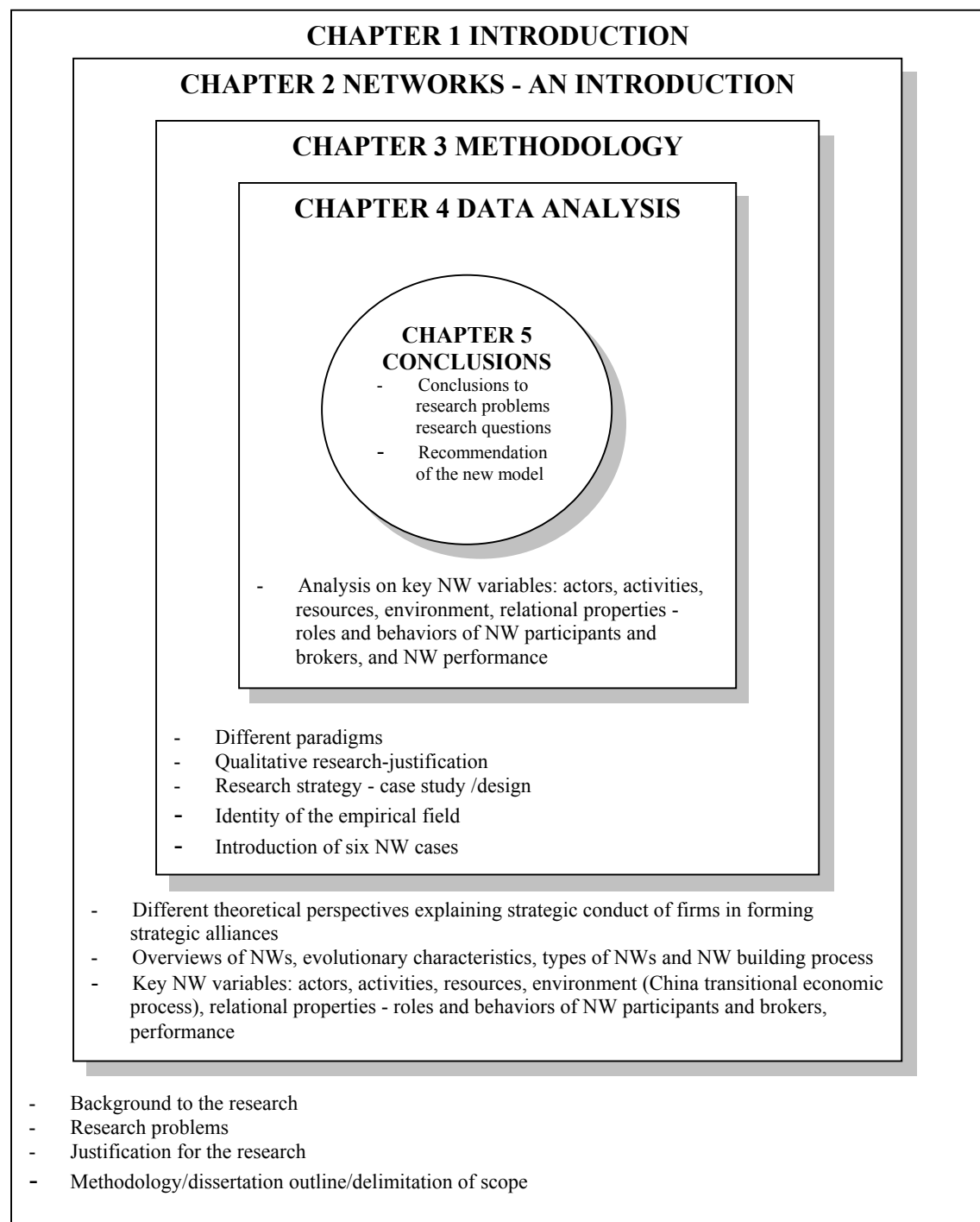
Conclusively, **case study** has been chosen as the research strategy for this dissertation because of its distinct advantage over the other strategies. Specifically, the decision of its selection is justified by this research strategy’s suitability of “how” and “why” types research questions on a contemporary set of uncontrollable events, over which little or nothing can be done by the researchers.

1.5 DISSERTATION OUTLINE

A five-chapter structure is used in this dissertation. Firstly, Chapter 1 briefly introduces the background of the research and the research problems, the method used to investigate the research questions, the thesis outlines (as illustrated in Figure 2), and delimitation scope of the study. Following the introduction, Chapter 2 begins by presenting a set of different theoretical perspectives explaining the strategic conduct of firms in forming strategic alliances. An overview of NWs, the evolutionary characteristics and main types of NW organizations, is introduced thereafter. Finally, literature review focuses on describing the key variables to be analyzed in a NW with particular emphasis on the roles and behaviors of brokers in the NW building process. Chapter 2, by linking to the body of knowledge developed during previous research, provides a broad view concerning the research topic and a useful theoretical framework that guides the subsequent research process of the dissertation. Chapter 3

first presents justifications of using a qualitative research method and different paradigms and their practical implications. After that, the decision of adopting a case study research strategy and the design of a multiple case study format is explained. The data collected through interviews in China, during summer 2001, is presented and analyzed in Chapter 4 along the different developmental phases in the NW building process. (This is identical to the theoretical framework set up in Chapter 2.) Finally, Chapter 5 introduces the conclusions to the research problems and research questions by summarizing and linking the findings of this research to the existing body of knowledge. The dissertation ends by recommending a new model of NW broker, and then indicates the limitations and directions for future research in this field.

Figure 2: Dissertation Structure



1.6 DELIMITATIONS OF SCOPE

First of all, this study (as explained in section 1.3) specifically deals with the broker roles in the process of building strategic NWs between Chinese institutions. Secondly, the empirical investigation of this study is undertaken in the agribusiness sector in China - including industries that specialize primarily in agrochemicals, fertilizer, biofertilizer, hybrid seeds and bee pollination service. For that reason, this research cannot be indiscriminately generalized to the entire agribusiness sector, which covers a wide range of different industries. The last limitation of this dissertation is that, due to resource constraints, the data collecting process was conducted primarily by a single person.

1.7 SUMMARY

This chapter has introduced the core research problems and research questions of the thesis, then followed with research justification. After that, it outlined the path of the research process which leads towards the thesis' conclusion. Finally, the limitations of the research have been presented. With the conclusion of Chapter 1, the research process is directed to the next chapter - literature review - which will present the body of knowledge developed during previous research and form the base of a theoretical framework to guide the reader through the research process of this dissertation.

2 NETWORKS - AN INTRODUCTION

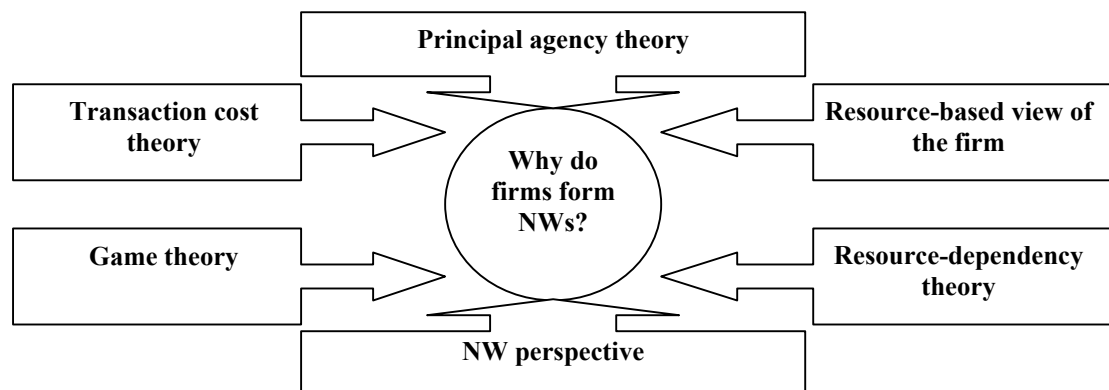
2.1 INTRODUCTION

Chapter 2 presents a set of different theoretical explanations for the formation and development of strategic alliances. The motives of actors in forming NW alliances are to be explained from different theoretical perspectives in section 2.2. Section 2.3, which also presents an overview of NWs that includes the major types of NW form organizations and the evolutionary characteristics of the NW building process. Finally, literature review concerning the key variables to be analyzed in a NW is presented in section 2.4 - wherein, a particular emphasis is put on describing roles and behaviors of brokers in the NW building process - since this subject is largely responsible for the research problems of this study.

2.2 OBJECTIVES AND THEORIES OF NETWORKS - DIFFERENT THEORETICAL EXPLANATIONS

The objective of this section is to use a set of different theories to develop a broad view on the fundamental motives of organizations engaging in strategic alliances or NW cooperative arrangements. Figure 3 illustrates an overview of five theoretical perspectives, consisting of: section 2.2.1 principal agency theory, section 2.2.2 transaction cost theory, section 2.2.3 resource-dependency and resource-based view of the firm theories, and section 2.2.4 game theory mainly explaining the firm's motives toward NW cooperative arrangement. Finally, section 2.2.5 presents a network theory perspective on the objectives and theories of NWs.

Figure 3: Theoretical Explanations of NW Alliances



The rationale for adopting a multiple theoretical approach - instead of using a specific theoretical approach - is due to two reasons. First, the boundary between a strategic alliance and NW is not well defined and second, the research of NWs benefits from the study of the strategic alliance literature. Most of these theories attempting to explain cooperation and NWs have been contested, but taken as a whole they express many of the objectives by alliances and NWs (Bircher 1998:8-9). Each of these theories in a stand-alone approach will rarely be sufficient to explain NW behavior. But the sum of these theories adds up to certain objectives which are often found as the driving forces in real NW situations. Eisenhardt (1989) also emphasized that one single theoretical approach may present only a partial view of the world. Additional

perspectives can help to capture the greater complexity. Consequently, a framework of several complementary theoretical perspectives for the occurrence of strategic alliances is used in this dissertation to provide a more complete view of the rationales behind NW creation.

2.2.1 Principal Agency Theory Perspective

According to Eisenhardt (1989), agency theory has been used by scholars in accounting (Demski & Feltham 1978), economics (Spence & Zeckhauser, 1971), finance (Fama, 1980), marketing (Basu, Lal, Srinivasan, & Staelin, 1985), political science (Mitnick, 1986), organizational behavior (e.g., Eisenhardt, 1985, 1988; and Kosnik, 1987), and sociology (e.g., Eccles, 1985; White, 1985). There are two extreme positions on agency theory - one arguing that agency theory is revolutionary and a powerful foundation (Jensen, 1983) and the other arguing that the theory addresses no clear problem, is narrow, lacks testable implications, and is dangerous (Perrow, 1986). Contrastively, Eisenhardt (1989:58-72) argued that agency theory provides a unique, realistic, and empirically testable perspective that can be used to analyze problems of cooperative efforts.

During the 1960s and 1970s, economists explored risk sharing among individuals or groups (e.g., Arrow, 1971; Wilson, 1968). The risk-sharing problem is one that arises when cooperating parties have different attitudes toward risk. Agency theory uses the metaphor of a contract to describe this relationship (Jensen & Meckling, 1976). There are two kinds of problems that can occur in agency relationships. Firstly, the principal cannot verify that the agent has behaved appropriately. Secondly, the principal and agent may prefer different actions because of the different risk preferences. An overview of agency theory provided by Eisenhardt (1989) is given in Table 2.

Table 2: Agency Theory Overview

Key idea	Principal-agent relationships should reflect efficient organization of information and risk-bearing costs
Unit of analysis	Contract between principal and agent
Human assumptions	Self-interest Bounded rationality Risk aversion
Organizational assumptions	Partial goal conflict among participants Efficiency as the effectiveness criterion Information asymmetry between principal and agent
Information assumption	Information as a purchasable commodity
Contracting problem	Agency (moral hazard and adverse selection) Risk sharing
Problem domain	Relationships in which the principal and agent have partly differing goals and risk preferences (e.g., compensation, regulation, leadership, impression management, whistle-blowing, vertical integration, transfer pricing)

(Source: Kathleen M. Eisenhardt., 'Agency Theory: An Assessment and Review' in *Academy of Management Review*, 1989, Vol. 14, No. 1, 59

Eisenhardt (1989) further argued: “that agency theory has several links to mainstream organization perspectives. At its roots, agency theory is consistent with the classic

works of Barnard (1938) on the nature of cooperative behavior and March and Simon (1958) on the inducements and contributions of employment relationships. As in this earlier work, the heart of agency theory is the goal conflict inherent when individuals with differing preferences engage in cooperative effort, and the essential metaphor is that of the contract.”

“Agency theory re-establishes the importance of incentives and self-interest in organizational thinking” (Perrow, 1986). Two specific contributions to organizational thinking are: 1) the information is regarded as a commodity. This gives an important role to formal information systems of budgeting, MBO, and board of directors, and informal managerial supervision. In order to control agent opportunism, boards are used as monitoring devices for shareholders' interest (Fama & Jensen, 1983). With richer information provided by boards, executives would be rewarded for taking well-conceived actions and more likely to engage in behaviors that are consistent with stockholders' interests. 2) The risk implications, the implication is that outcome uncertainty,¹ coupled with differences in willingness to accept risk, should influence contracts between principal and agent. The agents are expected to act according to the wishes of the principals. Bircher (1998) explained that the agent has much discretion as to how to fulfill his tasks, the principals have to establish control systems, corporate governance, and organization rules etc. which cause agency costs. Bircher further explained that due to some asymmetrical distribution of information in favor of the agent, some internal relations have to be transformed into external relations thus allowing a control of the agent by the market forces. In a NW environment, most of the transactions are based on “at arms' length” transactions. This assures a better control than within a hierarchy environment.

2.2.2 Transaction Cost Theory Perspective

This perspective argues that creation and development of alliances is motivated by the willingness of an organization to improve input/output relationships. Internal costs are higher than the sum of external costs and transaction costs (TC): therefore, it is better to buy resources from outside partners. However, buying in the market on a one-by-one transaction basis may create higher transaction costs than getting involved in a NW (Bircher 1998). Some examples for this are organizations looking to increase their market power, reduce their costs, build trust throughout the relationship to maximize potential payoffs, and so on (Büchel, 1996). Some major aspects of TC summed up by Toral (2000:13-15) are presented as the following.

Transaction cost theory plays a central role in the analysis and interpretation of strategic alliances because it examines a firm's boundaries definition problem. The theory proposes a theoretical justification for the situations where cooperation is preferred to merge and acquisitions or to market spot transactions (Beamish and Banks, 1986; Hennart, 1987; Garrette and Dussauge, 1995).

According to Williamson (1985) “ a transaction occurs when a good or services is transferred across a technologically separable interface.” Therefore, a transaction includes all preparatory steps for the exchange of goods and services as well as the exchange itself, as well as the necessary controlling measures for the proper execution

¹ Agency theory extends organizational thinking by pushing the ramifications of outcome uncertainty to their implications for creating risk. Uncertainty is viewed in terms of risk/reward trade-offs, not just in terms of an inability to pre-plan.

of the contract. All of these processes incur costs. They are defined as the economic equivalent of friction in physical systems. Normally, main TCs constitute search costs for a transaction partner and good business conditions, contractual costs for the closing of a deal, control costs for the correct execution of the contract, and adjustment costs which are caused by a changing environment.

Williamson (1985), in contrast to neoclassical economists, assumed that the firm is primarily a cost-economizing instead of a profit-maximizing entity. The organizational problem of a firm is coordinating transactions optimally and finding the optimal governance structure so that the sum of all costs related to any transaction is minimized. This is done by employing the marginal cost principle of neoclassical economics. The optimal governance structure is not determined by technological or product costs but by its related TCs which depend on behavioral and situational factors (Kootz, 1996).

According to Kootz (1996), Williamson accepts Simon's idea on the bounded rationality of human beings. This concept proposes that economic actors intent on being rational and are rational, but only in a limited manner. The idea of the bounded rationality of economic actors and their limited cognitive abilities precludes the existence of perfect contracts. Therefore, regardless of the environmental situation and the existing governance structure, TCs always arise; they only vary in size. Williamson's model includes another behavioral aspect concerns: opportunism. Human beings are seen as seeking their own interests first - even if this includes forms of deceit. More often than not, opportunism involves subtle forms of deceit - both active and passive. The concept also entails deliberate forms of deceit such as lying, stealing and cheating. The situational factors influencing the size of TCs depend on the transaction, itself, and the infrastructure in which it takes place. First, transactions differ by degree of uncertainty, complexity, and frequency. Second, they differ by their need for asset-specific investments. Equally important is the number of potential transaction partners, also called the 'small number problem'. The fewer partners found in the market, the higher their ability to raise TCs. In addition to these transaction specific criteria, the general legal, technological and economic environment also influences TCs.

Markets represent a good framework for spot transactions where all obligations are fulfilled at once. However, the higher the asset-specific investments are, the more likely a market failure is as well – along with the integration of the activity into the firm. Acquiring another company constitutes one way of integrating transactions and thus of reducing related TCs. Williamson's approach is best suited for an analysis of vertical M&As and related make-or-buy decisions. Under this approach, vertical integration occurs when it is advantageous for a firm to include the activity within its hierarchy, instead of contracting for it on the market. Such a situation is given when the complexity and uncertainty of the transactions is high, when there are only few suppliers, when asset-specific investments are needed, when information is not asymmetrically dispersed between the transaction partners, and when the general transaction atmosphere is so unstable that there is no legal certainty and no sufficient market information system. Cooperative arrangement is undertaken when this structure is able to function more efficiently, - with lower TCs, than markets or hierarchies. These arrangements are mixed organizational modes with transactions governed by long-term contracts and mutual dependency (Toral, 2000:13-14).

According to Eisenhardt and Schoonhoven (1996), “the principle approach for understanding when strategic alliances form is transaction cost economics.” The theory has been effective in predicting vertical integration among suppliers and buyers in mature industries such as automobile manufacturing. However, empirical transaction cost analyses have been limited by a lack of effective and concrete measurements. Measuring TCs directly has not been possible to-date, and this has been the origin for major criticisms against this theory. Another limitation of this theory is that the logic of TC minimization does not capture many of the strategic advantages of alliances such as learning, creation of legitimacy, and fast market entry. This theory is most relevant to static efficiency and routing situations (Kootz, 1996; Toral 2000:15).

The theory of transaction cost has been accepted as a mean of illustration because of its simple approach to a complex problem and its overwhelming presence in literature. There are serious objections to this somewhat simplified model. Sydow (1992) noted that it is far from reality to assume all other factors like the production costs to be stable. Schneider (1985) thought that the transaction cost model assumes limited rationality concerning opportunism of the players on a highly rational game. Furthermore, the explanation of strategic alliance, from a TC perspective, fails to address how alliances interconnect to bind the firms into a network of relationships (Barley et al. 1992).

2.2.3 Resources-dependency Theory and Resource based View of the Firm Perspective

The focal point of resource-dependency perspective is the reduction of environmental uncertainty and management of external interdependency in order to maintain stability. This perspective explains that NW relations of cooperative arrangements help the actors to get access to the critical resources for attaining their objectives by remaining independent while simultaneously collaborating with others.

The resources dependent model has roots in Selznick’s work, as well as in Emerson (1962), Blau (1964), Thompson (1967); Katz and Kahn, (1966); Levine and White, (1961); Litwak & Hylton, (1961) and Pfeffer and Salancik, (1978). The basic principal of the mode is that organizations operate in turbulent and uncertain environments, over which they try to gain control. Organizations must find ways to ensure comfortable flow of resources from other organizations which control the critical resources. Cook (1977) outlined three strategies: 1) to co-opt the sources of the dependence; 2) to use one’s ties to leverage resources from other organizations; and 3) to make an alter dependent on ego. Once an inter-organizational strategy has been pursued, a network of relations is created that may constrain actor’s subsequent behavior. Contrast to most of the early studies which employed individual organization as the unit of analysis, later resource dependence theories conceptualized the organization/ environment interface in inter-organizational network terms (Benson, 1975; Boje & Whetten, 1981; Rogers, 1974; Mizruchi and Galaskiewicz, 1994:231).

According to Büchel (1996), the resources dependence model (Pfeffer and Salancik, 1978) stipulates that organizations are not able to internally generate all the resources and functions required to survive. They must enter into relationships with organizations in their environment. According to this model, relationships are established in order to exercise power over another organization and its resources (Van de Ven, 1976; Aldrich, 1976; Pennings, 1980; Van de Ven and Walker, 1984).

Organizations, in order to gain control over critical resources, may reduce uncertainty through vertical integration or acquisition, and cooperation. Pfeffer and Salancik (1978) proposed six conditions for organizations entering into cooperative arrangements: 1) common interests, 2) interdependence, 3) moderate degree of interaction, 4) existence of barriers of integration, 5) moderate uncertainty and 6) manageable size of the cooperation. Due to the inherent problems connected with inter-organizational relationships, the resource dependence model views the employment of cooperative arrangements as an unstable strategy.

The motivating force promoting organizations to influence, control or exercise power was believed to be resources scarcity. It is assumed that the formation of cooperative arrangements is at the expense of loss of decision-making power and autonomy. To avoid the loss of autonomy through increasing dependency on resources, organizations establish ties with other firms to compensate for the initial loss in autonomy. In cases where relationships cannot be established to compensate for the loss of autonomy, organizations increase the dependency of others. The avoidance, utilization, and development of dependence among firms are seen to be the main factors promoting the development of cooperative arrangement. The resource dependent model regards the establishment and maintenance of cooperative arrangements as a result of changing patterns of resource dependence through the exercise of control. By concentrating on the reduction of environmental uncertainty in order to control resources, this model focuses on the external motivations as the main driving force of development to a cooperative arrangement (Toral, 2000:18).

According to the resources-based view of the firm, it is resources instead of products which define the competitive position of a firm (Wernerfelt, 1984; Barney, 1991). Additionally, the model suggested that firms with superior capabilities and /or organizational structures are profitable because they have lower costs or offer higher quality of product performance rather than they engage in strategic investments which may deter entry and raise prices above long-run costs. The focus of this approach is on the rents accruing to the owner's scarce firm-specific resources rather than the economic profits from product market positioning (Teece, Pisano and Shuen, 1990).

Discussions concerning this issue included terms distinctive or firm-specific resources (Hitt and Ireland, 1985), core competence (Prahalad and Hamel, 1990), core capabilities (Leonard-Barton, 1992 and 1995) or strategic assets (Dierickx and Cool, 1989). Barney (1991) included all assets, capabilities, organizational processes, firm attributes, information, knowledge etc. as firm resources. The above-mentioned authors postulate that "firms develop internal capabilities or knowledge over time, which enable them to produce superior products. The unique aspect of such a perspective is its long-term orientation. The development of core competencies or capabilities is a long-term investment, which results in improved performance in the future. Competencies are an interrelated mix of organizational knowledge, which leads to an increase in the problem-solving capacity of an organization. It is the unique set of strategically relevant organizational knowledge, which eventually leads to increased returns for a company" (Prahalad and Hamel, 1990).

Several criteria provided by the resource-based view of the firm indicate the necessary conditions for sustainable competitive advantage. It postulates that in order to obtain a competitive advantage, strategic assets must have four attributes. They must be: 1) valuable, 2) rare, 3) difficult to copy, and 4) strategically difficult to substitute. Core competencies and value-creating disciplines are not distributed equally among firms which constitutes an additional explanation for strategic alliance occurrence. Firms

must seek for resources that enable them to share costs and risks from other companies in order to improve their strategic position, (Eisenhardt and Schoonhoven, 1996). Strategic alliances may be effecting a partial redistribution of skills among partners (Prahalad and Hamel, 1990).

“The distinction between acquiring skills in the sense of gaining access to them and actually internalizing a partner’s skills has seldom been clearly drawn. As long as a partner’s skills are embodied only in the specific outputs of the venture, they have no value outside the narrow terms of the agreement. Once internalized, they can be applied to new geographic markets, new products, and new businesses. For the partners, an alliance may be not termed as quasi internalization, but rather a mechanism for actually acquiring a partner’s skills - de facto internalization. This process of knowledge acquisition occurs through learning” (Toral 2000:18).

2.2.4 Game Theory Perspective

Compared to transaction cost perspective, the game theory focuses more on the earnings of a cooperation (Bircher, 1998).

According to Büchel (1996: 46-58), in terms of game theory, cooperative arrangements are best explained by the prisoner’s dilemma (Axelrod, 1984; Jarillo and Ricart, 1987; Nielsen, 1988; Gulati, Khanna and Nohria, 1994). In the game, the two players have to decide whether or not to cooperate with each other in the absence of any direct or indirect information, (since neither can be aware of what the other will do).² “The dilemma exists because the individual behavior leading to optimal *joint* payoff does not result in the optimal *individual* payoff. If each player tries to maximize his or her individual payoff, then neither will win. If one player maximizes the individual payoff by not cooperating while the other cooperates, then the non-cooperative player achieves the highest payoff. If both players cooperate then they will jointly achieve the maximal payoff.” According to Axelrod (1984), individuals or organizations pursue their own self-interest in absence of a central authority, forcing them to cooperate.

The basic idea behind the game is that the payoffs that a firm gets in joining a cooperative arrangement depend on both firms’ actions (Gulati, Khanna and Nohria, 1994:62). Partners are not likely to cooperate because of the attraction of an optimal individual payoff. The reason why firms still engage in cooperative arrangements are because of their expectation of getting more out of a cooperation than if they do not cooperate. Axelrod (1984) believes that the dilemma that the individual payoff is higher in situation of defection can only be solved in repetitive rounds of playing to make players realize that the benefits of cooperating exceed the costs. “In situations of repetition, game theory explains the existence of trust independent of social norms, relationships, or goal congruence. In iterative games with interdependent outcomes, trust is built through multiple positive outcomes. The assumption underlying the explanation of cooperating from an economic perspective is that careful analysis before the decision to cooperate is the most critical success factor” (Contractor and Lorange, 1988; Axelrod, 1984). Game theory views the strategic choice of players as the primary determinants of success in alliances and proposes that the choice for

² The game builds on the assumption that the outcome of the choices is unknown, each player chooses independently and the game is played more than once (Sydow, 1992: 1997)

potential payoffs is the crucial factor in the development of cooperative arrangement (Toral 2000:17).

2.2.5 NW Perspective

Fritz Roethlisberger (1977) considered that organizations and their behavior were such “elusive phenomena” that one could never hope for a definitive theory in the field. All that one could expect was the benefit of a perspective or a framework that could be used as a “walking stick” to support and navigate one’s inquiry through the treacherous terrain of organizations. In responding to that, Nohria (1992:3) suggested “a NW perspective is a particularly sturdy walking stick that is likely to hold up well in our intellectual inquiry of organizations.”

The notion that the NW organization is more suitable for conditions of uncertainty, ambiguity, and risk is actually not new. Burns and Stalker (1961) argued that in unstable environments, an “organic” organization comprised of a complex NW of ties is more effective than the bureaucratic organizational form. In addition, many organizational theorists explain the strategic conduct of organizations in creating alliances among them as being strategic responses to mitigate and manage competitive uncertainties and resource interdependencies (Pfeffer, 1972; Pfeffer and Nowak, 1976).

According to Nohria (1992), the explanations of strategic alliances as an effective response to conditions where transaction costs cannot be easily conducted through market contracts, pay little attention to how these alliances interconnect to bind the firms into a NW of relationships. These explanations also ignore how the network of relationships that emerges over time because of alliances between firms’ shapes and constrains the strategic conduct of firms involved in them.

To illustrate the Make-or-Cooperate decision in the context of an industry NW, Kogut, Shan, and Walker (1992: 349), demonstrated that the particular alliances that firms establish over time are a function of their position in the network of relationships in previous periods. Consequently, the decision to cooperate is shaped by, and in turn shapes, the network of relationships in the industry.

Powell and Barantley (1992:387) tried to add some texture to NW analysis by suggesting that NWs “are particularly well suited for rapid learning and flexible deployment of resources.” As Nohria (1992) commented, “they raise the interesting possibility that the overall NW defines a stable ecology that operates as a learning system; hence the conduct of firms in the biotechnology industry must be understood within this framework.”

According to Gomes-Casseres (1994), the arising of NWs alliances exists because of the influence of the global economy and the dramatic changes of new technologies and market demands. Factors favoring the formation of alliance groups include the growing complexity of products, services, their design and production. It is neither possible nor desirable to find and assemble all the assets possessed by different parties under a single roof. The greatest advantages of specialization and of scale are often realized at the component rather than at the system level. Companies may do best to focus on the component level while forming ties to one another in order to manage system-level interdependence. Companies have created NWs of alliances in order to command competitive advantages that individual companies or traditional two-company alliances cannot. Gomes-Casseres (1994) further explained the distinct advantages of NWs in three kinds of situations. First, NW competition is growing in battles over technical standards, and the outcomes often depend on the number of

companies adopting each technology. Alliance NWs can help contending companies promote their technologies and gain the critical mass required to persuade more businesses to use their design. Second, the increasing importance of global scale has created a fertile ground for NWs. Linking with local companies in various markets helps a company spread its costs over larger volumes or give it access to skills and assets in different nations. Third, new technologies are creating links between industries that are formally separate. “NWs allow specialists in each field to cooperate and exploit new opportunities much faster than if each were to try to acquire the industry-specific skills and assets of the others.”

According to Piore and Sabel (1984), Miles and Snow (1986), Child (1987), Drucker (1990) and Eccles and Nohria (1992), the emergence of the NW organization were necessitated by the conditions of unprecedented knowledge intensity, uncertainty, ambiguity, and risk. To respond to these conditions, firms have to be action oriented - rapidly bringing people and resources together to address opportunities and threats as they arise. This calls for replacing traditional bureaucratic approaches to organizations with more adaptive, self-designing, NW organizations (Nohria and Eccles, 1992). Jarillo (1993) suggested that the only way for companies is to organize themselves into strategic NWs, by which, companies set up a web of close relationships that form a veritable system geared to providing products or services in a coordinated way.

The NW form is designed to handle tasks and environments that demand flexibility and adaptability. A NW organization can flexibly construct a unique set of internal and external linkages for each unique project. Contrasting to a bureaucratically fixed set of relationships for problems processing, the NW organization molds itself to each problem. It adapts itself not by top management decisions but by the interactions of problems, people, and resources - organizational members autonomously work out relationships. “The NW organization is a market mechanism that allocates people and resources to problems and projects in a decentralized manner” (Baker, 1992). This self-adaptability feature led Eccles and Crane (1988) to call the NW form a “self-designing” organization.

Continuing, to explain the increased interest in the concept of NWs in both academic and business arenas, Nohria (1992) summarized three major reasons: the first reason is the **new competition** as labeled by Best (1990). Contrasting the large hierarchical old model organizations, the model of organization with characteristic of the new competition is a NW of lateral and horizontal inter-linkages within and among firms. The competitive success of the new competition has led to an increased interest in NWs. Established firms are now trying to restructure their internal organizations along the line of NWs (Mills, 1990). They are also trying to redefine their relationships with other firms; instead of arm’s-length, competitive relations, they are seeking more collaborative relations that will bind them together into a NW (Cash and Konsynski, 1985; Miles and Snow, 1986 and Powell, 1987). The second reason is **technological developments**. New information technologies have made possible an entirely new set of more desegregated, distributed, and flexible production arrangements and new ways for firms to organize their internal operations and their ties to the other firms. The emergence of manufacturing and telecommunications NWs has led to a concomitant interest in the organizational NWs that these new technological development may spawn (Applegate, Cash, and Mills, 1988; Child, 1987; Drucker, 1988,1990; Malone and Rockart, 1991; Nolan, Pollock, and Ware, 1988, 1989; and Hiltz and Torhoff, 1978). The third reason is the **maturing of NW**

analysis as an academic discipline. “NW analysis has grown from the esoteric interest of a few mathematically inclined sociologists to a legitimate mainstream perspective. This development was spearheaded in the 1970s by Harrison White and his affiliates, who developed a formal apparatus for thinking about and analyzing social structure as NWs.” White’s work attracted and spurred several other scholars to produce a richer NW approach to studying social structure, including theoretical and methodological tools that could be applied to several substantive areas (Alba, 1981 and Burt, 1980,1982). Further development included new journal on social NWs, the publications on NW and structural analysis, and the NW perspective’s adoption and dissemination through articles in leading journals of sociology and organizational behavior (Wellman, 1988). Nohria, (1992) concluded, “today interest in the concept of NWs is no longer restricted to a small group of sociologists. It has expanded to include students of organizations in such applied, interdisciplinary settings as business schools”

With an objective to provide focus and coherence to the NW perspective, Nohria and Eccles (1992) edited a volume of NW studies from scholars who were in various ways using the NW perspective and showing how to apply it to the study of organizational phenomena. The core features of a NW perspective on organizations was described by Nohria (1992) in five basic premises: 1) **“all organizations are in important respects social NWs and need to be addressed and analyzed as such.”** From a NW perspective, the structure of any organization must be understood and analyzed in terms of the multiple NWs of relationships in the organization and how they are patterned - singly and in various combinations; 2) **“an organization’s environment is properly seen as a NW of other organizations.”** Namely, a NW perspective on organization-environment relations pushes beyond abstract notions of environmental uncertainty, resource dependencies, and institutional pressures. It seeks to locate the precise source of these environmental forces by analyzing the pattern of relationships among the organizations that make up the environment; 3) **“The actions (attitudes and behavior) of actors in organizations can be best explained in terms of their position in NWs of relationships.”** From a NW perspective, variations in the actions of actors (and the outcomes of these actions) can be better explained by knowing the position of actors relative to others in various NWs of relationships. It may be more predicative of the conduct and performance of an organization by knowing the structural autonomy it enjoys in its transaction NWs than by knowing their attributes like relative size and technological capabilities (Burt, 1980a, 1983); 4) **“NWs constrain actions, and in turn are shaped by them.”** NWs are as much a process as they are a structure, being continually shaped and reshaped by the actions of actors who are in turn constrained by the structural positions in which they find themselves” and 5) **“The comparative analysis of organizations must take into account their NW characteristics.”** Nelson (1986:75) made remarks that most of the traditional comparative research “does not deal directly with the NWs of relationships which make up organization structure. Rather researchers establish variables that are generalizations about these relationships. The major problem with such variables is that they do not reveal the actual configurations of relations which comprise structure.” “The conclusion was that a NW perspective, pushes for comparisons in terms of variables and measures that reflect the overall structure of relationships in the organization, eschewing variables and measures that are generalizations of the pattern of dyadic interactions in the organization” (Nohria, 1992).

2.2.6 Summary

Different theoretical explanations concerning cooperation between and among firms have been presented in the preceding sections. The multiple theoretical presentations provided varied explanations on the basic reasons and rationales of firms forming strategic alliances which are generally applicable to the first research question addressed in this dissertation.

- **The principal agency theory** incorporated a perspective of cooperative structure between principal and agent – firms engage in cooperation because that outsourcing functions gives possibility to turn internal relations into external relations. In a NW structure, more transactions are based on “at arms’ length” transactions, assuring better control than within a hierarchy

- **The transaction cost perspective** had a focus in the costs of coordination – firms forming NW alliances when the cooperative structure is able to function more efficiently, with lower TCs, than markets or hierarchies - the objective of forming alliance being cost minimization

- **The resource dependency perspective** concentrated in the degree of resource dependence of organizations and in the environmental adaptation they needed to survive - firms engaging cooperation because they could not generate “enough” resources and functions required to survive. Therefore, they must enter into cooperation with other organizations in their environment

- **The game theory perspective** emphasized potential future payoffs - firms engaging cooperation when managers realize that competitive behavior tends to worsen the situation of each of the players (mature industries, cartelistic situations). The position vis-à-vis the customers may be better in case of cooperation

- **The NW perspective** analyzed the pattern of relationships among the organizations and their ability to respond to the various internal and external conditions that impact organization’s performance. Companies have created NWs of alliances in order to command competitive advantages and to respond to the changes in the competitive environment which individual companies or traditional two-company alliances cannot. NWs allow specialists in each field to cooperate and exploit new opportunities much faster than if each were to try to acquire the industry-specific skills and assets of the others.

The following section synthesizes research in the NW area. The presentation focuses on providing an overview of NWs including their evolutionary characteristics and various types of NW form organizations. The objective is to highlight the key attributes of the NW form organization and to determine suitable NW patterns and analytical elements for the empirical part of the research process.

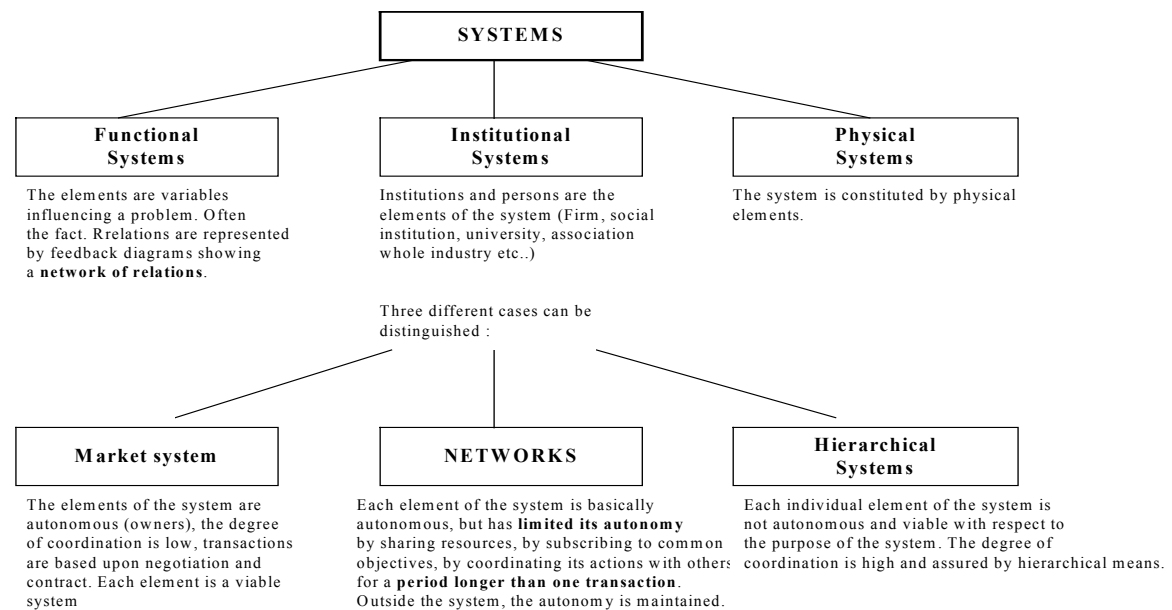
2.3 OVERVIEW OF NETWORKS

2.3.1 NWs and Strategic NWs

“NW is not a new idea. At least since the 1950s, the concept of NWs has occupied a prominent place in such diverse fields as anthropology, psychology, sociology, mental health, and molecular biology in the field of organizational behavior, the concept dates back even further. As early as the 1930s, Roethlisberger and Dickson (1939) described and emphasized the importance of informal network of relations” (Nohria,

1992). Bircher (1998) explained the notion of NWs from a systems view perspective. Figure 4 shows what makes a system a NW.

Figure 4: System vs. NW



Source: Bircher (1998)

(Source: Bircher, B., "A network approach to telecommunications- Introduction" Working paper, 1st draft, September 1998)

According to Bircher, NWs are systems because they are composed of several elements: 1) arranged in a **structure**; 2) existence of **relations** between the elements; 3) existence of common **objectives**. This system develops **activities** and **behaviors** to be attributed to the existence of the NW (rather than to the existence of the elements alone), the NW is embedded in an **environment**, but a boundary separates the NW from its environment. Conclusively, a NW is a system, but not every system is a NW.

2.3.1.1 Definition of Strategic NWs (NWs, strategy and strategic NWs)

1) Networks

Burt and Minor (1983) stated that the main importance of NW definitions are connected to the social relation between the actors who can be individuals, groups, communities, and societies in a social NW. The relations between them can be the exchange of goods, or information (Baker 1992 and Sydow 1992), their **structure** and their **culture**.³ Baker (1992:398) provided a theoretical definition of NW as "a social NW that is integrated across formal boundaries." Interpersonal ties of any type are formed without respect to formal groups or categories. He postulated that the actors or agents be independent members of the NW. A NW of interest is composed of companies. A company in a NW must be an economically and legally independent agent (Wohe 1990).

³ Structure - Sydow (1992) suggests a great number of elements for the classification of a NW's structure (1) Size and pattern of grow, (2) Division of functions and roles, (3) Diversity, (4) Multiplicity, (5) Redundancy, (6) Openness, (7) Formalization, (8) Extension, (9) Competition and (10) Governance Structure. Culture – the culture of an organization is generally classified by its (1) Values, (2) Goals, (3) Expectations, (4) Image and Identity, (5) Cohesion (6) Level of conflict (Hofstede 1991; Sydow 1992).

Compared to hierarchical organizations, NWs are ‘loosely coupled systems’ while in comparison to purely market-style relations, the NW is a relatively ‘tightly coupled system’ (Granovetter, 1992; Sydow, 1992). The notion of coupling is expressed in relative terms and depends on the point of reference. Sydow (1992:86) defined a loosely coupled system as where the elements interact (1) rather sudden than continually, (2) rather sporadic than direct and (3) rather occasional than immediately influenced. Further, in ‘loosely coupled systems’ disturbances affect only their immediate environment without reaching the entire system.

By cooperating, NW members aim at individual competitive advantages by entertaining complex reciprocal and relatively stable relations. These relations have been built up as a consequence of strategic make/buy decisions and have been fixed mostly by long-term legal arrangement (Baker, 1992; Hedberg, 1996; Jarillo, 1988; Sydow, 1992, Hirsch, 1997). Economical independence is also formally preserved if firms can freely join and leave the NW according to their own desires (Sydow 1992, Hirsch 1997). Bircher (1998) defined institutional NWs as organizations, partnerships, alliances where participants are basically independent and represent viable systems, have agreed on specific common goals, to cooperate for a duration which is longer than one single transaction and under the supervision of one leading firm. The number of participants in a NW is higher, they have a higher degree of heterogeneity and there are many legal forms by which companies are linked together. Furthermore, a NW may be composed of various alliances.

The term “NW” is open to different interpretations. At a 1992 summit of NW experts from around the world, a codified definition was given: “a NW involves a form of associative behavior among firms that helps expand their markets, increasing their value-added or productivity, (and) stimulate learning (to) improve their long-term market position” (Bosworth and Rosenfeld, 1993:19; Schirmer and Taylor 1995).

2) Strategy

In a NW constellation, several partners are involved, and the cooperation refers to **strategic aspects** of business (Bircher, 1998). When adding the notion of ‘strategy’ to ‘NW’, associations such as rationality, pro-activity, importance, etc. are adjoined (Sydow 1992). “Strategy is the sum of decisions and actions concerning the choice of means and resources to attain a goal. Strategy can also be defined by a series of elements. Such as the business mission, the choice of the ‘battlefield’, the complementarity of resources (synergy), the means of action, the tactics, the priorities and the contingency plans” (Thietart 1991; Hirsch 1997:17). Strategy is regarded as the mediating element between the firm and its environment (Sydow 1992). In order to link them coherently, strategy and structure of the system - being the two variable factors of the question- must be arranged to maximize the benefits of the interactions with environment (Mintzberg, 1990; Sydow, 1992). In strategic management, the structure of the company is to be regarded as a function of the defined strategies (Chandler 1962). Simultaneous and interactive elaboration of strategy, organization and human resources arises as new paradigm of strategic management (Mintzberg 1990).

In a strategic NW, the strategies of the individual members are topped by a collective strategy for the NW as a whole (Sydow 1992). These strategies do not have to be identical and conflicts will emerge due to strategic differences (Porter 1985). Strategic management in a NW has to consider both the objectives of the single members and the system as a whole: the managers have to consider external risks and opportunities as well as strengths and weaknesses, particularly the given structure and culture of the

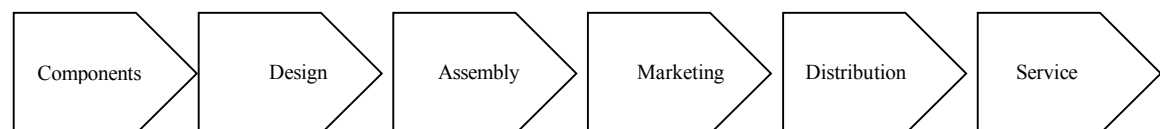
NW, (Porter 1985). The alignment of individual and collective strategy must be the aim of strategic management in the NW. In this context, the strategic NW presents the synthesis of the NW form organizations with the notion of strategy (Hirsch 1997:18).

3) Strategic NWs

Strategic NWs become “long-term, purposeful arrangements that allow those firms in them to gain or sustain competitive advantage vis-à-vis their competitors outside the NW” (Jarillo 1988). The strategic aspect in combination with NW indicates proactive management, targeting those competitive advantages most flexible to marketplace requirements. Strategic NWs aim at maximizing the benefits of the NW as a whole. “It is the basic condition of managing the NW that each partner has to be better off when cooperating and contributing to the NW’s success than abstaining from it” (Jarillo 1993; Joffre and Koenig 1992; Sydow 1992). Therefore, the alignment of individual and collective interests constitutes the main characteristics and tasks of a NW. Strategic NWs contain a collection of complimentary activities (Dussauge and Garrette 1991; Kanter 1994). The NW members belong mostly to different sectors of business. Expectations are valid for companies that have externalized the activities concerned. Some NWs include several complimentary suppliers of the same service or product since (1) they serve other markets, or if (2) they are only connected by the strategic center (Kanter 1994). Furthermore, “a strategic NW acts more purposely than its ‘regular’ equivalent with explicitly defined goals and strategies. It is also more likely to have a stable system of roles” (Sydow 1992).

The NW as a whole constitutes a business system which is also titled “the value chain” following Porter’s (1985) concept of series of activities performed by a company. “The value added chain” consists of several complementary activities performed by different parties of which is adding value to the whole in order to produce or to provide a service (Jarillo 1993), Figure 5 shows an example of a value chain in the computer industry.

Figure 5: Business System of the Computer Industry



Source: Jarillo, J. C., “Strategic Networks: Creating the borderless organization” p. 24

Finally, in an adaptation of various definitions presented from the literature, a strategic NW, within the context of this dissertation, is defined thusly:

“A strategic NW is - a strategically aimed, flexibly connected and coordinately managed cooperative arrangement among more than two multifunctional institutions with interdependent relationship of complementarities; operating to attain a common NW objective which add value to individual interests of all participants”.

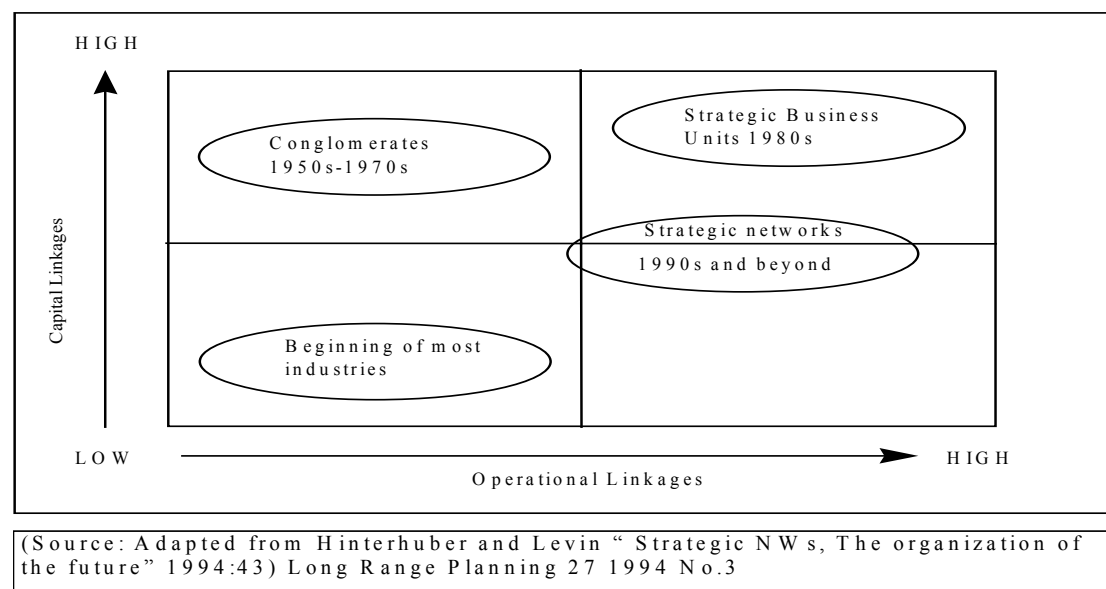
This definition therefore excludes cooperative arrangements including non-strategically aimed, one time transaction oriented, and cooperation between two partners. The terms “strategic NWs”, “NWs” and “NW organizations” and their corresponding abbreviations are synonymously used throughout this dissertation.

Having now defined strategic NWs, the coming section presents the literature concerning the developmental aspects of the strategic NWs. The objective of next section is to obtain an overview of the evolutionary process of this particular form of cooperative arrangement from its organizational roots and operational rationale.

2.3.1.2 Organizational Roots and Development of Strategic NWs

“All known NW organizations evolved unplanned or resulted from the redesign of a non-NW organization” (Baker, 1992:389). “Over the last century, companies have been trying many forms of organization. They passed the classical functional to the divisional and finally the matrix form of organization” (Miles and Snow 1992). Hinterhuber and Levin (1994) elaborated the evolutionary development of enterprises from uncontrolled chaos to a coordinated NW of competence-focused units. Figure 6 illustrates this evolutionary process.

Figure 6: The Evolutionary Development of Industries



According to Hinterhuber and Levin (1994), that starting from the beginning, many small firms exist in an ‘unplanned NW’ - competing with each other and existing because of each other at the same time. After experiencing more aggressively competition and a shake-up and having achieved a maximum size and faced with maturing markets, the few remaining firms diversify to create conglomerates. In the 1970s and 1980s, these companies shed their non-core businesses and reorganized themselves along focused strategic business units. Strategic business units are run from the center with a considerable degree of operating freedom. This however facilitates a further break with the center, manifested by a wave of management buy-outs or establishment of new firms in some industries in the late 1980. This in turn has facilitated downsizing; broken away from the larger units, the firms start to shed the activities that still impede concentration on their core competencies and establish relationships with other firms buying their non-core functions. Further, according to Hinterhuber and Levin, the nineties marked the return of ‘small unit thinking’, for

example, IBM⁴ was broken up into smaller units focused on their market segments with minimum control from a significantly reduced headquarters. The authors further argue that a NW formed between smaller or mid-size firms can be superior in most aspects to a large firm because on one hand, by staying small, it would enjoy all the advantages of a lean, fast, and extremely flexible unit, and on the other hand, a NW has the same advantages of scale as a larger competitor by being able to constantly correct, adjust, or change itself so as to maintain its superiority over time, since “it is much easier to build something from small parts than to break up a large ‘block’ into small units” (Hinterhuber and Levin, 1994).

Having presented the relevant literature explaining the organizational roots and development aspects of strategic NWs, the following section will introduce the literature concerning different types of NWs.

2.3.2 Types of NWs

A social NW is “a set of nodes (e.g., persons, organizations), linked by a set of social relationships (e.g., friendship, transfer of funds, overlapping membership) of a specific type” (Laumann et al. 1978:458). “The premise that organizations are NWs of recurring relationships applies to organizations at any level of analysis - small and large groups, sub-units of organizations, entire organizations, regions, industries, national economies, and even the organization of the world system” (Lincoln, 1982:26). Following Laumann et al. and Lincoln, Nohria (1992) argued, “**all organizations are in important respects social NWs and need to be addressed and analyzed as such.**” In a same context, Ibarra (1992:66-171) emphasized many types of informal or ‘emergent’ relationships based on friendship, advice, or conversational relationships within and across an organization’s formal boundaries are as important as the formal or prescribed relations in understanding NWs in organizations. From a NW perspective, the structure of any organization must be understood and analyzed in terms of the multiple NWs of relationships in both prescribed and emergent organizations and how they are patterned. There are many different types of social NWs.

Wasserman and Faust (1994) categorized NWs by the nature of the sets of actors and properties of the ties among them and defined the **mode** of a NW as the number of set of entities on which structural variables are measured. One-mode NWs, the predominate type of NW, study just a single set of actors, while two-mode NWs focus on two sets of actors, or one set of actors and one set of events. One could even consider three- (and higher) mode NWs, but seldom have social NW methods been designed for such a complicated data structure.

2.3.2.1 Prescribed and Emergent NWs

Most of the growing interests in cooperative strategies have focused on formal cooperative arrangements, such as JVs, licensing, co-production agreements, and management contracts. However, cooperation may be also informal. A supplier and a

⁴ In comparison with its competitors, IBM is a highly vertically integrated company in possession of a large part of its value-added chain, high integration results in a large asset-base (50-60 percent of sales for DEC and IBM) and thus in low flexibility and inability to focus on the essential. In contrast, both Apple and Dell concentrate on their competencies and possess a relatively small asset-base (some 20 percent of sales).

customer may engage in a lasting, mutually advantageous relationship (Webster, 1979; Levitt, 1983). Two complementary suppliers may cooperate informally when entering new markets. According to Hakansson and Johanson (1992), study of cooperative relations between firms in technical development shows that more than two-thirds of the cooperative relations were informal.

In an attempt to better understand managerial action, Ibarra (1992) explored connections between structural context of prescribed and emergent patterns of interaction, and individual strategies for making use of those structures. Prescribed NWs are composed of a set of **formally specified relationships** between superiors and subordinates and among functionally differentiated groups that must interact to accomplish an organizationally defined task. Prescribed NWs also encompass the set of relationships created by committees, task forces, teams and dotted-line relationships that are formally sanctioned by the firm but more fluid than relationships represented by the organizational chart (Schoonhoven and Jelinek 1990).

“**An emergent NW**, on the other hand, involves **informal**, discretionary patterns of interaction where the content of the relationship may be work related, socially related, or combination of both. Emergent NWs develop out of the ‘purposive action of social actors who seek to realize their self-interests, and depending on their abilities and interest, will negotiate routinized patterns or relationships that enhance these interests’” (Galaskiewicz 1979:16; Ibarra 1992:107).

“Many organizational scholars argue that it is informal or **emergent** NWs of relationships that account for regularities in day-to-day work, distinguish effective from ineffective individuals and groups, and generally provide key channels for the business of getting things done” (Powell 1990). “...Informal NWs are indispensable to organizational functioning, and managers must learn to manipulate them for organizational ends” (Lincoln 1982:11). “A wealth of managerial research (e.g., Kanter 1983, 1989; Kotter 1982,1985) has suggested that patterns of informal NW interactions play an important role in facilitating the achievement of desired individual and organizational outcomes” (Ibarra, 1992). Lincoln (1982) has argued, “Formal structure is at best a highly idealized image of organizational reality. At worst it is pure ideology, bearing little direct relation to internal organizational NWs.” Hakansson and Johanson (1988) have explained three reasons in emphasizing the importance of the informal cooperation between partners: 1) formal cooperation is more visible to other actors both from within the cooperating firms and without. 2) Informal cooperation is based on trust developed through social exchange instead of business exchange. The informal cooperation evolves as a consequence of growing awareness of mutual interests develops, which takes time and resources. The parties invest in the relationship with each other. Informal cooperation implies that visibility comes before the business if trust can be developed. Formal cooperation does not often lead to real cooperation, which is often not visible; 3) informal cooperation is usually developed by line managers on the middle-management level, formal cooperation is usually entered into on a higher- management level.

“Formal and emergent NWs coexist, and each can be best understood in the context of the other” (Monge and Eisenberg 1987:309, Ibarra 1992:107). Several researchers have emphasized the interdependence of formal and informal structure (Stevenson 1990; Shrader, Lincoln, and Hoffman 1989; Kadushin and Brimm 1990; Ibarra 1992:107).

Ibarra (1992) emphasized: “a core thesis is the notion that the action potential of organizational systems is highly contingent on the degree of overlap or alignment

between prescribed and emergent NWs that are tightly or loosely coupled.” “Loose coupling is defined by a situation in which elements are responsive, but retain evidence of separateness and identity (Weick 1979) or by systems that either have few variables in common or have in common variables that are weak.” “A state of loose coupling, would entail highly disjointed formal and emergent structures, or structure operating to accomplish highly differentiated tasks, sometimes even at cross-purpose” (Orton and Weick 1990). But as clarified by Orton and Weick (1990), “loose coupling is a multidimensional concept: organizations contain interdependent elements that vary in the number and strength of their interdependencies.” These writers argue that researchers should search for simultaneously occurring patterns of tight and loose coupling: “What elements are loosely coupled? What domains are they coupled on? What domains are they decoupled on? What are the characteristics of the couplings and decoupling?” (Orton and Weick 1990:219). According to Granovetter (1992) and Sydow (1992) that compared to hierarchical organizations, NWs are ‘loosely coupled systems’. When compared to purely market-style relations, the network is a relatively ‘tightly coupled system’.

Ibarra proposed that the relationship-contents of NWs are relevant domains for the exploration of patterns of coupling and decoupling and that three types of NWs are frequently distinguished: **workflow**, **influence**, and **expressive** relationships (Brass 1984; Pfeffer and Salancik, 1978; Tichy, Tushman, and Fombrun 1974; Fombrun 1982). Ibarra (1992:172) finally summarized, that prescribed and emergent NWs may overlap in workflow, and in influence, or in both; expressive NWs may overlap to varying extents with other NWs. These various types of NWs may perform varied functions depending on the types of organizational systems. “The degree and mode of alignment between prescribed and emergent NWs structure the allocation of valued resources, thus regulating opportunity for action” (Kadushin and Brimm 1990).

2.3.2.2 Workflow, Communication, and Friendship NWs

According to Brass and Burkhardt (1992), three social NWs 1) workflow NW 2) communication NW and 3) friendship NW correspond to three of the basic flows noted (Tichy, Tushman, and Fombrun, 1979): 1) exchange of goods, 2) exchange of information or ideas, and 3) affect or linking.

Workflow NW “involves the flow of resources, such that B exchanges the resources obtained from A with another partner, C. Obtaining resources (inputs necessary for job performance) from A enhances B’s exchange with C (outputs from B become C’s inputs)” (Yamagishi et al. 1988; Brass and Burkhardt 1992:199). Although informal patterns of behavior can occur in a workflow, this NW is formally prescribed. Even when accounting for informal modifications, the workflow represents a highly restricted interaction NW. Within the workflow NW, the basis for interdependencies among workers is established by the division of labor, workers performing parts are dependent on one another. As the workflow through the organization, workers exchange inputs and outputs. The relevant outcome is the performance of one’s task, which continues the successful flow of work.

Communication NW, interdependencies among people in communication NWs are based on the exchange of information. Likewise, the relevant resource is information. Employees who are centrally located in the communication NW have potential access

to and control over information and thus are potentially powerful (Pfeffer 1981; Mechanic 1962; Freeman 1979).

Friendship NW, employees in organizations are also linked together socially or through friendship. In such a NW, friendship may be instrumental in obtaining other relevant resources such as information or rewards. Friendships may also be the bases for forming coalitions, although it is equally likely that coalition partners may develop friendships. Regardless of the direction of this relationship, the overlay of friendship on work relationships may make it difficult for friends to withhold valuable information or join opposing coalitions. To the extent that friendships are instrumental in acquiring information, it is expected that overlaps between centrality and power with the communication NW occur (Nohria 1992).

2.3.2.3 NW Organizations

The emergence of “NW organization” was documented by a growing body of research as a distinct structural form that is neither market nor hierarchy. NW organizations are described and characterized by lateral horizontal patterns of exchange, interdependent flows of resources, and reciprocal lines of communication (Powell 1990; Nolan, Pollock, and Ware 1988). According to Powell (1990), NWs are more flexible and effective than hierarchies in responsiveness to changing conditions: new information is easily disseminated, interpreted, and acted on without the constraint of passing information or searching for resources up and down a hierarchy. Miles and Snow (1994:56-57) called the NW organization a new way of packaging of strategy, structure, and process. The new form eschews the traditional ingredients of corporate success such as “do everything yourself”. It does not call for complete vertical integration or tall management hierarchies. Instead, the newest form of organization relies on ingredients such as value-chain location based on core competencies, strategic alliances, outsourcing, and - wherever possible - the substitution of market forces for hierarchical controls.

2.3.2.3.1 Learning, Resource, Co-marketing and Co-production NWs

Bosworth and Rosenfeld (1993:19) suggested that the term “network” is open to different interpretations. “Firms might cooperate with one another in several ways of arrangements such as learning NWs, resource NWs, co-marketing NWs and co-production NWs. These types of NWs are listed in ascending order that reflects the level of trust and cooperation necessary for success. Learning NWs and resources NWs are known as ‘soft NWs,’ since these types of NWs do not require the more formalized relationships of co-marketing or co-production NWs, which are known as ‘hard NWs.’ Firms typically begin to work in soft NWs, which require less effort and less commitment, and as trust and cooperation develops, they may move towards hard NWs. Hard NWs generally yield greater results in terms of sales and competitiveness (Schirmer and Taylor 1995:39-51).

In **learning NWs**, firms share knowledge and experience necessary to remain competitive. For example, a group of companies created an association for reducing cost. The group is examining inventory programs, scrap reduction, team approaches to management and trash disposal reduction cost. The association is also developing a plan for members to purchase office suppliers as one large unit (Friedberg, 1995).

In **resource NWs**, firms develop solutions to common problems or spread expenses for insurance, certification, training, equipment or testing. For example, a number of German small-and-medium-sized engineering and metalworking firms (which were under competitive pressures from other European firms and rising quality standards of large manufacturers) decided they need to improve their production quality, but *individually* they could not afford to purchase the necessary equipment. Instead, they bought a single set of the very best equipment on the market *collectively*, and housed it at an independent technology center (Pyke, 1994).

In **co-marketing NWs**, firms employ joint marketing - gaining access to new customers and new markets. These types of NW require firms to become interdependent and necessitate higher levels of trust. These NWs are quite common. For example, in Great Britain a NW of printers publishes a comprehensive brochure that describes the capabilities of 10 member firms. In the brochure the firms' products were not overlapped, so that no two companies provide the same services in the brochure. The NW members share customer databases with one another and sometimes engage in joint contract work, - enabling them to secure larger contracts than they could individually (Broun, 1994b).

In **co-production NWs**, firms jointly manufacture components or finished goods, complementing one another's operations. In this type of NW firms not only market their goods together, but they also produce them together. Another example, in Iowa, of a NW was formed by several dozen cow-calf producers, an area feedlot operator and a beef packer. The feedlot operator and beef packer exchange information with the producers, enabling greater quality control in the production process and producing more consistent and flavorful beef (Borst, 1995).

A NW might consist of firms which produce similar products, or firms which produce different stages of the same final products, or a NW may consist of firms in different industries cooperating to share information about new business practices and how to solve common problems (Schirmer and Taylor 1995:39-51).

2.3.2.3.2 Dispersed, Concentrated and Multi-centered NWs

Other types of NWs termed as Stars, Rings and Tiers separately describing Dispersed NWs, Concentrated NWs and Multi-centred NWs by Liu and Brookfield (2000). Dispersed NWs and concentrated NWs represent different configurations of lead-firm supplier NWs. Multi-centered NWs are collections of small enterprises most often devoted to the production of parts and system subassemblies. In a multi-centered NW, for a given part or order, a particular firm will act to coordinate production. Because such a NW will often produce a number of parts for a variety of different customers, the hub firm will change for different products.

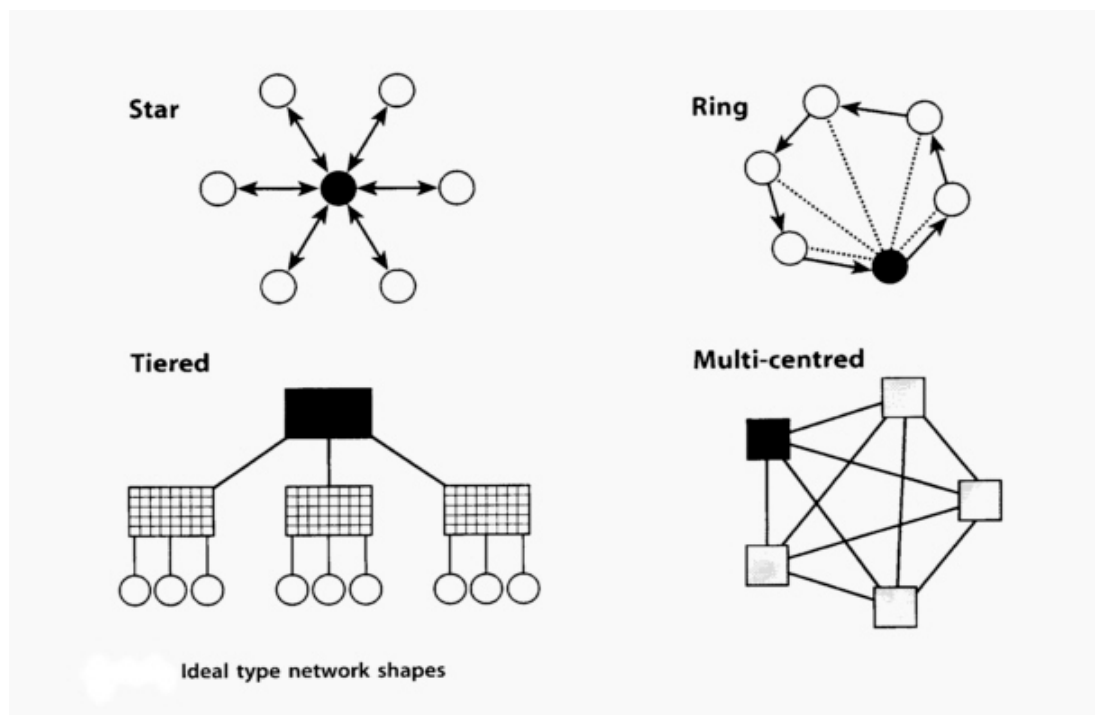
Dispersed NWs generally take on one of two forms. The first is a star-like structure. The second is a ring-like form which, when seen from a materials flow perspective, has the suppliers orbiting the lead manufacturer like planets - usually with informational rather than material ties to the central firm. Most dispersed NWs begins as star structures with orders for parts being organized by the lead manufacturer and parts then routinely flowing back to the central company before additional processing. Ring-like structures begin to emerge as the supply NW is rationalized. Rather than having parts and assemblies constantly returning to the lead firm, parts flow directly

from one subcontractor to the next. This simplifies logistics even as it reduces the lead firm's control.

According to Liu and Brookfield (2000), **Concentrated NWs** involve a small number of larger firms, each of which tends to undertake a more extensive set of tasks. Concentrated NWs tend to take on a tiered shape. Because with fewer alternatives, lead firms have to maintain good relations with fewer suppliers. Since there are fewer suppliers, ties among suppliers tend to be cordial. For the concentrated NWs, production volume and processing balance are critical issues. Each production NW has its own conditions for success. Dispersed makers will tend to be found in industrial areas with dense inter-firm ties. They will also tend to supply relatively standard products for the market.

In the **Multi-centered NWs**, according to Liu and Brookfield (2000), there is no single lead firm, and the role of the leader changes depending on the product and order. A Multi-centered NW organization often leads to a very fine division of labor and is conducive to the development of special firms. Moreover, such NWs are very flexible. Given a reasonable amount of cooperation among firms, such NWs can often avoid dissolution by migrating from the manufacture of one product to another according to the logic of product life cycles. Figure 7 presents the three types of NWs.

Figure 7: Star, Ring and Multi-centered NWs



Sources: Star, Rings and Tiers: Organizational NWs and their Dynamics in Taiwan's Machine Tool Industry. Ren-Jye Liu and Jonathan Brookfield (2000)

2.3.2.3.3 Vertical, Horizontal and Diagonal NWs

Hinterhuber and Levin (1994) defined four basic types of inter- and intra- business unit NWs. The first is the **Internal Nws**, which is identical to the internal NWs developed by Miles and Snow (to be presented in the next section).

The second, **Vertical NWs**, Toyota is the best-known example. Benetton has been successful by creating a NW going both vertically up (franchisees) and vertically down (suppliers).

The third, **Horizontal NWs** are these alliances with similar firms in similar markets in order to develop or exploit a particular technology or penetrate a geographical market segment. Some common examples are airline business.

The fourth one, **Diagonal NWs**, according to Hinterhuber and Levin (1994), are of a “fuzzier” variety and reformed between companies trying to exploit synergies in order to create new, interdisciplinary markets. A good example is the American Cable TV giant, TCI, which has established at least eight connections to diverse outfits from software leader Microsoft to Hollywood power broker M. Orvitz (CAA) in order to develop the “information high ways” in the US. Figure 8 shows the four types of NW as defined by Hinterhuber and Levin (1994).

Figure 8: Types of NWs and their Orientation

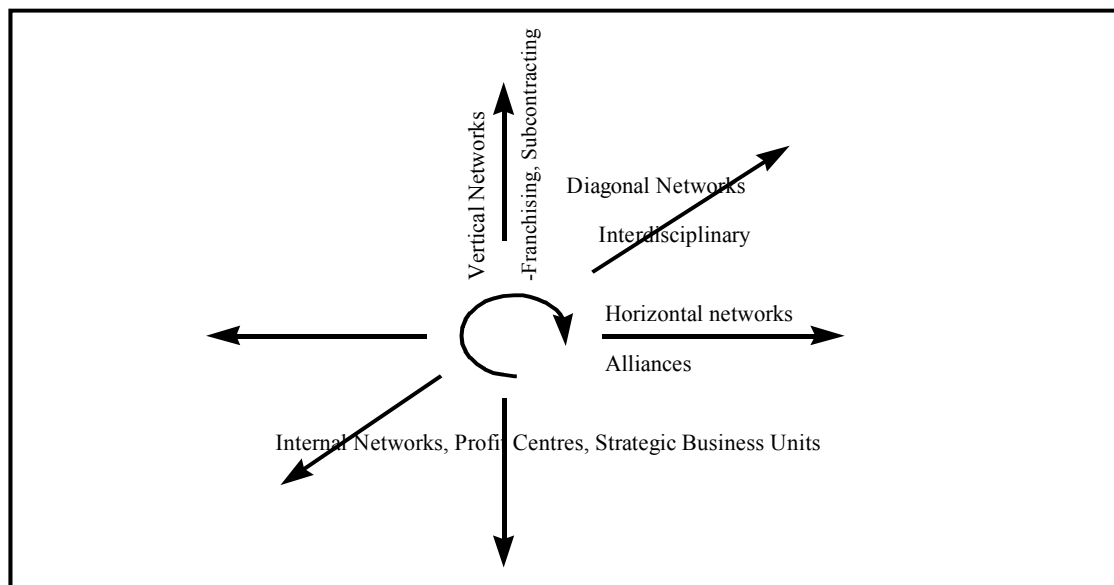


Figure 8: Types of networks and their orientation., Hinterhuber and Levin (1994)

(Source: Hinterhuber and Levin “Strategic NWs, The organization of the future” 1994:43)

2.3.2.3.4 Internal, Stable and Dynamic NWs

Miles and Snow (1994) have categorized hundreds of examples into three generic NW forms (dynamic NWs, stable NWs, and internal NWs) and provided a relatively exhaustive explanation, as presented below.

Dynamic NWs emerge in settings where rapid changes in technologies and customer tastes, or short time horizons make response time a critical factor in success and make investments in costly, special purpose assets risky. Under such circumstances, a given firm is likely to focus on a position of the value chain and to forge relationships with other specialist firms to offer the final product or service (Miles and Snow, 1994:59). For the dynamic NW to achieve its full potential, there must be numerous firms (or units of firms) operating at each point along the value chain, ready to be pulled together for a given product or venture and then disassembled to become part of another strategic alliance. For the businesses which need extensive outsourcing, the lead firm identifies and assembles assets owned largely (or entirely) by other

companies. Lead firms themselves rely on only a limited set of core competencies. Many dynamic NWs are found in the computer industry. For example, Dell Computer Corporation's strengths are in customer-driven technology, marketing, and service. In less than a decade, Dell has made huge inroads into the PC market against larger and better-known competitors such as IBM, Apple and Compaq. Dell's organizational arrangement relies heavily on the rapid formation and utilization of key strategic alliances.

The operating logic of the dynamic NW is linked to that of the **divisional form** of organization. The combination of central evaluation and local operating autonomy is reflected in the dynamic NW, in which a lead firm links together independent firms (in alliances of greater or lesser degrees of permanency) to design, manufacture, and sell a particular product or service. Thus, the operating logic of the Dynamic NW is partner-firm independence coupled with the lead firm's overall vision.

The potential causes of failure in the dynamic NW, according to Miles and Snow (1994), is that if a particular firm in the value chain overspecializes - refines while also restricting its expertise it runs the risk of becoming a "hollow" corporation - a firm without a clearly defined, essential contribution to make to the NW. Firms need to occupy a wide enough segment of the value chain to be able to test and protect the value of their contribution. Their upstream and /or downstream neighbors can easily overrun firms with a contribution base that is either too narrow or too weakly defined.

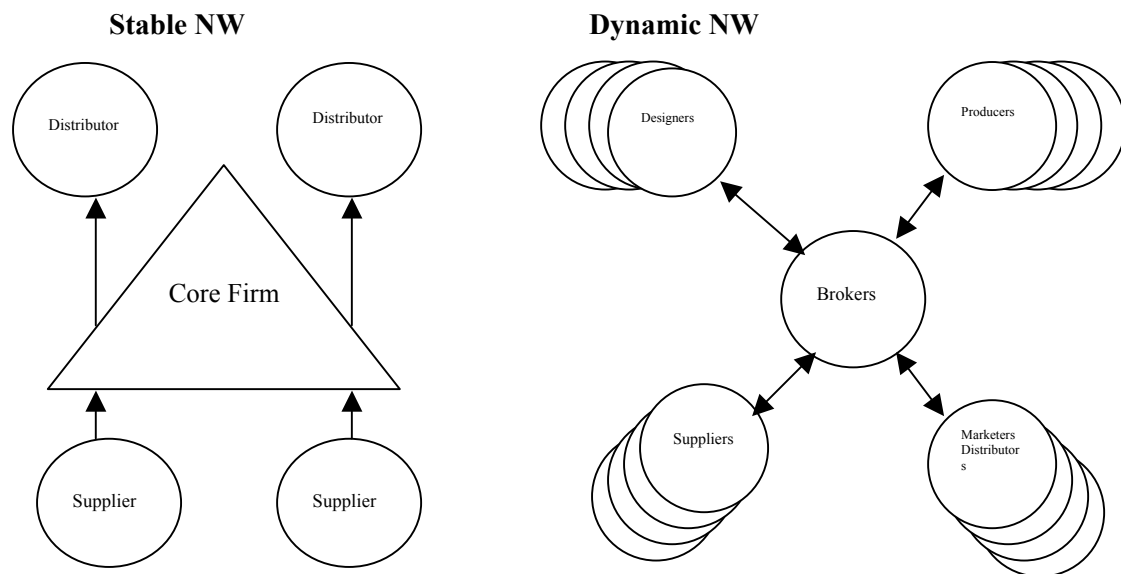
Stable NWs, according to Miles and Snow (1992:63; 1994:59), have their roots in the structure and operating logic of the **functional organization**. It is designed to serve a mostly predictable market by linking together independently owned, specialized assets along a given product or service value chain. This type of NW tends to appear in mature industries with somewhat predictable market cycles and demands. Very often stable NWs form around a few large, key firms for which NW partners provide either upstream services, such as the supply of parts and components, or downstream services such as distribution. Instead of a single vertically integrated firm, the stable NW substitute asset of component firms, each tied closely to a "core" or "lead" firm by contractual arrangements, but each maintaining its competitive fitness by serving firms outside the NW. These clusters of firms interact regularly, and their relationships are more limited and predictable and they develop standardized interaction routines.

"The operating logic of the stable NW is that the total NW can be thought as a set of assets dedicated to a given business. The lead firm and each of its upstream and downstream partners have knowledge of each other's abilities and are, in varying degrees, committed to making the entire value chain operate effectively." The stable NW's operating logic is centrally coordinated specialization. However, instead of employing the vertical integration associated with traditional functional organizations, the NW's lead firm outsources its non-core competencies to other specialist firms in order to increase flexibility throughout the NW (Miles and Snow, 1994).

The potential cause of failure in the stable NW according to Miles and Snow (1994) is an extension that demands the complete utilization of the supplier or distributor's assets for the benefit of the lead firm. If several suppliers and distributors focus their assets solely on the needs of a lead firm the benefits of broader participation in the marketplace are lost. Unless suppliers sell to other firms, the price and quality of their output is not subject to market test. Likewise, unless multiple outlets are used the

value actually added by distributors must be set by judgment rather than by market-driven margins. The process of assets over-specialization and over-dedication by NW partners can damage the NW. Deep involvement in a supplier or distributor's processes can occur. The lead firm can ultimately find itself "managing" the assets of its partners and accepting responsibility for their output. Furthermore, when the operating independence of the NW members is severely constrained, any creativity that might flow from its managers or staff is curtailed and the lead firm does not get the full benefit of the partner's assets (Miles and Snow, 1994). Figure 9 illustrates the stable and dynamic NWs.

Figure 9: Stable and Dynamic NWs



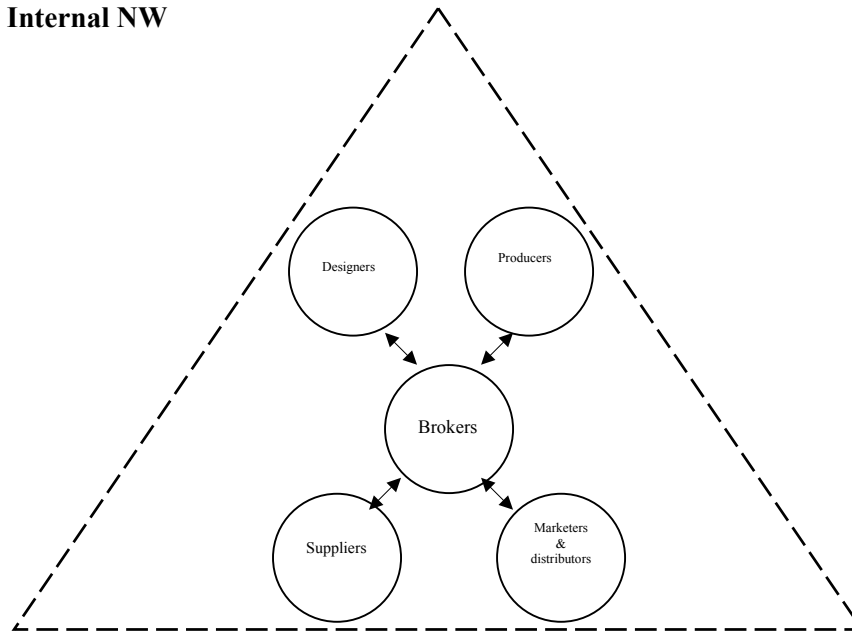
(Sources: Miles and Snow (1992:56) "Causes of Failure in NW organizations" California Management Review)

Internal NWs emerge inside large organizations as resource flows become increasingly unpredictable or costly. According to Miles and Snow (1994), the logic of the internal NW requires the creation of a market inside a firm. Within the INW, a company's various units buy and sell goods and services among themselves at prices established in the open market.

According to Miles and Snow (1994), the operating logic of the internal NW flows from that of the **matrix organization**, namely, a dual focus on products and functions." When a company wishes to operate globally, a third dimension is added to the matrix: markets or regions. As these organizing dimensions accumulate, complexity increases dramatically. However, it is generally acknowledged that a global matrix organization cannot operate effectively if it employs the administrative processes associated with the traditional matrix structure (or the strategic business unit structure). Therefore, instead of attempting to achieve a balance across the three matrix dimensions of products, functions, and markets through plans and hierarchies, some companies form INWs in which decisions and resource allocations are guided by market forces (Halal, Geranmayeh, Pourdehnad and Wiley, 1993). "In some ways these can be another form of a strategic business unit, usually even more focused" (Hinterhuber and Levin, 1994:47). ABB was a global federation of approximately thirteen hundred local companies organized so that they could act big and small

simultaneously. Each company enjoyed the advantages and resources of participating in a global business. At the same time, each of these small companies was a stand-alone operation with clearly defined responsibilities and considerable freedom to act entrepreneurially in its local marketplace. If internal transactions are to reflect market prices, every unit must have regular opportunities to verify the price and quality of its wares, by trading outside the firm or by having access to current comparative data on market conditions. The purpose of the INW, is to gain competitive advantage through shared utilization of assets as well as continuing development and exchange of managerial and technical know-how (Miles and Snow, 1992, 1994). Figure 10 illustrates the internal NW.

Figure 10: Internal NW



(Sources: Miles and Snow (1992:56) "Causes of Failure in NW organizations" California Management Review)

The most common managerial misstep in internal NWs, according to Miles and Snow (1994), is corporate intervention in resource flows or in the determination of transaction prices. Not every interaction in the internal NW can and should flow from locally determined supply and demand decisions. Corporate managers may often have reasons in having internal units buy from an internal unit at higher prices than in the marketplace. The manner in which corporate management handles such arranged transactions is a crucial factor in the continuing health of the NW. "Ideally, corporate executives will manage the internal economy rather than simply dictate the transfer price and process. The process may be demanding for the managers, but it serves to protect the logic of market-based internal transactions" (Miles and Snow, 1992, 1994).

"There is no one generic form of NW organization. Multiple forms exist, and the realization of commonly touted benefits of NW structure and interaction is in effect contingent on precise properties of the NW" (Ibarra, 1992:170; Brass and Burkhardt, 1992:171).

Although, as presented earlier, the NW form organization in its several variations has sought to incorporate the **specialized efficiency** of the functional organization, the **autonomous operating effectiveness** of the divisional form and the **asset transferring capabilities** of the matrix organization, the NW form itself has inherent limitations and is vulnerable to misapplication and misuse. Miles and Snow (1992:57)

examined the real and potential weaknesses of the NW. Table 3 summarizes the causes of failure in the three types of NW organizations.

Table 3: Cause of Failure in NW Organizations

Types of NWs	Stable	Internal	Dynamic
Operating Logic	A large core firm creates market-based linkages to a limited set of upstream and /or downstream partners	Commonly owned business elements allocate resources along the value chain using market mechanisms	Independent business elements along the value chain form temporary alliances from among a large pool of potential partners
Primary Application	Mature industries in a relatively stable environment, requiring large capital investments. Varied ownership limits risk and encourages full loading of all assets.	Mature industries requiring large capital investments. Market-priced exchanges allow performances appraisal of internal units.	Low-tech industries with short product design cycles and evolving high tech industries, (e.g. electronics, biotech, etc.) in a dynamic environment
Extension Failure	Over utilization of a given supplier or distributor leading to unhealthy dependence on core firm	Extending asset ownership beyond the capacity of the internal market/ performance appraisal mechanisms	Expertise may become too narrow and role in value chain is assumed by another firm
Modification Failure	High expectations for cooperation can limit the creativity of partners	Corporate executives use “commands” instead of influence or incentives to intervene in local operations	Excessive mechanisms to prevent partner’s opportunism or exclusive relationships with a limited number of upstream or downstream partner

(Source: Raymond E. Miles, Charles C. Snow in “Causes of Failure in NW Organizations” California Management Review, 1992:64)

Having reviewed various types of NWs from the literature, it has been determined that the three generic NW forms categorized by Miles and Snow and (1994) (namely dynamic, stable and internal NWs) are opted to be the organizational model for the empirical study in this dissertation. This choice is justified by considering the large number of NW cases processed by Miles and Snow and the comprehensiveness of the literature explaining NWs and their building process.

2.3.3 NW Building Process (different developmental phases)

NW form organizations, like any type of organization, have their life cycles. The developments of NWs, even though similar to the conventional life cycle of single companies, have yet to be formalized further to allow for the emergence of a comprehensive model (Sydow 1992). Jarillo (1993); Miles and Snow (1992); Snow and Thomas (1993) and Sydow (1992) suggested a subdivision of the dynamics that underlies the NW’s development and that permits a workable distinction of three to five major stages. Snow and Thomas (1993) outlined a three-phase model of the NW building process which consists of: 1) a formation phase, 2) a development phase and 3) a test phase.

Formation Phase – Normally, at this stage, an individual or a group recognizes an opportunity and initiates sharing resources across firms - someone having seen beyond one complementary transaction to the benefits of a continuing interaction along the value chain. That someone then envisions and articulates the shape of a broader collective of firms with unique features for the market and mutual benefits its internal members to its internal members.

Development Phase - This phase is about “getting engaged” and setting up a common household” (Kanter 1994). Once a set of potential NW partners has been identified, emphasis shifts from design to decisions about operation.

Test Phase - Once established, NW requires continual enhancement if they are to operate smoothly and effectively. Thus, the process of NW development is ongoing (Snow and Thomas, 1993:220). After the NW has been set up, and has started to work its strengths as well as its weaknesses will have begun to appear. The third phase is now the period when NW members have to “learn to collaborate” by “changing within” or “applying for divorce” (Kanter 1994).

2.3.4 Summary

In the preceding section an overview of literature on NWs has been presented along with the organizational development, definitions and different types of NWs. Section 2.4 focuses on presenting the principal theoretical and empirical findings regarding the selected key variables to be analyzed in this dissertation.

2.4 KEY NETWORK VARIABLES

This section focuses on presenting literature review concerning the selected NW variables as indicated in Figure 1, in section 1.2.

Section 2.4.1 begins to present an overview of **actors**, which includes an introduction in section 2.4.1.1 on the type of actors who play the broker’s role. Section 2.4.2 presents **resource** and 2.4.3 presents **structural and relational properties of NWs** beginning with **activities**. It is then followed by the **formal structure of the relations in a NW**, covering different indicators of relations such as density, connectivity and diversity. Section 2.4.3.2.2 presents the power and influence in a NW - wherein selected measurements of centrality such as degree, closeness, betweenness and structural holes are to be presented. Section 2.4.3.3 focuses on the behavioral properties in a NW and sections 2.4.3.4 and 2.4.3.5 put emphasis on the **role distribution** among actors in a NW and in particular, **the broker role** in the different types and life cycles of NWs; namely, how strategies are made and implemented by the brokers. Section 2.4.4 presents a literature review and empirical findings concerning variable **environment** which provide an updated overview of China’s economic development and the present business environment and challenges faced. The final variable to be presented in this chapter is **performance**.

2.4.1 Actors

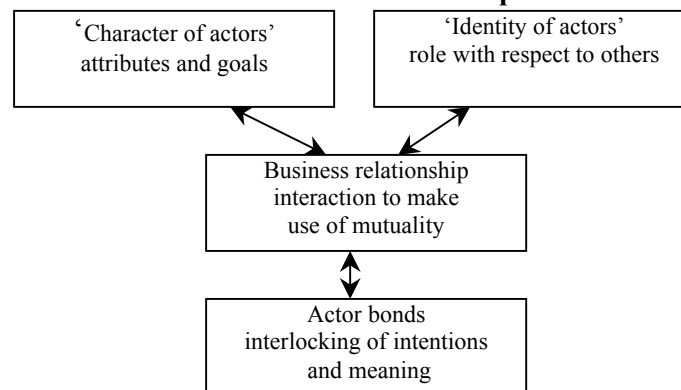
“Social NW analysis is concerned with understanding the linkages among social entities and the implications of these linkages. The social entities are referred to as *actors*. Actors are discrete individual, corporate, or collective social units. Examples of actors are people in a group, departments within a corporation, public services agencies in a city, or nation-states in the world system” (Wasserman and Faust 1994). Furthermore, most social NW applications focus on collections of actors that are all of the same type (for example, people in a work group) - the **one-mode NWs**. However, some methods allow one to look at actors of conceptually different types or levels, or from different sets.

The relations between actors can be categorized according to their **content**, such as the exchange of goods or information (Baker 1992; Sydow 1992) and their **structure** and **culture**. Baker (1992) postulated that the actors or agents be independent members of the NW. The NW of interest is composed of companies. Consequently, a company in a NW must be an economically and legally independent agent. A firm is legally independent if it constitutes a separate corporate body (Wohe 1990).

“The notion that companies are actors, in the sense that they acted purposely”. From the relationship perspective Hakansson and Snehota (1995:194) explained that it is based on the assumption that companies have some goals, shared and pursued by individuals in the organization, and that those goals, in turn, guide the behavior of individuals. It reflects the view that actors are independent of their context and that their behavior is determined by their own characteristics and properties.

Further, according to Hakansson and Snehota (1995:195) companies which can be considered as actors are based on the notion of identity they acquire in interaction with others. In order to survive and develop they have to attract interest and resources and to elicit action from others. To achieve that, they must be perceived by others as a distinct, intelligible entity; as a company has to acquire the identity (the meaning) of an actor in the eyes of others. “Companies are actors because they are attributed the identity of an actor by those who interact with the company. The identity is the interpretations by others. Therefore, companies as actors are part of their context which they mould and by which they in turn are shaped.” “A company consists of different units built up of a subset of resources and performing a subset of activities. Each can have a distinct identity to counterparts. When a unit of a company controls resources and /or performs activities which are identifiable as an entity for other actors, it will be identified as an actor with a distinct identity. Larger companies will almost always be seen as multi-actors. Every such unit within a company will be seen as an actor within its own identity and with bonds to other units belonging to the same company and with perceived links and ties to the activity structure and the resource collection of other counterparts. What the relationship perspective brings into the picture is the dependence of what companies can achieve in relationships to others—not only on their attributes in terms of resources and activities (their ‘character’), but also on the binds they develop and maintain with others and thus their identity” (Hakansson and Snehota 1995:195-197). Figure 11 illustrates that companies are treated as actors mainly on the ground that in business relationships companies are attributed identities by those they interact with.

Figure 11: The Actor Dimension in Business Relationships



(Source: Hakansson. H and Snehota.I., Developing Relationships in Business NWs 1995:196)

Among all actors in a NW, Burt (1983) emphasized that the broker is a prominent member to the extent that his relations make him particularly visible from both inside and outside of the NW. Given the focal point of brokers in this dissertation a specific introduction of the NW brokers is presented in the imminent section.

2.4.1.1 NW Brokers

The notion of ‘broker’ refers to the organizing power of the NW, but does not exclude proper production or other participation in the production process, as opposed to the definition by Snow and Thomas (1993). Many authors have identified a dominant member in the NW. ‘**Focal company**’, ‘**Strategic center**’, ‘**Server**’, ‘**Imaginator**’ and ‘**Coordinator**’ are just a few of the many creations of researchers facing this phenomenon and they will be used synonymously to the ‘broker’ (Snow and Thomas 1993; Sydow, 1992; Lorenzoni and Baden-Fuller, 1995; Hinterhuber and Levin, 1994; Hedberg, 1996; Galbraith 2000). According to Burt and Minor (1983) the broker is a dominant and central company in the NW that defines the strategy of the NW. The notion of dominance implies power, influence and greater access to resources (Hirsch 1997).

The most important characteristic of the broker is to be found in the content of the relations they are entertaining. In addition to the workflow charges belonging to their productive role in the NW, the broker is surrounded by ties of more sophisticated communication and coordination (Snow and Thomas 1993). These ties are results of the broker’s role as strategic manager and administrator of the NW. Such ties can be formal in the sense of a written contract and official NW management control system linking data to the broker (Lorange and Roos 1992). General Motors, for example, obliged its partners to report every three months to its headquarters (Jarillo 1993). The ties can be informal, as for example due to close personal contacts or tacit agreements. Benetton handpicks most of the members who are personally connected to the broker and can be coordinated informally (Jarillo 1993).

The broker is **central** to the system. Centrality can be measured by three factors: the degree of relations, the closeness and the betweenness (Brass and Burckhardt 1992, Burt 1983). The three measurements of centrality will be presented in section 2.4.3.2.2.1. The broker as the most central figure is not only surrounded by most members but also generally entertains the best connections to the further ends. The strategic center is the ‘star’ in his NW entertaining a great number of links and influencing the relations of the other members (Sydow 1992).

The broker enjoys his position of prominence as a benefit of the competitive advantage he holds. This advantage may be based on brands (e.g. Nike, Benetton), technologies (e.g. IBM) or better access to new markets (companies that have succeeded to establish links to relatively closed markets (Calori and De Woot 1994; Hedberg 1996; Jarillo 1993; Lorenzoni and Baden-Fuller 1995). Some researchers also suggest economic size as a criterion for the broker (Hinterhuber and Levin 1994; Jarillo 1993). Small firms can also take the lead in NWs, as for example the fashion brand ‘Gant’ which launched a NW by holding its brand-name (Hedberg 1995). Size, hence, is not a necessary condition for the broker.

This section has portrayed a general picture of the NW broker. In the later sections 2.4.3.4 and 2.4.3.5 of this chapter, further literature concerning the NW broker is to be

presented in relation to the role and behavioral pattern of this particular type of actor in the process of building strategic NWs. Before that, the next section presents the literature concerning the variable *resource* from a relationship perspective.

2.4.2 Resources

In section 2.2.3, a resource-dependency theory was presented for explaining the motives of firms in their decision of forming strategic alliances from the resource point of view. The objective of this section is to gain an overview of the concept of the variable resource from a relationship perspective. Given the importance of resources in business enterprise, it is not surprising that resources are essential in several theoretical traditions that deal with business behavior. The view of a firm as essentially a resource entity and as being dependent on a resource, is common to the microeconomic theory (Penrose 1959, Alchian and Demsetz 1972) and its applications in the field of industrial organization. The importance of resources has been recognized in organization theory (Pfeffer and Salancik 1978) and in the management literature. Recently it has inspired the so-called resource-based view of the firm among those concerned with business strategy development (Barney 1986, Itami 1987, Grant 1991). Coase (1937) emphasized that the very purpose of the firm is economizing on scarce resources and the control of resource. Hakansson and Snehota (1995:134) argued that creating and developing resources rather than economizing on resources is the primary purpose of the companies.

Itami (1987) explained that different types of resources are usually distinguished in a business enterprise, such as manpower, technical facilities, know-how, financial resources, and materials etc. Some are tangible. Others are intangible, such as know-how, skills, goodwill, trust, customer base, and supplier base or company image. All are important resources in business. Every business firm combines a unique set of resources as much as it carries out a unique set of activities; it is a collection of different resource elements. Resources are related to activities performed. They tend to persist over time as activities are continued (Hakansson and Snehota 1995).

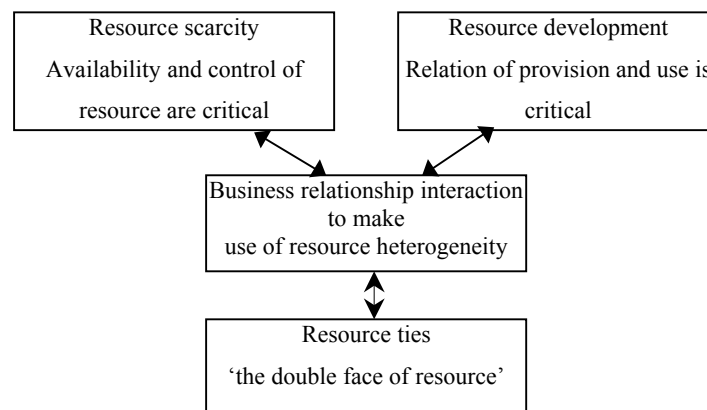
The resource concept is straightforward as long as resource is thought of as given elements to be combined and transformed in a production process into other resource elements (products). "As long as resources are viewed as homogeneous in their use, their value will be independent of what other resources they are combined with when used and seemingly they have value in themselves." The resource concept becomes more complex if the resources are regarded as heterogeneous, in meaning that their value depends on which other resources they are combined with. "Once we accept the heterogeneity in use, resource must be evaluated in different combinations and constellations" (Hakansson and Snehota 1995).

Alchian and Demsetz (1972) defined the heterogeneous resources as resources which give different marginal returns dependent on what other resources they are combined with. The values of the different resource elements also depend on the use made of those and that will tend to differ – to be heterogeneous. This resources heterogeneity assumption puts the experiential learning in focus when using resources (Lundall 1988). Alchian and Demsetz (1972) further argued "the results of a combination of resources that are heterogeneous are impossible to know in advance and have to be learned. Joint learning can be accompanied through interaction of resource providers and users. The more that is known about how the different dimensions of resources

can be used together, the more effectively they can be combined. In this way resources are developed.”

Penrose (1959) expressed a similar view emphasizing the close relation between the resources of the firm and those in its environment. As the individual firms are collections of heterogeneous resources, a business relationship relates the resources of the two firms and allows their combined effectiveness to be increased. Hakansson and Snehota (1995) believed that the resources heterogeneity is highly relevant to resource ties in business relations; it explains to a large extent why inter-company relationships often tend to be relatively broad in content and stable over time. In addition, Hakansson and Snehota (1995:135) emphasized that another aspect of resources which deserves major attention is the resource development. The main themes in the analysis of the resource dimension of inter-company relationships are presented schematically in Figure 12.

Figure 12: The Concept of Resource Ties



(Source: Hakansson H. and Snehota I., *Developing Relationships in Business Networks* 1995:136)

Business relationships between two companies connect their resources. As resource ties develop they become mutually and increasingly interdependent. Consequently, the borderline between the internal and external resources becomes blurred. It is through relationships that different resources can be mobilized, made available and offered to others.

Hakansson and Snehota (1995:137) made another important point: “relationships themselves can be considered and used as resources or assets, since they are productive and thus a source of value to the parties. Existing relationships are valuable assets in business, despite the difficulty in assessing and measuring their value.” They argued that relationships are the most significant resource in what makes a company capable of unique performance. “Relationships are the kind of asset that is difficult to reproduce and emulate for others and therefore critical for a company’s performance” (Itami 1987). Due to the reasons of their ‘intangibility’ and heterogeneity, it is difficult to quantify the value of relationships as resources. The value of resource elements lies in its use in combination with other resource elements. In a relationship, certain specific resources of a company are tied into another company’s resource collection. “The value of a relationship for a company will depend on how it is combined with other resources.” Relationships are a peculiar type of resource as the parties involved control them jointly. Those who have ‘invested’ in it jointly own a relationship. Development of relationship follows a rather typical

investment cycle. It takes time and effort to build up a relationship while benefits tend to lie ahead in time (Johanson and Wootz 1986).

Likewise, a relationship is a resource only if the two parties keep it alive. As soon as one of them does not find it worthwhile its value starts vanishing. The development of resource ties and the two parties involved can only jointly control their value. Resource ties connect some of the resources of one company to some of the resources in another company. The same resource elements become tied to other resources in the resource collection on each side and to resources of some third parties these resources affect each other (Hakansson and Snehota 1995:138).

Hakansson and Snehota (1995) called this structure, formed by the connected resource ties, a resource constellation. "The resources constellation reflects the overlay of knowledge of resource use (technology) in the business NW. It develops as knowledge evolves and makes the development of knowledge possible. The resource constellation develops as a consequence of resource ties being established jointly by the companies."

In order to handle the ties in a resource constellation, learning needs to be coordinated. Learning with respect to use and provision of resources can be accomplished by companies in three different ways: 1) by the single actor developing ability through experimentation (learning by doing); 2) by actors using each other's knowledge and experience; 3) by joint learning based on several actor's knowledge and experimentation.

"Two conditions in the resource collection favor coordinated learning: **stability** in certain relationships between resource providers and users, and **variety**. A resource constellation based on a network of business relationships is a structure that has features of both stability and variety. Relationships affect both the availability of assorted resource elements and how resources are provided and used. No company has direct (ownership) control of all the resources necessary for its activities. There are always resources, external to the company, that need to be acquired. The bulk of these are made available through exchange with others. Some of the relationships of a company obviously serve mainly this purpose. There are other valuable resources that cannot be transferred but can be utilized. These resources can be accessed, made available, only through relationships; generally, these resources are the material know-how, knowledge of the market, and application know-how or technology. The control of these is an indirect, joint control shared with a counterpart. Other relationships of a company may serve the purpose of accessing these resources. "Business relationships are a means to acquire or access specific resources possessed by others and to tie the different resources into the assortment (collection) of resources required to sustain a certain activity structure. They are thus a means to ensure availability of resources and thereby gain a certain degree of control over the resources needed. (Hakansson and Snehota" (1995:143).

Concerning the claim that ownership control is more costly but more effective than the partial, joint control through relationships, Weick (1969) argued that the **loose couplings** have significant advantages in terms of effective resource allocation over time in a complex and unpredictable context: "The resource development might be more intensive when two different parties take responsibility. When resources are controlled directly, the effort may be directed in one specific direction. The tension in a freely agreed connection (relationship) between two resource units can be balanced by other relationships. That is why joint control is likely to produce a more effective dynamic allocation of resources. Indirect resource control through relationships is

thus beneficial in terms of the flexibility or strategic mobility of a company over time. Also it may be easier to expand the resource allocation through exchange relationships rather than by means of ownership control.”

Hakansson and Snehota (1995:146) concluded that the external resources are important in a company's resource collection and the relationship is valuable resources both for the availability and development of the resources collection a company can mobilize. “This has implications for how we should draw the boundaries of a business enterprise. Legally the boundaries of a business are defined by the ownership of (property rights over) resources and the distinction between internal and external resources is relatively clear. Once we consider the actual possibilities for mobilizing assorted resources the drawing of a boundary line becomes more problematic. If an enterprise is a collection of resources that can be mobilized and used, then the relevant resource collection is considerably broader than that conferred by the property right, and the boundaries of a company become diffused.” The features and effects of resource in business NWs from the relationship perspective according to Hakansson and Snehota (1995:146-7) are summarized as the following:

1. The value of resources lies in their use which evolves over time. In business, development of resources becomes an important issue in addition to availability.
2. The value of resources lies in their use that is always made in combination with other resources. Resources are heterogeneous in use and value.
3. In a business relationship, provision and use of resources become connected. As the two become adapted, resource ties arise that affect the value of resources.
4. In a relationship involving the use of resource elements, adaptations can lead to the emergence of unique combinations. Tying of resources has both direct and indirect innovative functions, as parties to the relationship learn about the use and provision of resources.
5. Resources ties in relationships blur up the traditional clear division between internal and external resources. Relationships are resources in themselves. Their value depends on how they are combined with other resource tiers that form the resource collection of a company and the resource constellation in the NW.
6. A company's ability to handle the ties might be more important for its results than the amount and type of resource it possesses. A company's total capability is determined by the total resources it can mobilize through relationships.
7. The use of a resource can always be developed further. New ties being developed in a relationship might lead to development of ties in other relationships.

2.4.3 Structural and Relational Properties of NWs

Bircher (1998) outlined the major aspects of the NWs' structural and relational properties: 1) the qualitative 'content' of the activities realized in the NW and the relations resulting from the nature of these activities - Which activities are executed in a NW? 2) The formal structure of the relations and the measurement of these relations - How to describe and to measure the relations? 3) The attribution of the activities on the actors and the possible 'standard' - Which are the actors' roles in the NW? The presentation of these aspects begins in the following section with 'activities'.

2.4.3.1 Activities

NWs perform various activities, develop products, produce and process information, purchase and sell. Activities performed and the ways they are carried out are determinants of the costs and revenues of a company (Hakansson and Snehota 1995:50). The traditional approach to the activity dimension in business revolves around the type of products and the way these should be produced. It draws attention to the production activities in a company. "Activity can be defined broadly as a consequence of acts directed towards a purpose." For a company, a common distinction is to view some activities as '**internal**', generally those indirectly involve others outside the company, and some as '**external**', generally activities directed to or involving others. Activities such as production, research and administration are viewed as internal, while purchasing, financing, personnel selection, and sales are considered external (Hakansson and Snehota 1995:52).

According to Jarillo (1993:26) two criteria matter: 1) the activity can stand on its own, training, for example. 2) The activity has 'strategic relevance' - either the activity makes up a large part of value added in the industry, or it is a source of competitive advantage. All activities can be subcontracted to other companies who then become part of the industry. Further, the industry and business systems are the collection of all activities that have to be performed in order to deliver a product or service to a final customer. Still further, most companies perform activities that are part of different industries. Choosing what its exact activities are going to be is a basic strategic decision for a company. It is at the activity level that much of the competitive advantage can be gained. It is important to distinguish between a given economic activity and the company that performs it. Jarillo (1993:41,42) argued, "in essence, profitability is a characteristic of activities." Then he explained that the basic way of framing the strategic territory of an industry is to decompose it into its basic activities, analyze the profit potential, and then emphasize the importance of the coordination of the different activities. According to Jarillo, the coordination of the different activities is also a costly, value-adding activity, and that it can be performed in a more or less efficient way (and in a defensive way) - since the flow of goods along the industry system implies cost in physical distribution, adaptations to different customers, and the flow of information etc. The total costs incurred in delivering a product or service to the final consumer can be divided into two parts: 1) the activities necessary to manufacture or perform, and 2) the cost incurred in putting those activities together. 'Coordination activities' glue together all functional activities making the final product 'better,' or enabling companies to deliver it at a lower cost. The two ways that companies organize their economic activities' vertical integration and market based subcontracting (Jarillo 1993:94) are presented in section 2.4.3.3.1.

According to the concept of minimum efficient size (MES), as determined by the economies of scale applying to activities, a given activity must be performed in order to be as efficient as possible. Since the MES is different for each activity, a company may find itself too large for some activities and too small for others. This is one of the main reasons why companies are opting to subcontract many activities they used to perform in house. Besides economies of scales, a labor-intensive activity may be performed in a low labor cost area. Alternatively, the cost of the activity may be crucially dependent on a highly skilled labor force, or the company may enjoy a geographical location that lowers its costs by being close to its customers or to its

suppliers. A company must lower its processing costs, the costs of its inputs, and the costs of coordination. This is essential if one is to deal with uncertainties, inventories, information transfers, specialized assets, etc. “The final profitability depends on the profitability of the different activities and their coordination” (Jarillo 1993:18,26, 37,38, 42). The traditional approach classifies alliances along the combinations which are made between the various activities of the value-chain. Figure 13 illustrates how companies combine their activities in a NW.

Figure 13: Combination of Activities in a NW

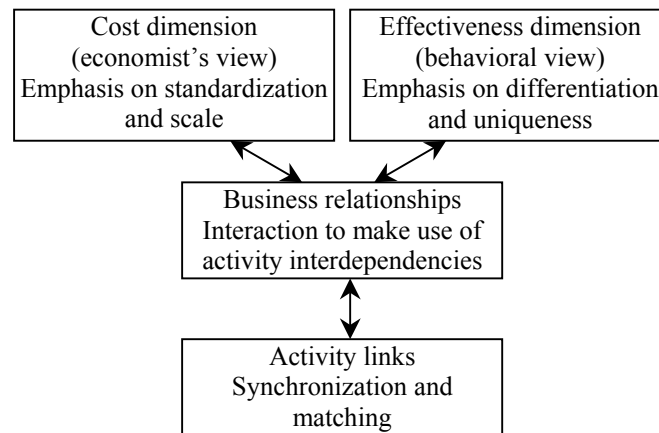
COMBINED ACTIVITIES		OBJECTIVES, SYNERGIES
SIMILARITY of combined activities	SUPPLIES + SUPPLIES PRODUCTION + PRODUCTION	Power on supply side Economies of scale, Costs Capacity utilization Customer satisfaction, Economies of scope
	DISTRIBUTION + DISTRIBUTION	
	R&D + R&D	Innovation, complementarity of knowledge
COMPLEMENTARITY of combined activities	SUPPLIES + PRODUCTION R&D + PRODUCTION	Outsourcing and flexibility Reduction of delivery time Multiplication of innovation, Outsourcing of production Growth and penetration of new markets, globalization Utilization and multiplication of a key resource
	PRODUCTION + DISTRIBUTION PHYSICAL AND HUMAN RESOURCES + FINANCE	
	RESOURCES + MANAGEMENT	Value management, Improved management Avoidance of take-over

Source: Bircher (1998) Combination of activities in an alliance: “A NW Approach to Telecommunication-Introduction”

Bircher (1998:11) explained that the complementary combination of activities is the most important form of cooperation in the technological environment of Swiss telecommunications. There are activities in the chain to the customers which are not under the control of the participants, and the force of these activities add-up. Innovation in the chain may be one of the reasons. For those participants which have heavily invested in the infrastructure, economies of scale and capacity utilization are important reasons for cooperation. Moreover, the competitors who are more distant to the customer seek partnership with those who control the access to the final customer. Hakansson and Snehota (1995:52) argued that two different perspectives on activities lead to different explanations of activity structure. The first leads to emphasis on the dependence of activities on resources (costs dimension), while the second emphasizes the dependence of activities on the capabilities of the actors (effectiveness dimension). Both concentrate on what might be called internal activities in a firm. Hakansson and Snehota (1995:53) combined these two perspectives toward a direction of relationships and interaction between companies. They took the stance that activities of a company are performed in anticipation of and in response to activities performed by others, and both the cost and the effectiveness dimensions are equally important. The economic consequences of activity structure reflect the balance of standardization and differentiation of activities in the activity structure of a company. What the two perspectives have suggested is that activity standardization is related to ‘economies of scale and scope’ (Chandler 1990) and that activity differentiation is related to the possibility of exchange and thus to ‘economies of effectiveness’ (Scott 1992;

Hakansson and Snehota, 1995:54). The resulting theoretical concept is that of activity links⁵ as illustrated in Figure 14 below:

Figure 14: Theoretical Bases of the Activity Link Concept



(Source: Hakansson, H and Snehota, I., Developing Business relationships in Business NWs 1995:53)

This section summarizes the presentation on the variable **activity** by using the conclusions drawn by Hakansson and Snehota (1995; 62) based on their conceived activities in NWs from a relationship perspective:

1. An activity can always be decomposed in minor activities or integrated into larger activities, depending how the actors choose to define it.
2. The process of the activities includes 'economic' considerations of standardization and scale, behavioral considerations of differentiation and uniqueness, and relationship considerations of interdependencies. The process results in activities that are linked to each other in different ways.
3. Activity links lead to activities that are synchronized and matched. Activities performed by two actors in a relationship are linked due to the development of the ties. They can decrease the costs for performing the activities and /or increase the outcome of the combined activities.
4. Activities are linked to each other in different row as part of an activity chain. Both direct and indirect links exist
5. Different activity chains are connected to each other and result in an overall activity pattern. Every link is a piece in a larger whole. Changing one link may affect the whole pattern and further leads to an adaptation to a certain link
6. Activity links are central for an organization and determine if its internal activity structure fits into the overall activity pattern. They are decisive for the outcome of the company's performed activities.
7. The activity links are formed through relationships mainly with demand and supply. The links are combined with each other and with the internal structure of

⁵ The activity links- a relationship between two companies connects activity structures of the two units. It consists of activities that can link, more or less tightly, various parts of the activity structures. The number and types of activity links in a relationship can vary. Activity linking is a form of coordination and is achieved by mutual adjustments of activities, i.e. adaptations that are condition and consequence of activity links on either side. They can be regarded as both the activities performed jointly within the relationship and activities performed in the respective company (Hakansson 1982, 1995, Turnbull and Valla 1986, Hallen, Johanson and Sayed Mohamed 1989).

the single company, thus determining the capabilities of the company. Finally, there is the strategic issue of positioning the company within the broader activity pattern.

2.4.3.2 The Formal Structure of the Relations in a NW

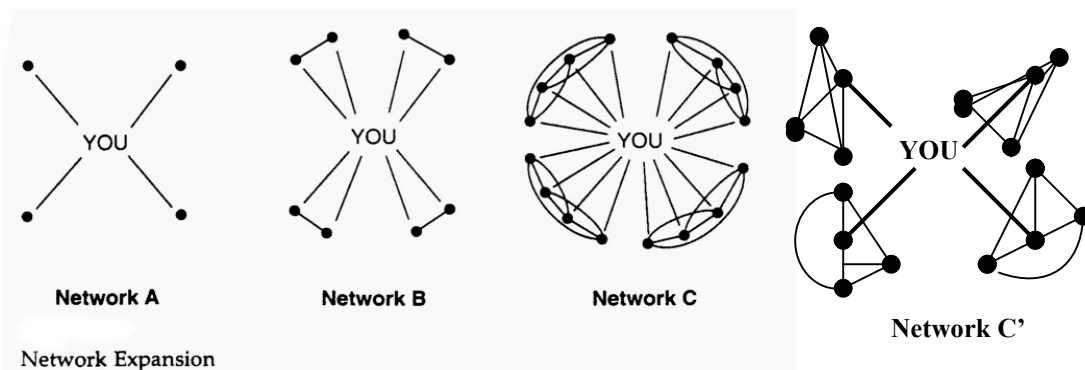
This section introduces the literature describing the formal structure of the relations and the measurement of these relations. The presentation consists of three parts: section 2.4.3.2.1 introduces three NW properties: **density**, **connectivity** and **diversity**; section 2.4.3.2.2 deals with **centrality** indicating ratio of the relations of one specific actor to all relations in a NW and finally, the concept of **structural hole** is presented in relation to the power and influence in the NWs.

2.4.3.2.1 Density, Connectivity and Diversity

Density is defined as the ratio of actual to potential ties among actors in a NW, and connectivity is the degree to which members of a NW are linked together through direct or indirect ties (Burt 1982). “High density and connectivity imply a high degree of interdependence among different segments of the NW and by corollary, a high degree of inter-group contact in NW relationships. Density and connectivity may be used to describe both prescribed and emergent structures. The addition of dotted-line reporting relationships to a simple hierarchy, adds density, connectivity, and inter-group contact. NWs also differ in their degree of hierarchy, and centralization, concepts that describe patterns of stratification or inequality in the extent to which actors are involved in relations and which apply to both formal and informal NWs” (Ibarra 1992: 170). “A system is centralized to the extent that all relations in it involve a single actor. It has hierarchical structure to the extent that a single actor is the direct or indirect object of relations in it ... both these models described the extent to which a dominant elite is defined by NW” (Burt 1982:61).

The density is one of the important variables describing a NW in its formal aspects. It is the ratio of actual relations to potential relations such as transactions or interactions among the actors in the NW (Ibarra 1992). Usually in a large NW, one finds clusters of relations which have different densities. Creating a more extended NW means developing multiple links between different existing clusters (Bircher 1998). The **diversity** indicates the number of different types of actors or relations. The expansion of a NW consists in increasing the number of **non-redundant relations**.

Figure 15: Expansion and Efficiency of the NW



(Source: Burt, R.S., The Social Structure of Competition, in Nohria/Eccles 1992, p.64-71)

Figure 15 shows the expansion from NW A to NW B and NW C is redundant; there exist many direct and indirect contacts to the actors. It is more efficient to developing NW C', where four direct contacts result in 16 total contacts (Bircher, 1998).

"The NW analytical concept of density, connectivity, and hierarchy captures the contrast between NWs and hierarchies, traditional and post-bureaucratic organizations: mechanistic or bureaucratic structures ... comprised centralized, structured, single-stranded, and sparse NWs of asymmetric communication and control relations. In contrast, the organic organization associated with adaptive firms in turbulent environments was constituted by NWs of dense, lateral, diffuse, and reciprocal relations" (Shrader, Lincoln, and Hoffman 1989:45).

2.4.3.2.2 Power and Influence in a NW

With the resurgent interest in power in organizations, a multitude of theories and approaches have been offered. Common to many of these approaches is a reliance on exchange theory, or a dependency framework (Emerson 1962). "The power of A over B is typically defined as the extent to which B is dependent on A" (Marsden 1983). Building on this framework, the strategic contingencies and resource dependency approaches posit that power derives from control of relevant resources (Hickson et al. 1971; Salancik and Pfeffer 1977). Control by one actor implies that another actor in the social relationship has few alternative sources for acquiring the resource. "One actor controls or mediates another's access to the outcome or resource. A relevant resource is one that is in demand or in which another actor has a higher motivational investment" (Emerson 1962). "Employees who are able to control desired resources increase others' dependency on them and are able to acquire the resources or bring about the outcomes they desire" (Pfeffer 1981). "Actors seeking power must also decrease their dependency on others in addition to increasing other's dependence on them. This can be done by decreasing one's motivational investment in outcomes controlled by others, or by increasing the number of alternative resources available for acquiring the outcome. One must have access to relevant resources that is independent, not controlled, or mediated by others" (Emerson 1962).

Traditionally explanations for what gives an individual power in an organization have normally focused on the individual's personal characteristics, socioeconomic profile, formal position in the organization, attitudes and values, control over critical resources, and control over critical contingencies (Pfeffer, 1980,1992). Nohria (1992) argued that these explanations only provided bases of understanding on the distribution of power and influence in organizations, but not sufficient from an explanatory standpoint. An individual's position in various NWs of relationships can be a source of power quite independent of other factors. What the NW perspective provides is a more systematic way of understanding this classic intuition.

Bonacich (1987), Krackhardt (1990) and Nohria (1992) have all suggested that a NW perspective offers some very rich and interesting insights on where power comes from. Additionally, a NW perspective can also shed light on what strategies individuals should employ in order to try to gain power or seize control (White 1992; Ibarra 1992 and Nohria1992).

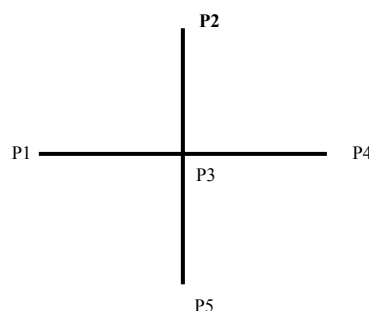
2.4.3.2.2.1 Centrality (degree, closeness, betweenness)

A common finding in social NW studies is that central positions are often associated with power and influence. Results consistent with this power and centrality relationship have been reported in small laboratory work groups (Shaw 1964), within organizations (Brass 1984, 1985; Fombrun 1983; Krackhardt 1990), across organizations (Galaskiewicz 1979), in professional communities (Breiger 1976), and community elites (Laumann and Pappi 1976).

Brass and Burkhardt (1992) contended that there are many different ways that one can be central in a NW. One can be central in the sense of **degree** (being the object of many relations), **betweenness** (being in the middle of paths that connect others), or **closeness** (having immediate access to others who are connected). Each provides a different basis of power. Nohria (1992) emphasized that to fully understand an individual's power it is important to know the relevant NW boundaries within which he is more or less central (e.g., the NW demarcated by the immediate subunit, the department in which the subunit is located, the entire organization, or the dominant coalition).

According to Freeman (1978), one general intuitive theme seems to have run through all the earlier thinking about **point centrality** in social NWs; the point at the center of a star or the hub of a wheel, like that shown in Figure 16, is the most central possible position. A person located in the center of a star is universally assumed to be structurally more central than any other person in any other position in any other NW of similar size.

Figure 16: A Star or Wheel with Five Points



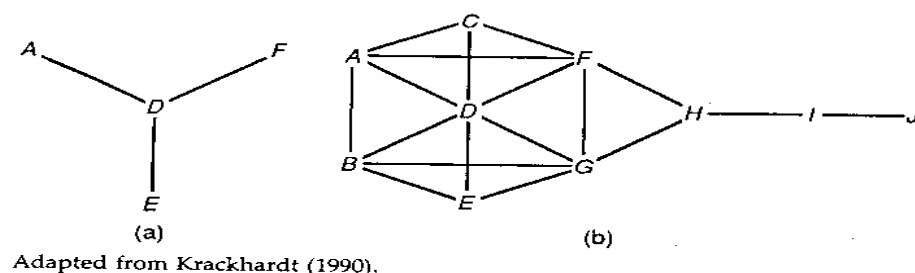
(Source: Linton C. Freeman. Social NWs 1978/79:219)

To determine the way or ways in which such a position is structurally unique, Freeman (1979) summarized three distinct structural properties that are uniquely possessed by the center of a star. That position has the maximum possible degree; it falls on the geodesics between the largest possible numbers of other points. And since it is located at the minimum distance from all other points, it is also maximally close to them.

The degree measure of centrality is calculated by counting the number of adjacent links to or from an actor. Based solely on direct connections, Freeman (1979) conceptualized it as a measure of activity. In Figure 17-a, position D has the highest degree centrality in both examples. **Closeness measures of centrality** account for both direct and indirect links in indicating how 'close' a person is to all other persons in the NW. It is calculated by summing the lengths of the shortest paths (geodesics) from a point to all other points. Direct links are counted as one step, with indirect links given proportionally less weight in the measure. In Figure 17-a, position D is the

most central. However, in Figure 17-b, positions G and F are most central when using the closeness measure. This measure can be interpreted to represent efficiency (the extent to which an actor can reach other actors in the shortest number of steps) or independence (being close to all other actors, a person is less dependent on intermediaries) (Freeman 1979). According to Freeman, it indicates the extent to which an actor can avoid the control of others. In accounting for indirect access to others, the closeness measures allow for the possibility that an actor with only a few direct links may be central by virtue of those few links being to highly central others. For example, an employee who is connected to central employees in the communication NW may have access to important information - a vital source of power in most organizations. **Betweenness measures of centrality** calculate the extent to which actors fall between pairs of other actors on the shortest paths (geodesics) connecting them (Freeman 1979). According to Freeman, this measure represents potential control over others. Thus, if persons A and C were connected only through person B, B would fall “between” A and C and would mediate the flow of any resources between A and C. In Figure 17-a, position D mediates the flow between any two of the other positions. However, in Figure 17-b, position H is the most central when calculating the betweenness measure. Freeman (1979) suggested that this measure is particularly appropriate for assessing power in communication NWs; a mediating person may withhold or distort information in transition. The closeness measure represents avoiding the control of others while the betweenness measure represents controlling, or increasing the dependence of others.

Figure 17: Centrality and Power in Organizations



(Source: Brass, D.J./ Burkhardt, M.E., Centrality and Power in Organizations in Nohria and Eccles 1992, adapted from Krackhardt 1990)

In addition to the above three measures of centrality, another frequently used measure was developed by Bonacich (1987). Bonacich presented that an actor's centrality is his or her summed connections to others weighted by the centrality of those others. The measure assumes that an actor's centrality is a function of the centralities of those actors with whom the actor has direct ties. Other measures based on similar assumptions include those developed by Hubbell (1965), Coleman (1973), and Burt's measure of prestige (1982).

Stephenson and Zelen (1989) have proposed one of the few measures of centrality that is not based on geodesics, but takes into account multiple shared paths between points. They argued that resources do not always flow along the shortest path, perhaps due to random fluctuations or actors whom intentionally attempt to hide or shield the source of the resource, or avoid the flow of the resource through a particular intermediary. Other measures of centrality have been suggested by Friedkin (1990).

Since it is impractical to include all these measures, Brass and Burkhardt (1992) have chosen to consider degree, closeness, and betweenness based on their previously discussed theoretical implications. “Closeness and betweenness represent the two necessary conditions for acquiring power- **decreasing your dependence on others and increasing other’s dependence on you**. The degree measure most closely corresponds to Emerson’s notion of alternatives. Together, these three best capture the dependency framework (Emerson 1962) used by many organizational scholars.” As illustrated in Figure 17-b, the complexity of embedded relationships within an organization makes it possible for each measure of centrality to contribute unique variance in predicting power. “While we expect some overlap among the measures, we hypothesize that each will be positively related to power and that each will add to the variance explained by the other two” (Brass and Burkhardt, 1992).

In a NW analysis for cooperative interfirm relationships, Walker (1992) explained that centrality in a NW is primarily a characteristic of individual firms - although the overall centrality of the NW can be determined by aggregating the centrality measures of the firms that compose it. “Centrality reflects the firm’s position in structure of the NW and maybe an element in the firm’s strategy. However, the structure of the NW is generally beyond the control of the firm. Thus centrality indicates a strategy based on the exploitation of current market forces rather than the development of cooperative strategy routines that extend the firm’s reach in the NW. Vertical relationships, which are inherently directional between firms, give meaning to centrality in the NW; horizontal relationships do not. However, a central location in NWs defined by different types of vertical flow will imply different benefits to the firm from its cooperative links to other firms.”

Nevertheless, Burt (1992) argued that centrality in NW is not necessarily the most important source of an individual’s power. Burt suggested that the extent to which individuals can surround themselves with “**structural holes**” (i.e., sit in the middle of disorganized contacts), the more autonomy and power they are likely to have. Burt argued that a structural hole is a more important indicator of power and influence than centrality is (Nohria, 1992). Hereafter, the structural hole is to be presented.

2.4.3.2.2 Structural Hole

Burt (1992) used the term “**structural hole**” to indicate the separation between nonredundant contacts. According to him, nonredundant contacts are connected by a structural hole which is a relationship of nonredundancy between two contacts. Because of the hole between the two nonredundant contacts the NW benefits provided by the contacts are in some degree additive rather than overlapping. Either nonredundant contacts are disconnected directly in the sense of no direct contacts with one another, or indirectly in the sense of one having contacts that exclude the others.

The respective empirical conditions that indicate a structural hole are **cohesion and structural equivalence**. Both conditions define holes by indicating where they are absent. **Under the cohesion criterion, two contacts are redundant to the extent that they are connected by a strong relationship**. A strong relationship indicates the absence of a structural hole. These types of relationships would be father and son, brother and sister, husband and wife, close friends, people who have been partners for a long time, people who frequently get together for social occasions, and so on. You

have easy access to both people if either is a contact. Redundancy by cohesion is illustrated in the left of Figure 18. The three contacts are connected to one another, and so provide same NW benefits. The presumption is based on Festinger, Schachter, and Back's analysis of information flowing through personal relations (1950) and Homans' theory of social groups (1950). Both argue that the likelihood of information moving from one person to another is proportional to the strength of their relationship. Empirically, strength has two independent dimensions: frequent contacts and emotional closeness (Marsden and Hurlbert 1988; Burt 1990). Figure 18 shows the structural hole indicators.

Figure 18: Structural Indicators of Redundancy

Redundant by Cohesion



(Source: Ronald S. Burt, 'the Social Structure of Competition', in Nohria/Eccles (1992),)

Concerning **structural equivalence**, according to Burt (1992), **two people are structurally equivalent to the extent that they have the same contacts**. Regardless of the relation between structurally equivalent people, they lead to the same source of information and so are redundant. Cohesion concerns **direct connection**. Structural equivalence concerns **indirect connection** by mutual contact. Redundancy by structural equivalence is illustrated toward the right of Figure 18. The three contacts have no direct ties with one another. They are nonredundant by cohesion. But each leads you to the same cluster of more distant players. The information that comes to them, and the people to whom they send information, is redundant.

Burt (1992) further explained that people are also structurally equivalent to how the criteria are correlated. People who spend a lot of time amongst one another normally get to know one another. The mutual contacts responsible for structural equivalence set a stage for the direct connection of cohesion. "The empirical conditions between two players will be a messy combination of cohesion and structural equivalence, present to varying degrees, at varying levels of correlation."

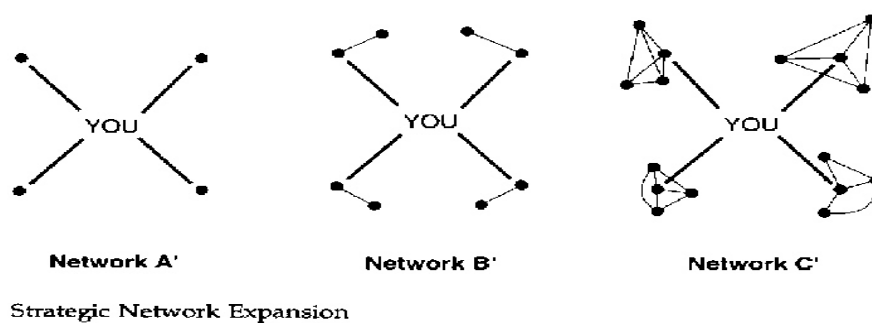
According to Burt (1992), cohesion is the more certain indicator. If two people are connected with the same people in a players' NW (making them redundant by structural equivalence), they can still be connected to different people beyond the NW (making them nonredundant). However, if they meet frequently and feel close to one another, then they are likely to communicate and may have contacts in common.

There is a structural hole between two people who provide nonredundant NW benefits. Taking the cohesion and structural equivalence conditions together, redundancy is most likely between structurally equivalent people connected by a strong relationship. Redundancy is unlikely, indicating a structural hole, between total strangers in distance groups.

According to Burt (1992), balancing NWs size and diversity is a question of optimizing structural holes. **The number of structural holes can be expected to increase with NW size**, but the holes are the key to information benefits. The optimized NW has two design principles: **efficiency** and **effectiveness**. Efficiency in

this case means maximizing the number of nonredundant contacts in the NW to maximize the yield of structural hole per contact. Given two NWs of equal size, the one with more nonredundant contacts provides more benefits. There is little gain from a new contact that shows redundancy with existing contacts. Time and energy would be better spent cultivating a new contact to unreached people. **Maximizing the nonredundancy of contacts maximizes the structural holes obtained per contact.** These reach the same people reached by the NWs A, B and C in Figure 15 but in a different way. What expands in NWs A, B and C in Figure 15 is not the benefits, but the cost of maintaining the NW. NW A provides four nonredundant contacts. NW B provides the same number. The information benefits provided by the initial four contacts are redundant with benefits provided by their close friends. All that has changed is the doubled number of relationships maintained in the NW. The situation deteriorates even further with the sixteen contacts in NW C. There are still only four nonredundant contacts in the NW but their benefits are now obtained at a cost of maintaining sixteen relationships. The sixteen contacts can be maintained at one fourth of the cost. The NWs in Figure 19 illustrates an efficiency way of NW expansion.

Figure 19: Strategic NW Expansion



(Source: Ronald S. Burt, *The Social Structure of Competition*, in Nohria/Eccles, 1992)

Figure 19 illustrates that one contact in each cluster is selected as a primary link to the cluster. Efforts are concentrated on maintaining the primary contact, and allow direct relationships with others in the cluster to weaken into indirect relations through the primary contact. These players reached, indirectly, are secondary contacts. Among the redundant contacts in a cluster the primary contact should be the one most easily maintained and most likely to honor an interpersonal debt to you in particular. The secondary contacts are less easily maintained. The critical decision obviously lies in **selecting the right person to be a primary contact**. With a good primary contact, there is little loss in information benefits from the cluster and even a gain by the reduction of effort needed to maintain the cluster in the NW (Nohria and Eccles, 1992).

"Repeating this operation for each cluster in the NW recovers effort that would otherwise be spent maintaining redundant contacts. By reinvesting that saved time and effort in developing primary contacts to new clusters, the NW expands to include an exponentially larger number of contacts while expanding contact diversity. Some portion of the time spent maintaining the redundant other twelve contacts can be reallocated to expanding the NW to include new contacts." (Burt 1992).

According to Burt (1992), the second principle, **effectiveness**, (for the NW) requires distinguishing primary from secondary contacts and focuses on preserving primary

contacts through resources. Contacts are ports of access to clusters of people beyond. Guided by the first principle, these ports should be nonredundant so as to reach separate, and more diverse NW benefits instead of the player maintaining relations with all contacts. The player at the center of the NW is then free to focus on properly supporting relations with primary contacts and expanding the NW to include new clusters. **The efficiency principle concerns the yield per primary contact. The effectiveness principle concerns the total yield of the NW.** The target is NW C' in Figures 15 and 19: a NW of few primary contacts - each a port of access to a cluster of many secondary contacts.

Burt (1992) explained several ways that NW benefits are enhanced. There is a higher volume of benefits because more contacts are included in the NW. Beyond volume, diversity enhances the quality of benefits. Nonredundant contacts ensure exposure to diverse sources of information. Each cluster of contacts is an independent source of information. One cluster, is one source of information because people connected to one another tend to know the same things at the same time. The information screen provided by multiple clusters of contacts is broader and better assures that the player will be informed of opportunities and impending disasters; especially since nonredundant contacts are linked only through **the central player** who is assured of being the first to see new opportunities created by needs in one group that could be served by skills in another group. The central player becomes the person who first brings together people, giving him or her the opportunities to coordinate their activities. These benefits are compounded by the fact that having a NW that yields such benefits makes the central player attractive as a NW contact to others as well, easing the task of expanding the NW to best serve his or her interests. Bircher (1998) interpreted the structural hole as an opportunity and suggested that a manager with limited time and resources must, therefore, develop a NW of relations as diversified but non-redundant as possible.

This section has presented the literatures concerning structural and relational properties of NWs covering key variables, the formal structure of the relations in a NW with different indicator of relations, and the power and influence in a NW and their measurements. The following section 2.4.3.3 will focus on the behavioral properties in NWs.

2.4.3.3 The Actions of Actors

Literature concerning actors' behavioral patterns with regard to cooperation and competition and their explanations are first presented in section 2.4.3.3.1. Section 2.4.3.3.2 follows by presenting cultural literature with an emphasis on China. Section 2.4.3.3.3 describes the importance of relationship, Guanxi and trust between NW partners. Finally, section 2.4.3.3.4 gives an introduction to the subject of learning in the NW alliance.

2.4.3.3.1 Cooperative and Competitive Behaviors

According to Jarillo (1993), companies traditionally, use two basic ways to organize their economic activity: 1) vertical integration and 2) market based subcontracting:

1) **Vertical Integrated systems** are organized to provide the resources which are needed for production from within the company. The main reason for integration was

the lack of trust towards outside suppliers. Companies worried about their standards of quality might suffer from an outside producer - believing that only in-house production would permit complete control of quality (Hinterhuber and Levin 1994). Many vertically integrated companies simply did not perceive the need to cooperate. According to Jarillo (1993:70) “vertical integration makes sense only if it lowers the costs in some of the activities, somehow improves the company’s performance in them, or affords better coordination than what could be achieved in an open market.” Furthermore, individuals are tempted to create ‘empires’ of subordinated employees and function to symbolize their importance within the organization (Lawrence and Lorsch, 1967; Miles and Snow, 1992; Nordhaus and Samuelson, 1989). If further diversification were intended, the control and executing would be retained in-house enriching the power of management.

2) Market based subcontracting is organized by firms which compare their activities with outside suppliers, in case of inferiority of the internal operation, by contracting with the outsider. Subcontracting has taken many forms, from spinning off internal divisions to shutting down single operations and switching from internal provision to external suppliers. Returns on internal resources were improved by the leverage effect of concentrating investments and energies on what the enterprise did best (Hinterhuber and Levin 1994). On the other hand, the system was also found problematic for the company because: (1) might transfer its competitive advantage to a potential competitor, (2) the competitive advantage could be diffused to its competitors by common subcontractors and (3) it could lose sources of learning and future innovation. Additionally, not all the outsourcing can always maintain maximum efficiency in the activities and lower coordination costs.

By using the external supplier’s investment, innovation and specialized capabilities to a full extent, the company gains a competitive edge seemingly for free that would be almost impossible create internally (Quinn and Hilmer 1994). Due to liberation of formerly wasted resources, the company could finally concentrate on its proper core competencies and hence largely improve its position on the market. To remain competitive to his clients, the external supplier expends his efforts in perceiving or even anticipating market trend and investing in the latest technology (Jarillo 1993). The company also outsources its risk without being bound to its supplier (Jarillo 1988). Outsourcing decreases risks, shortens cycle times, lowers investments and creates better responsiveness to customer needs. Fixed costs are largely turned into variable costs, hence diminishing the firm’s vulnerability and increasing its flexibility (Sydow 1992). The outsourcing company as a buyer on the market is free to pick only the best suppliers in the market.

3) NW Cooperation - The discrepancy between advantages and dangers of both outsourcing and integration promoted the emergence of an alternative solution. Enormous transaction costs incurred on the negotiation of contracts, the search of information on a partner or the adaptation of production system to the supplier’s products (Jarillo 1988,1993; Sydow 1992). NW’s way of organization has the potential to minimize unproductive expenses by combining the advantages of vertical integration with the market -type relations (Hirsch 1997).

Jarillo (1993:131) used the difference between a zero-sum game and non-zero-sum game to explain the difference between cooperation and competition. In a zero-sum game one player’s gain depends on somebody’s loss, while in a non zero-sum game there can be a net gain (or a net loss) when a company and one of its suppliers (or

customers) by negotiating a price and cooperating, may increase the total pie to be shared - thus turning the game into a non-zero-sum one. “The identification of cooperation with intra-company behavior and competition with inter-company relationships depends how one defines the boundaries of the ‘company’ i.e. the area within which cooperation reigns and outside which competition is paramount, for the boundary between cooperation and competition does not have to coincide necessarily with the legal boundaries of a firm. There can be cooperation across competitions, and competition within them.” These two dimensions are shown in Figure 20.

Figure 20: Interactions between Ownership Mode and Approach to the Relationship

	Cooperative approach	Non -cooperative approach
Common ownership	Vertically integrated company	Bureaucracy
No common ownership	Strategic network	Market

Source: Jarillo, J.C., “Strategic Networks: Creating the borderless organization” 1993:131)

The top row shows the common ownership situation with its two ways of existence: the company as a whole cooperating towards a common goal (vertically integrated company) or each member seeking the argumentation of his personal power (bureaucracy). The bottom row shows, on the right-hand side, a typical arm’s-length market relationship where independent units compete with each other. But the other box shows the relationship that underlies a situation where independent units consider their relationship a cooperative one because they believe there will be more to share by cooperating. Strategic NWs emphasize heavily on relations and their benefits to all participations. “Companies began to appreciate factors of synergy and decided to act cooperatively with their partners in the long term” (Jarillo, 1993).

The philosophical changes had impacts on the interaction between the partners. Relationships were now regarded as links that were to last and demanded commitment. By adopting this approach, partner turnover decreased sharply. This decrease helped firms save the costs of searching for a new partner and smoothed coordination due to knowledge of the members’ strengths and weaknesses. Long-term planning with the partners allowed each partner to know its place in the process. Members partly adapt their company and production to the specific needs of the system. A Japanese example shows that members of the supply system ‘Keiretsu’ often design their products and choose production sites in accordance with their partners - thus diminishing the transaction costs caused by design and transportation (Ferguson, 1990).

“Close cooperation and exchange of information limits the risk of lack of quality and improves inter-organizational learning (Badaracco, 1991). The interdependence limits

the danger of opportunism consequently, encouraging information to flow more freely and managers to concentrate more on strategic concerns. The firm is cooperating with the enterprises that produce flexibly with superior knowledge at sufficient scale at the same time outsourcing major parts of the risk” (Jarillo 1993; Sydow 1992).

2.4.3.3.2 Culture and Characteristics of Chinese Culture

Theoretically culture is a set of values and beliefs shared by people in a social community (Schein 1985). The function of culture is to establish modes of conduct, standards of performance and ways of dealing with interpersonal and environmental relations that reduce uncertainty, increase predictability, and thereby promote survival and growth among the members of any society.

Hofstede (1980) suggested that there are different levels of culture⁶: 1) a national level that depends on the nationality; 2) a level corresponding to a regional /or religious and /or linguistic group membership; 3) an industry level that depends on the activity sector where an individual works; 4) a firm level that depends on the firm where an individual works; 5) a level corresponding to a gender membership; and 6) a level corresponding to a generation.

According to Hofstede (1994:26-27), each individual belongs to different groups or categories at the same time and he or she has different levels of mental programming corresponding to different levels of culture. Mental programs ensuing the different levels of culture are not necessarily in harmony, however. Moreover, in modern life they tend to be in conflict. Religious values may be in conflict with generation values, gender values with firm values etc. Hofstede based his research on the ideas of American anthropologists such as Ruth Benedict and Margaret Mead who said essentially that all societies, modern or traditional, are confronted with the same fundamental problems and that only the different solutions to these given problems differ (Torral 2000:51). In his research Hofstede (1983) suggested the existence of four basic dimensions of culture. However, subsequently, Confucian dynamism was added to this complement as a fifth dimension by Hofstede (1991) based on a larger and richer cross-cultural empirical investigation (Chinese Culture Connection, 1987).

Confucianism has a profound effect upon Chinese culture. Education, accomplishment, tasks, jobs, family and obligations are highly valued in Confucianism whereas low emphasis is put on individual interests. Generally, Confucian philosophy advocates the importance of commitment and patience, orders relations by status, requires respect for tradition, frugality in consumption, reciprocation of greeting, favors and gifts, and imbues a sense of shame through its construction of the concept of ‘face’. This philosophy is driven by the concept of harmony or maintenance of balance of feeling. Balance occurs through complementarities, such as captured by the Taoist Yin and Yang conceptualization in action, emotion and activity. Conflict is perceived to upset this balance of feelings. In business transactions, individuals not being conversant or appreciative of the other’s cultural norms can cause imbalance. Often this culminates in acrimonious claims against each other. Such misunderstanding can be diminished through a process of appreciating each other’s aims, needs and expectations. This does not only pave better business conduct, but in the long-term leads to more business opportunities. To

⁶ Based on Hofstede’s (1980) value studies of IBM employees in approximately 50 different countries.

achieve this requires an understanding of the way that culture impacts upon the process of business conduct (Ahmed and Li, 1996).

A combination of Ahmed and Li's (1996:276-279) elaboration on the characteristics of Chinese culture as shaped by Confucianism along Hofstede's (1991) dimensions is presented below:

1) Power distance: According to Hofstede (1991) a greater power distance indicates an accepted hierarchy in organizational relationships, while a smaller power distance relates to greater participation in decision-making and greater quality in the organization. Power distance, or the degree to which the less powerful members of a society accept that power, is distributed unequally. The fundamental issue addressed by this dimension is how a society handles inequalities among people when they occur. People in societies exhibiting high power distance accept a hierarchical order in which everybody has a place and which needs no further justification. In societies with low power distance people strive for power equalization and demand justification for inequalities of power; hierarchy is seen as an inequality of roles established for convenience, decentralization is preferred, subordinates expect to be consulted, and the ideal boss is a resourceful democrat. In high power distance societies hierarchy in an organization is seen as reflecting existential inequalities and centralization is popular; subordinates expect to be told what to do; and the ideal boss is a benevolent autocrat.

Laaksonen (1988) suggested that top management in the Chinese enterprises enjoy much more influence than the western managers do with a highly centralized decision making system. The centralized nature of power stems from the fact that Chinese culture greatly honors authority and seniority. This is a direct reflection of the Confucian ideal that a person should obey parents and leaders (Ahmed and Li, 1996:276-279).

2) Individualism versus collectivism: According to Hofstede (1991), this subject relates to whether participants are concerned about their own needs, goals and achievements, or whether the social group norms and benefits take precedence. Individualism can be defined as a preference for a loosely knit social framework in which individuals are supposed to take care of only themselves and their immediate families. Collectivism represents a preference for a tightly knit framework in society in which individuals can expect their relatives, clan or other members of their in-group to look after them in exchange for unquestioned loyalty. The fundamental issue addressed by this dimension is the degree of interdependence a society maintains among its members. It is concerned with whether people's self concept is defined by "I" or "we." In collectivist societies offending leads to shame and loss of face. Employer-employee relationships are perceived in moral terms (like a family link), hiring and promotion decisions take account of the employee's in-group, and management is the management of groups. In individualistic societies offending causes guilt and loss of self-esteem, the employer-employee relationship is calculative (a contract based on mutual advantage), hiring and promotion decisions are supposed to be based on merit only, and management is the management of individuals.

Group harmony, trust, sensitivity and social cohesion are stressed by the Chinese culture. It encourages complex hierarchically based interrelationships and interdependencies (Redding, 1980). Hofstede (1980) described that the Chinese culture is collective oriented and individualism is considered as expressive or selfish behavior, rather than an extension of personal identity and responsibility. Primacy is

accorded to consensus building and the group. Within their groups members are required to cooperate and trust each other. At times this requirement makes it necessary for the individual to subordinate self-interest, or even the truth, in order to maintain group harmony (Ahmed and Li, 1996:276-279).

3) Uncertainty and risk avoidance: according to Hofstede (1991) uncertainty and risk avoidance refers to a tolerance for ambiguity or a need for stability in an organization where people with high uncertainty avoidance try to limit conflict and risk. Those with low uncertainty avoidance encourage conflict and risk taking. This is the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issues are to control the future or just let it happen. Societies exhibiting high uncertainty avoidance maintain rigid codes of belief and behavior and are intolerant of unorthodox behavior and ideas. Low uncertainty avoidance societies maintain a more relaxed attitude in which practice counts more than principles and deviance from the norm is more easily tolerated. In high uncertainty avoidance countries there is an emotional need for rites, even the rules never work. Time is money. People have an inner urge to be busy and hard work, precision, and punctuality are the norm. Innovation may be resisted and security is an important element in individual motivation. People in low uncertainty avoidance societies, believe there should be no more rules than are necessary, time is seen as a framework for orientation, hard work is taken when needed (though not for its own sake), precision and punctuality do not come naturally, and innovation is not seen as threatening.

According to Ahmed and Li (1996) Chinese culture places a premium on accountability, cooperative behavior, and respect for authority. Generally, Chinese have a tendency to avoid uncertainty and risk because of the high degree of collectivism and homogeneity demanded by their culture. Decisions are taken collectively which spread risk among group members. Accountability occurs at the group level. This generates, in individuals, a tendency towards risk aversion because any errors or mistakes made by one person can jeopardize the whole team (Pye, 1982; Murray, 1983; Knutsson, 1986). In overall terms, the Chinese organizational setting is one in which power is concentrated at the top and not shared. A typical Chinese organization structure is hierarchical; yet, responsibility remains diffuse because of collective decision-making (Ahmed and Li, 1996:276-279).

4) Masculinity-femininity: Hofstede (1991) highlighted the basic dichotomy between rational-achievement orientation and emotional-affiliation orientation. Masculinity represents a preference in society for achievement, heroism, assertiveness and material success. Femininity stands for a preference for relationships, modesty, caring for the weak and quality of life. The fundamental issue is the way in which society allocates social roles between the sexes. In some societies men are given the assertive roles and women the caring, nurturing roles. The maximum social differentiation in these societies will permeate the institutions (mostly populated by men) with an assertive mentality. They are termed masculine societies. Other societies strive for minimal social differentiation between the sexes. This means not only that women can take on an assertive role if they wish but, more especially, men are permitted to take on relationship-oriented, caring roles. They are termed “feminine” societies. In feminine countries managers strive for consensus, equality, solidarity and quality of working life, and conflicts are resolved by compromise and negotiation. In masculine

countries managers are expected to be decisive and assertive, the stress is on equity, competition and performance, and conflicts are resolved by fighting them out.

According to Ahmed and Li (1996), because in Confucian philosophy the stability of the state depends on the maintenance of order within the millions of separate families of which the whole is constituted, a great deal of reliance is placed upon interpersonal relationships in the conduct of business. There is a long-standing tendency towards reliance on personal trust. Many of the business dealings are based on personal relationships. Even though this situation is experiencing some changes, a critical factor for successful business in China remains the development of extensive personal relations. The concept of 'face' incorporates aspects of self and social image (Redding and Ng, 1982; Hwang, 1987) which is a measure of social value in Chinese society. The notion of 'face' features quite prominently in individual psychology and behavior and plays an important role in defining interactions.

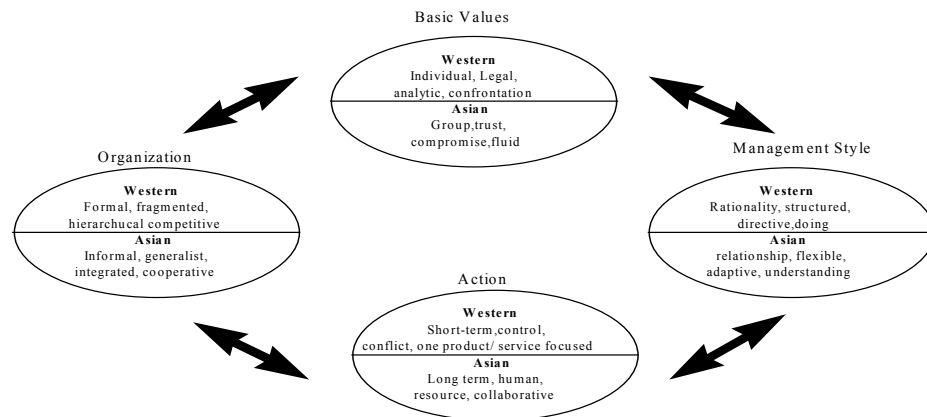
5) Confucian dynamism: examines society's search for virtue (Hofstede and Bond, 1988). This dimension embraces values of Confucian ethics and is characterized by a long-term orientation versus short-term orientation. Chinese individuals predominantly fall into the long-term orientation category of this dimension because of their strong "planning for the future" rather than current consumption attitude (Chinese Culture Connection, 1987). It is considered virtuous to be educated and hard working, and acquire skills that will produce success later in life. The values embedded within the long-term orientation inculcate a higher sense of entrepreneurship. For instance, persistence and steadfastness are requisite in the early phases of a business venture; thrift is essential to accumulate the necessary capital to initiate and subsequently develop the venture; and ordering of relationship by status and a sense of shame ensure a stable organizational hierarchy. Taken together individual aspects of the long-term orientation combine to reinforce an entrepreneurial perspective (Ahmed and Li, 1996: 276-279).

Neither Hofstede's model nor Ahmed and Li's elaboration on the characteristics of Chinese culture can be used to identify or describe the characteristics of individuals. The model and explanations provide only general identifications of cultural tendencies in societies and direct application may be misleading. The Chinese nationality consists of more than fifty-six different ethnic groups located in different regions throughout a vast territory, and each of them has its distinct cultural specifics. In addition to this multicultural dimension, the Chinese culture is experiencing a process of change with the country's overall development.

Several authors pointed out that cultural differences or distances among partners (at a firm level) can be a major problem in managing international strategic alliances (Datta, 1988; O'Reilly, 1988; Lane and Beamish, 1990; Baird, Lyles and Wharton, 1990; Swierczek and Hirsch, 1994; Shaughnessy, 1995; Sweeney, 1996). Similar cultural values can reduce misunderstanding between cooperative partners and culturally distant alliances experience greater difficulty in their interactions (Brown, Rugman and Verbeke, 1989; Lane and Beamish, 1990). The more culturally distant two firms are the greater the differences in their organizational and administrative practices, interpretation, and response to strategic issues will be (Kogut and Singh, 1988; Schneider and De Meyer, 1991). Communications between culturally distant partners can be difficult, consequently leaving the alliances vulnerable to managerial conflicts and early dissolution (Camerer and Vepsäläinen, 1988; Lane and Beamish, 1990).

Finally, based on Hofstede's framework, Swierczek and Hirsch (1994) built an Asian frame of reference on multicultural management. Figure 21 shows the characteristics of Western and Asian business basic values (Toral 2000: 59-60).

Figure 21: Western and Asian Basic Values



Source: Based on Swierczek, F. and G.Hirsch (1994). "joint ventures in Asia and multicultural management", European Management Journal, 12 (2), pp. 197-209.

Although the research objective of this dissertation does not focus on cross-cultural issues (and the empirical investigation is to be carried out among the Chinese institutions which operate in a similar cultural environment) cultural difference is, however, regarded as an important aspect of this study. The empirical investigation tries to determine what are the most important cultural differences between partners which impact the NWs' building process, in terms of a broker's handling of these cultural issues in the cases where different cultural dimensions are involved.

2.4.3.3 Relationships, Guanxi and Trust

According to Hakansson and Snehota (1995) a relationship is a consequence of an interaction process where connections have been developed between two parties that produce a mutual orientation and commitment. A relationship is a variable that can take on different values. In order to capture the variety of business relationship Hakansson and Snehota (1995:26-28) proposed two dimensions: **substance** and **function**. The first dimension consists of three different layers: **1) the activity layer**, a relationship that is built up of activities that connect various internal activities of the two parties; **2) the resource layer** which, as a relationship develops, can connect various resource elements needed and controlled by two companies. Relationships consist of various degrees of resource ties. A relationship makes various resource elements accessible for the parties and also constitutes a resource that can be used and exploited; and **3) the actor layer** that, as a business relationship develops, makes the actors connects. Bonds established between actors affect how the actors perceive, evaluate and treat each other. These three layers add up to a relationship between two companies that can be characterized by the relative importance of the three layers.

The second dimension according to Hakansson and Snehota (1995), regards the effect a relationship has for different actors. A relationship between two companies has different functions because it affects and is affected by different parties and other relationships. Three different functions are distinguished. **1) Function for the dyad:**

this originates in the conjunction of the two companies; their activities, resources and actors. Activity links, resource ties and actor bonds in a relationship integrate various elements and thereby some unique outcomes and effects are produced. **2) Function for the individual company:** a relationship has effects on each of the companies, on what it can do internally and in other relationships. **3) Function for third parties:** being a building element in the larger NW structure, what is produced in a relationship can affect and is affected by other relationships that involve other parties. “Today, the competitive challenges of organizational growth, globalization, and expansion through strategic alliances, the ability to effectively develop and maintain strategic partnerships and alliances among competitors (Kanter 1994, Hamel and Prahalad, 1994) and multicultural /multilingual relations (Cox and Tung, 1997) has become a critical competence and a corporate asset.” Kanter (1994) defined it as the “collaborative advantage.” According to Kanter (1994) a well-developed ability to create and sustain fruitful collaborations in the global economy gives companies a significant leg-up. An alliance has three fundamental aspects. First, they must yield benefits for the partners as long term living systems that evolve progressively in their possibilities. Second, both partners deem successful, involved collaboration as needed, rather than mere exchange - and partners value the skills that each brings to the alliance. Third, they require a dense web of interpersonal connections and internal infrastructures that enhance learning (Toral, 2000:66).

Furthermore, Kanter (1994) described that relationships between companies are similar to relationships between people and outlined five overlapping phases: 1) **courtship:** in the phase of courtship, two companies looking for compatibility, capability and commitment⁷ meet and are attracted to each other (Cauley de la Sierra, 1994). To be successful in this stage each company must do a deep self-analysis. Relationships get off to a good start when partners know themselves and their industry. Chemistry is another factor influencing this stage; deals often turn on rapport between chief executives. Spekman, Isabella, MacAvoy, and Forbes, III (1996) found that there is an inextricable linkage between the business of the alliances and the interpersonal relationship between the key alliance players. The courtship period will test compatibility on broad historical, philosophical, and strategic grounds, common experience, values and principles, and hopes for the future. While analysis examines financial viability, leaders can assess the less tangible aspects of compatibility; 2) **engagement:** through engagement, two companies draw up plans and close the deal. What starts out as personal rapport, philosophical and strategic compatibility, and shared vision between two companies’ top executives eventually must be institutionalized and made public. Meeting the family: the rapport between chief executives and a handful of company leaders must be supplemented by the approval, formal or informal, of other people in the companies and of other stakeholders. Also, each partner has other outside relationships that need to approve of the new tie. Third-party professionals, lawyers, and investment bankers and their staffs play their most important roles at this point in the process. Their dominance can depersonalize the relationship and diminish the vision of the leader; 3) **discovery of differences:** the newly partnered companies discover they have different ideas about how the business should operate. As actual projects get under way, a broader involvement of people from both originating sides of the organization takes place. First, people in other positions may not experience the same attraction and rapport as

⁷ Compatibility (ability to work together), capability (complementary strengths and resources) and commitment (medium-long-term willingness to cooperate) (Cauley de la Sierra, 1994).

the chief executives did. Second, employees at other levels in the organization may be less experienced in working with people from different cultures. Third, usually only a few staff people are dedicated full-time to the relationship. Others are evaluated on the performance of their primary responsibilities and therefore often neglect duties relating to the new alliance. Operational and cultural differences emerge after collaboration is under way. All operational dissimilarities require working out. Frequent communication is necessary. Companies that are good at partnering take time to learn about the differences early and consider them as events unfold. Respect versus resentment: people will take the time to understand and work through partnership differences to the extent that they feel valued and respected for what they bring to the relationship. Mistrust, once introduced, sets off a vicious cycle. Respect that builds trust begins with an assumption of equality: all parties bring something valuable to the relationship and deserve attention; 4) **bridging differences**: Kanter (1994) explained “active collaboration takes place when companies develop mechanisms – structures, process, and skills – for bridging organizational and interpersonal differences and achieving real value from the partnership. Multiple ties at multiple levels ensure communication, coordination and control. The most productive relationships achieve five levels of integration.” The first is strategic integration, involving top leaders to discuss goals or changes. The second is tactical integration, bringing middle managers together for specific operational tasks. The third is interpersonal integration, uniting individual’s willingness and efforts to joint operations. The fifth level of integration is cultural integration, bridging differences between the people involved; and 5) **internal change**: each partner discovers that as a result of its accommodation to the ongoing collaboration it has changed internally. Productive relationships usually require and often stimulate changes within the partners. Learning and borrowing ideas from partners is part of realizing the full value of the relationship. Since collaborative ventures often make new demands, managers involved in the relationship must be able to vary their own companies’ procedures to make venture- specific decisions. Firms with strong communications across functions and widely shared information tend to have productive external relationships. Other desirable internal changes include greater cross-functional teamwork and exchange of ideas (Toral 2000).

The critical aspects of networks of relationships in shaping the outcomes of organizing efforts have been shown by Paul DiMaggio (1992) and Krackhardt (1992). Faulkner (1983) and Jenkins (1983) explained how crucial networks of relations are to the entrepreneur’s search for information in the creation of new ventures. Finally, Nohria (1992) emphasized that careful attention must be paid to the pattern of relations that exist in a social system, because the relations serve as the pathways for information flows that facilitate search and enable the production of trust and the governability of the system.

In China, ‘**Guanxi**’ is considered as fundamental in directing social and personal behavior (Ahmed and Li, 1996). The literal meaning of Guanxi is relation. It is used variously to refer to the relationship between people or organizations and includes connotations which implicitly indicate assurance, understanding and mutual obligation between parties. It governs a wide range of Chinese attitudes and behaviors which manifest in the building of long-term social and business relationships. The use of Guanxi can be seen in various aspects of alliance activities for example, as Davies et al. (1995) highlighted a number of benefits that can be derived from Guanxi. For

instance, it can serve as an information gathering mechanism on market trends and business opportunities, act as a means of securing access to important resources in many forms and is often used to enhance company reputation and image. Broadly speaking, Guanxi features quite prominently in the smooth running of routine business operation. Guanxi can contribute to the building and enhancement of competitive advantage. Guanxi can serve to open doors where once they firmly shut. However, one has to be careful not to equate it with corruption or nepotism as some Western commentators have done. Careful scrutiny reveals that Guanxi is more akin to public relations practiced in the West, with the major difference being that its focus of concern is upon building interpersonal relations (Ambler, 1994, Ahmed and Li 1996). In handling the matter of Guanxi it should be appreciated that Guanxi relates predominantly to personal relations highlighting the fact that Chinese exchanges are not solely commercial, but social as well. These exchanges need to be handled with sensitivity. Due to the pervasive nature of Guanxi, no hard and fast rules of thumb exist to foster it. However, once generated, Guanxi will, among other things, help managers to work behind the scenes to obtain necessary support in the implementation of both strategic and operational plans (Ahmed and Li 1996:284).

Trust and Trustworthy Behavior – “The central theme in economic sociology is the necessity of trust and trustworthy behavior for the normal functioning of economic action and institutions” (Granovetter, 1992:38).

Effective relationship management to build collaborative advantages requires managers to be sensitive to political, cultural organizational and human issues. Trust is an important variable that plays a determinant role in this process. In inter-firm relationships, researchers credit trust with lowering transaction costs in more uncertain environments (Noordewier, John, and Nevin, 1990), thereby providing firms with a source of competitive advantage (Barney and Hansen, 1994). Trust also facilitates long-term relationships between firms (Ganesan, 1994; Ring and Van de Ven, 1992) and is an important component in the success of strategic alliances (Browning, Beyer, and Shelter, 1995). Within organizations, trust contributes to more effective implementation of strategy, greater managerial coordination (McAllister, 1995), and more effective work teams (Lawler, 1992), (Toral, 2000:69).

Any transaction in which the performance of the two parties is separated by time involves an element of “trust” (McPherson, 1984:74; Granovetter 1992:38; Dyer and Ouchi 1993) and trust may then even turn out to be a competitive advantages to the partners when succeeding to reduce the costs of control under a certain level (Barney and Hansen 1994). Studies undertaken by Kumar (1996), Mohr and Spekman (1994) have shown that high level trust systems produce up to 78 percent more sales and improve the overall performance, in terms of profitability, by up to 23 percent.

The importance of trust is particularly striking in the case of mutual or unilateral distrust. Partners go to great lengths to protect themselves, wasting precious resources and strangling unexplored potential. The cost of transactions rises, and the benefits of cooperation are diminished or even eliminated (Jarillio 1993; Urban and Vendemini 1992). Kumar estimated that the enhancement of trust in cooperative systems could reduce the excess costs of the US supermarket industry alone by \$30 billion (Hirsch 1997).

Numerous definitions of trust have been presented in the literature (Handy 1996, Sydow 1992). Most attempts share the same approach which leads to an adoption of the following definition (Barney and Hansen 1994) “Trust is the mutual confidence that no party uses gains from the relationship to the other party’s disadvantage.” Once

trust is established it frees potentials for more efficient operations. Group theories suggests that trusting partners are more motivated to interact (Handy 1996), communicating more informally across hierarchies, and tend to place the objective of 'getting things done' above protective efforts (Krackhardt and Hansen 1993). Applied to the NW trusting communication brings along benefits 'off the schedule', i.e. advantages that cannot be produced in formal frames. Such conveniences can be informal advice from an objective partner (Heimer 1992; Krackhardt and Hansen 1993) or eased mediation in times of conflict (Bronder 1992; Hirsch 1997:48-49). Barney and Hansen (1994) and Grunwald (1995) characterized the importance of trust as: 1) essential factor for interaction, 2) mean of relational efficiency and 3) basic condition for the cooperative spirit that justifies NWs, due to its diminishing effects on transaction cost. To recognize trust as an essential factor and to manage it as such has to be the prime task of NW managers (Hirsch 1997:48-49).

Trust has been suggested by social psychologists as a variable that mostly and thoroughly influences interpersonal and intergroup behavior (Golembiewski and McConkie, 1975). **"A consequence of trust is cooperation."** The formation of a strategic alliance yields evidence of this. Trust is likely to be reciprocating if one party takes the initiative to exercise trusting behavior. Matthews and Shimoff (1979) discovered that trust decreased when the likelihood of reciprocation is reduced and, accordingly, the likelihood of future cooperation (Osland and Yaprak, 1993). Economists perceive trust as a public good that acts as a social lubricant to make production and exchange possible (Dasgupta, 1988). In the presence of reasonable alternatives **trust is a precondition of cooperative behavior**. The logic of transaction cost analysis (Ouchi, 1980; Williamson, 1975,1981) helps the role of trust in strategic alliances. Williamson's work, concerned with the cost of an exchange, would indicate that costs are incurred in four situations: 1) reaching an agreement satisfactory to both sides, 2) adapting the agreement to unanticipated contingencies, 3) enforcing the terms of agreement, and 4) terminating the exchange agreement. The costs are linked to the assumption that firms behave opportunistically. Opportunism implies guile, whereby one exchange partner is interested in promoting his own self interest to the potential detriment of the other (Spekman and Strauss, 1986). **A considerable amount of expense can be avoided if there were complete mutual trust** (Lorenz, 1988). Contracts are a feature of most strategic alliances because firms do not completely trust one another, at least initially. However, not all contingencies can be covered in legal contracts, and human rationality is limited. Therefore, some level of trust is still necessary (Lorenz, 1988).

Trust is crucial when firms invest in specific assets. These transaction-specific investments are highly specialized to the alliance, are not re-deployed easily, and may have little salvage value. They include durable assets such as expert knowledge and technical or human skills (Spekman and Strauss, 1986).

The low level of trust leads to less favorable communication, attitudes, and bargaining behavior (Schurr and Ozanne, 1985) and that trust develops incrementally over time. A present-tense perspective of past behavior indicates a willingness to engage in future cooperative actions. That trust is an antecedent to cooperation is supported by many social psychologists' experiments (Axelrod, 1984; Deutsch, Canavan, and Rubin, 1971; Good, 1988; Matthews and Shimoff, 1979; Yamagishi and Sato, 1986). Hallen, Mohamed, and Johanson (1989) discovered a positive relationship between the two constructs in international business. When physical and cultural distances separate firms the building of trust is an essential ingredient for successful

cooperation. In several Asian countries trust and friendships may replace extensive formal contracts (Ford, 1980; Thorelli, 1986).

In transaction cost economics (Williamson 1985) the basic problem is to understand when market transactions are replaced by transactions governed by authority mechanisms. In relational contract theory (Macaulay 1963, Macneil 1980) and the interaction model (Hakansson 1982,1987), the importance of building personal trust relationships is underlined. Hakansson and Snehota (1995:369) argued that authority and trust represent two different modes of governance. However, these two modes can be combined in many different ways (Bradach and Eccles 1989). Trust can act as a governance mechanism for embedded relationships (Uzzi, 1996).

Trust is an attribute of a relationship, but trustworthiness is an attribute of an individual actor involved in the relationship (Barney and Hansen, 1994). Since trust can induce joint efforts (Gambetta, 1988; Ring and Van de Ven, 1994) a trustworthy actor is likely to get other actor's support for achieving goals (Tsai and Ghoshal 1998:465). More recent researchers have found that excessive concern with control can be counterproductive (Lorange and Roos, 1992), that management of alliances should be conducted with attitudes and interpersonal relationships (Faulkner, 1995), and that attention should be paid to issues of trust (Barber, 1983; Killing, 1988; Lorenz, 1988; Palay 1984; Nooteboom, Berger and Noorderhaven (1997:309).

According to Ahmed and Li (1996:280), the Chinese attempt to have trust building communication first. Contrary to the Western preference of a quick opening that leads directly into the main transaction, Chinese negotiators 'get down to business' only when they feel that the relationship is well anchored.

Jarillo (1993) raised the prisoner's dilemma as a good formalization of the basic problem of lack of trust. In spite of the obvious benefit of cooperation there is a strong temptation to default and take a larger benefit. **Trust cannot be imposed. It has to be earned.** Developing trust may imply a long-term process (Jarillo 1993:145).

"Trust as noted before, is not a monolithic state. Rather than that, it was portrayed as a process, involving a subject and an object. A description should consider the general dimensions of activities which concern the actors, the content of their acts and their immediate environment. The subject in the process – the trusting party – is acting in uncertainty and risk of the other party's reaction. It is providing the first efforts that is lacking legal or contractual base for reciprocal service. It further renounces control, voluntarily or under pressure, of resources, the course of action and particular events while being fully conscious of the direct or indirect dependence on the other party. The act of trust is motivated by anticipation of future benefits and the expected reduction of social and economic complexity" (Barney and Hansen 1994; Burt 1992; Grunwald 1995; Krackhardt and Hansen 1993; Sydow 1992), (Hirsch 1997:50).

"The act of trust tends to increase the vulnerability of the actor in favor of a person, a group or an organization that is not situated under the direct control of the actor. The situation, in which the act takes place, may imply higher negative effects to the trusting party than the expected benefits" (Grunwald 1995). The trusted party is considered to deserve the act if it is evaluated as trustworthy. An exchange partner is trustworthy "when it is worthy of the trust of others. An exchange partner worthy of trust is one that will not exploit other's exchange vulnerabilities" (Barney and Hansen 1994: 176). Grunwald (1995:74) described a behavioral pattern of ten elements for a person who is considered to be trustworthy: 1) behavioral consistency, predictability, reliability; 2) keeping promise; 3) fairness in interaction; 4) loyalty; 5) integrity; 6) discreteness; 7) openness; 8) responsiveness; 9) competence and 10) physical presence and attainability (Hirsch 1997:51).

Granovetter (1992) notes that trustworthiness can increase considerably if the NW has a high density, i.e. is intensively interrelated. Trusting can ensure the working in favor of cooperation and that any offence will be reported directly. It has, however, to be noted that the number of persons that can be trusted is limited by the “social capacity” of an individual or a group “to know and to try to understand other individuals or groups” (Burt 1983:83). One person is hardly able to know more than fifty persons at the same time and increasing the number will limit the intensity of existing relations (Hirsch 1997: 50,51).

A trusting relationship between two parties implies that ‘common goals and values have brought and kept them together’ (Barber, 1983:21). Sitkin and Roth (1993:368) maintain that trusting relationships are rooted in value congruence - the compatibility of individual’s values with an organization’s values. With collective goals and values organization members are inclined to trust one another, as they can expect that they all work for collective goals and will not be hurt by any other member’s pursuit of self-interest. Trust has been viewed as an aspect of organizational context and as an antecedent of cooperation (e.g., Gambetta, 1988; Gulati, 1995; Ring and Van de Ven, 1994).

Bradach and Eccles have claimed that, “trust is a type of expectation that alleviates the fear that one exchange partner will act opportunistically”(1989:104). “As trusting relationships develop inside a NW, actors build up reputations of trustworthiness that may become important information for other actors in the NW. It is reasonable to expect that a trustworthier actor is more likely to be a popular exchange partner for other actors in the NW. Consequently, it is argued that differences in the level of trustworthiness may result in different levels of resources exchange and combination between both organizations and different units of the same organization” (Tsai and Ghoshal 1998:466,467).

The literature of relationship and trust in this section stimulated several leads in the later investigation regarding: the relationship pattern between actors affecting the NW building process; the role of trust between the NW participants and, in particular, the trust building efforts of the brokers in relation to the NW building process.

2.4.3.3.4 Learning

“Organizational learning is the process by which the organization’s knowledge and value base changes, leading to improved problem solving ability and capability for action” (Probst and Büchel, 1997). The concept of learning originated in psychology and focused on learning at the individual level (Probst, Büchel and Raub (1996). Behavioral psychologists defined learning as a behavioral change of individuals, (Hilgard and Brower, 1996). Later, learning theorists emphasized cognitive processes as key determinants of individual learning (Bandura, 1986). Cognitive psychologists focused on change in the state of knowledge, which creates the potential for changing behavior. “The organizational learning concept has transported the idea of individual learning to the organizational level where the same distinction exists between behavioral and cognitive learning process” (Inkpen and Crossan, 1995). Changes in behavior without corresponding changes in cognition, or vice versa, are transitional states since they create a tension between one’s beliefs and one’s actions. This tension can only be resolved by integrating a change in behavior with a change in cognition so beliefs and actions are in accordance with each other. Organizational learning increases the organizational knowledge base, which leads to the enhancement of the

problem solving potential of a firm (Probst, Büchel and Raub, 1996; Toral 2000:22,23).

According to Inkpen (1995) an important factor which explains the reason of the strategic alliance trend is that cooperation provides a platform for organizational learning, giving partner firms access to the skills and capabilities of their partners (Hamel, 1991; Kogut, 1988; Westney, 1988). Viewing alliance as learning opportunities provides an alternative to mutual alliance value creation. Huber (1991) referred to this process as grafting, the process by which organizations increase their knowledge capacity by internalizing knowledge not previously available within the organization. In an alliance, organizations are brought together because of their complementarity and their differences. The differences in partner skill areas are the fuel for learning. Whether or not the differences are identified and internalized determines whether learning occurs. There is a growing body of theoretical research (Kogut, 1988; Pucik, 1991; Westney 1988) and empirical studies (Dodgson, 1993; Hamel, 1991; Simonin and Helleloid, 1993) addressing the issues of alliances as mechanisms from organizational learning. This stream of research has begun to address some of the important questions associated with how organizations exploit collaborative learning opportunities” (Toral 2000:23). Powell and Brantley (1992) suggest that NWs are particularly suited for rapid learning and flexible deployment of resources.

Having presented the behavioral properties of NW actors, the coming sections present literature concerning the role distribution in a NW. The special emphasis is on the broker role and behavior in the different types of NWs during different stages of their life cycles namely, how strategies are made and implemented by the brokers.

2.4.3.4 Role Distribution in a NW

Section 2.4.1 introduced literature concerning actors and actors who are theoretically called ‘brokers’. This section focuses on the attribution of the activities on the actors, namely, the actors’ roles and behaviors in the NW. Special light is shed on the brokers’ roles and behaviors in the NW building process.

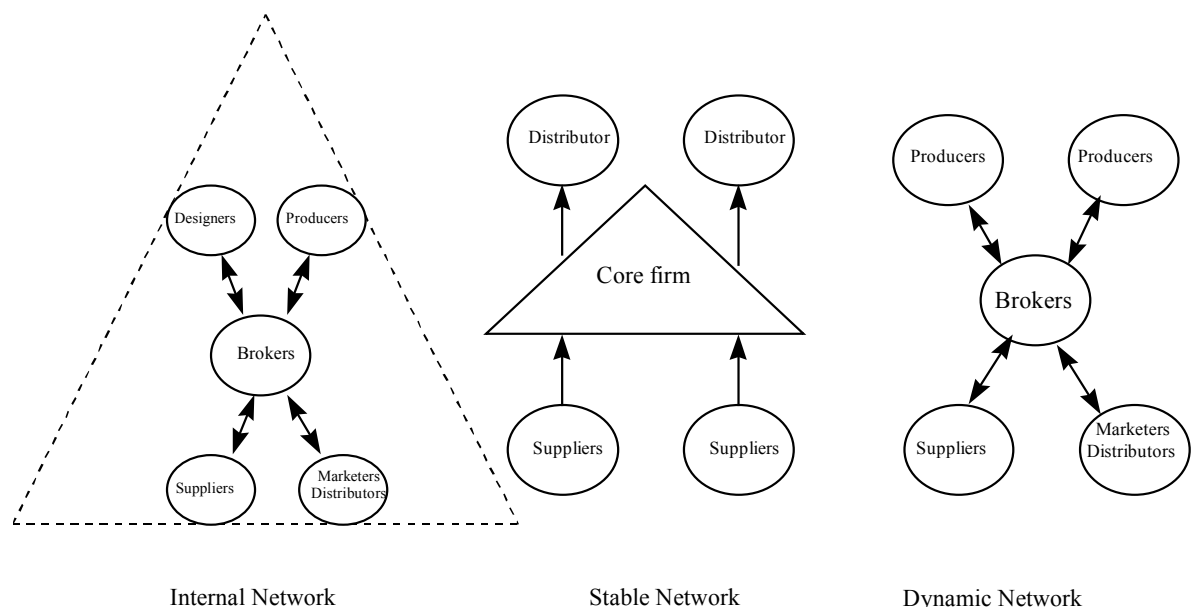
Nadel (1957), Merton (1957), Homans (1967), and Goodenough (1969) have discussed social roles and social positions in ways that are useful for social NW analysis. Wasserman and Faust (1994:462) further reviewed these authors’ idea and theoretical notions to be used in studying roles and positions in social NWs. According to them, theoretical definitions of social roles are often stated as properties of individuals or sets of individuals. This usage is apparent in a statement such as “a person takes on the role of leader in a group.” Homans (1967:11) defined role as “...the behavior expected of a (person) occupying a particular social position. In contrast to social position, which refers to a collection of actors, the concept of social role refers to the ways in which occupants of a position relate to occupants of other positions.” In translating these theoretical ideas into formal NW analysis methods it is useful to keep in mind the distinction between a collection of actors (a social position) and the ways that these actors relate to each other (a social role). Goodenough (1969) made important distinctions between **status, position, and role**. He argued that the fact that many authors have not carefully distinguished between status and position has led to unfortunate confusions. And further, he defined the role for a social identity: “The aggregate of its composite statuses may be said to constitute the identity’s role

in a sense a little less comprehensive than but otherwise close to Nadel's (1957) use of the term. It would be equivalent to a comprehensive 'role set' in Merton's (1957:369) terms." Merton (1957:423) noted, "a particular social status involves, not a single associated role, but an array of associated roles." This collection of role relationships that an individual has with others, by virtue of occupying a particular social status, constitutes their role set. The idea of a role set is quite useful for defining individual roles in social NWs (Wasserman and Faust, 1994:462-).

Group theory regards the human being as a highly complex set of values, attitudes, expectations and needs that have to be respected in order to fully comprehend and effectively manage resources (Lundy and Cowling 1996). Organizations also contain corporate values and their expectations are embodied in their strategies. They seek the attainment of basic targets (such as profitability, development and recognition) in the system and on the market (Porter 1985). The fulfillment of these and other tasks is attained by personal networks which are formed by informal contacts between individuals. They transcend the boundaries of the single network members. Personal or rather informal NWs are "highly adaptive" and "move diagonally and elliptically to get work done" (Krackhardt and Hansen 1993), i.e. they adapt to the actual needs of the NW apart from existing hierarchies.

According to Bircher (1998), in a NW, different roles can be attributed to different actors. In function of the NW type the importance of various roles is different. Figure 22 illustrates that the designer's role is relevant for the innovation in the NW. The marketers and distributors maintain the contact with the customer, whereas one or several producers and suppliers are specialized in the product and in the production processes. Most of the role-oriented literature analyzes the activities of the broker, as does this dissertation. The broker is the coordinator, catalyzer and leader of the NW. In a stable situation a core firm can assume the broker's role. Figure 22 illustrates how roles are distributed to the actors in the three types of NWs presented previously in section 2.3.2.2.4.

Figure 22: NW Types and Roles



(Source: Snow/Thomas, 1993 in Bircher 1998)

2.4.3.4.1 Broker's Role and Behavior in a NW

This section presents both the static and dynamic aspects of the broker roles. Section 2.4.3.4.1.1 describes the **static aspects** of the broker as a single and collective actor. Section 2.4.3.4.1.2 presents the **dynamic aspects** of the brokers' roles along the developmental phases of NW building process.

2.4.3.4.1.1 The Static Aspects of the Broker's Roles

The role as **leader** of the NW refers to the broker's function as strategic manager of the NW. He develops strategies for the system as a whole, gives a meaning and objective to the NW and, due to his outstanding visibility,⁸ presents it to the outside world. This role concerns the interaction of the broker with the system's environment, i.e. the market, the competitors, etc. He appears as the 'linking pin' between the two elements, bridging eventual infrastructural gaps (Sydow 1992). Miles and Snow (1978) suggested a distinction into four types. 1) The **defender** type that operates as an expert on a narrow market while seeking a competitive edge solely by improving efficiency; 2) the **prospector** who continually searches for market opportunities and acts hence as a creator of change and uncertainty; 3) the **analyzer** who operates in two sorts of product market domain (in a **stable domain** where operation is routine based and efficient; and in the **turbulent field** where the manager depends on inspiration from competitors which he turns swiftly into reality); 4) the **leader** can act as a **reactor** perceiving change in his function as representative to the outside, acting as the NW's 'gatekeeper' - overseeing the information that leaves the system (Badaracco 1991, Hirsch 1997:25).

The roles of **rule setter and capability builder**, for the broker, are to focus inside the NW. These roles concern the climate in the NW of capable and trusting partners. They are strongly linked to the evolution of the system and develop parallelly (Lorenzoni and Baden Fuller 1995, Sydow 1992). In his rule setting function the broker prescribes the structure of the NW that concerns the criterion and enrolment of NW members, obligatory and disciplinary systems. The broker's job includes partner selection, contract prescription, interrelation and crises management.

By selecting, integrating and interacting with partners, the broker configures the NW through factors such as the allocation of autonomy to single members, the degree of interdependence and of competitiveness in the NW. The long-term success requires a right configuration. Opportunism of the members increases if too much autonomy is allocated and their will to commit themselves decreases. Contrarily, members would lack motivation and productivity would also decrease. Likewise, interdependence turned out to be an important factor for NW efficiency and knowledge management, while an excessive interdependent NW withdraws itself from the coordinative instruments of the market and increases the single members' vulnerability (Mohr and Spekman 1994). During routine functioning, the broker has to develop means of control and motivation for the NW. Most of the control will be prescribed in the contracts, but implementation of managerial instruments remains a permanent challenge. Control is limited by the member's strive for autonomy and the eventual desire to manipulate the data. Additionally, the broker has a limited capacity to thoroughly grasp the information that is enclosed (Partch 1991).

⁸ Visibility is the attribute of being an identifiable member of the NW (Heimer 1992; Sydow 1992).

Motivation in NWs is a similar complex phenomenon. The broker may act on the structural as well as on the individual level. By configuring the level of competition, for example, he may achieve an increase in ‘market-level’ motivation (Quinn and Hilmer 1994), thereby forcing weaker but nevertheless valuable members to exit the system. NW managers tend to create an atmosphere of ‘quasi-competition’ in the NW, i.e. incorporating technically equivalent but functionally complementary companies (Sydow 1992)⁹. Once the links are established the broker can regulate the work by supervising and interfering in the quantitative and qualitative exchange. Typical examples of relational defaults are the frequency and quality of communication and workflow. The intervention should always be guided by the knowledge that the system is only as strong as its weakest link. To facilitate the task, the broker should design clear rules for interactions that serve as guidelines and clearly strengthen the relationships (Barney and Hansen 1994).

The broker’s role as a **capability builder** is to “develop the core skills and competencies of partners to make them more effective and competitive; force members to share their expertise with others in the NW, and with the central firm” (Lorenzoni and Baden-Fuller 1995). The definition of the capability builder implies the transfer of core knowledge and ideas, the input of further discoveries - such as acquired patents and recent results of the product development activity - and the permanent lobbying for knowledge sharing.

The role as ‘**creator of value**’ consists of the previous two roles as ‘leader’ and rule setter and capability builder’ with two major implications: 1) it is not enough for the broker to rule the NW in technical terms. Rather, she or he has to live by his or her own prescriptions and constitute a ‘good example’ to his or her partner as well as contributing his or her operational share to the value creation process (Lorenzoni and Baden Fuller 1995). 2) The functioning of a strategic NW demands that the partners actually play their role as creators of value. If the members of the system fail to follow, all leadership, rule setting and capability building efforts of the broker will remain “bones without meat” (Hedberg, 1996:63). Strategic NWs require the cooperation and alignment of the partners. The role as ‘creator of value’ has to be played by all partners as a prerequisite, for the functioning of strategic NWs replaces the almighty core company with a coordinative power that is sets the framework for common action. Most brokers produce or deliver units that are integrated in the productive process. In addition to his or her multiple tasks of NW management, he or she is bound to act also as a common player in his or her special function. The broker, as an ordinary member in the NW, has to fulfill the tasks as a link in the chain. These tasks include: 1) delivering products or services in agreed or superior standards; 2) continually scanning the interior and exterior market of the NW for innovation possibilities and share the expertise; 3) communicating frequently with direct links to facilitate work flows and improve quality; 4) contributing to the atmosphere of trust and help to sanction mischief-makers and 5) balancing individual and collective utility of his or her unit (Jarillo 1993; Lorenzoni and Baden Fuller 1995; Sydow 1992). Galbraith (2000) stated that the coordinating role is the next level of complexity in lateral organization and that at some point the groups may require some full-time leadership; in order to achieve time to market, product teams probably require full-

⁹ This argument is based on the hypothesis that a NW with a low degree of competitiveness develops into a relation between monopolists. Due to his or her position of strength as a monopolist in his or her activity, a partner is more likely to dispute and not to respect the recommendation of the broker (Burt 1992).

time, new-product managers to convene the groups and resolve cross-unit conflicts. These leaders are referred to as **coordinators or integrators** (Lawrence and Lorsch, 1967; Galbraith, 1973). They often have titles such as project manager, program manager, product manager, worldwide business manager, global account manager, process owner, or brand manager. They all have two characteristics in common. First, they have the portion of the general manager decision capacity and guide the lateral groups in their activities. Second, they execute their role without any formal authority, which resides in the line organization. Implementing the coordinating role is more expensive than implementing the previous lateral forms of organization because it involves hiring a group of people whose task is to integrate the work of other people; when extensive information is needed, coordinating departments may be created. The cost is incurred in addition to the cost of voluntary and formal groups of various types. The coordinator role is also difficult to execute because of the conflicts it generates. Top management must adopt a resolution process to handle these inevitable conflicts on a timely basis. When creating coordinating roles, the organizational designer must select and develop candidates who can influence without authority. The designer should also create additional power bases, other than authority, to augment the personal skills of the coordinator (Galbraith 2000: 114). The NW manager, in addition to his conventional roles, has to engage further in 'boundary spanning'- roles that "serve to functionally relate the organization to its environment" such as the negotiation of contracts and control of their execution, the representation and protection of NW members or the motivation and control of NW members (Sydow 1992).

"The four-dimensional approach in this section to the broker as 'leader', 'rule setter', 'creator or value' and 'coordinator' describes him or her from a static point of view. The roles, however, are dynamic in function of the NW's development" (Sydow 1992). Given the growing use of NW organizations, it is important to achieve a better understanding of how the broker's behavior during the NW building process is linked to NW performance (Snow, and Thomas 1993:220).

The next section presents the literature concerning brokers' roles and behaviors in each developmental phase of the NW building process.

2.4.3.4.1.2 The Dynamic Aspects of the Brokers' Roles

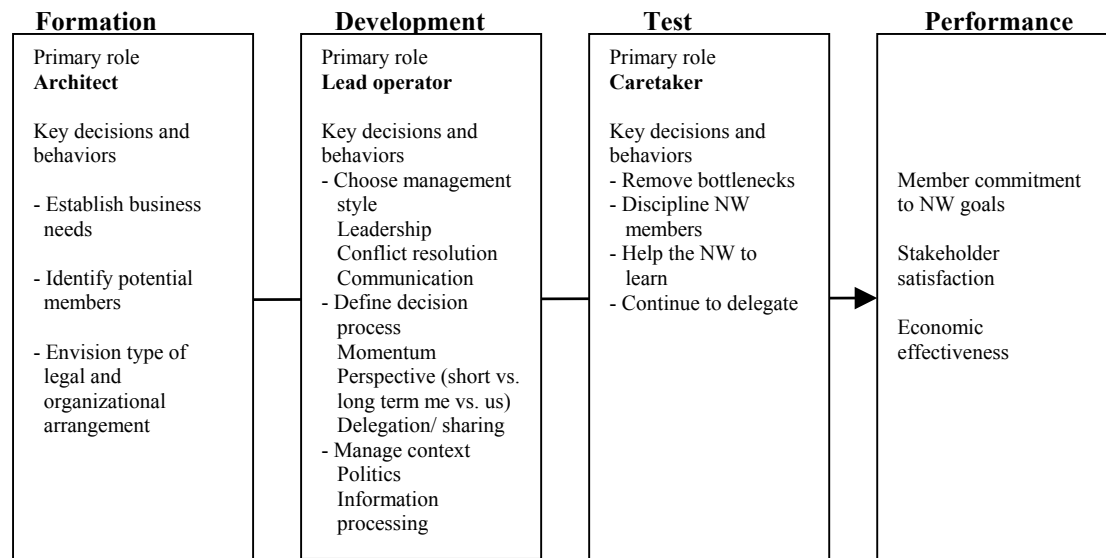
As stated in section 2.3.2.2.4 the three types of NW (internal, stable and dynamic NWs) developed by Snow and Thomas (1993) were opted as the NW model for this study. Accordingly, the presentation of literature concerning broker's roles in this section proceeds along the three developmental phases of NW building process. The NW cycle starts with the first links established by the broker which develop to a reciprocal relationship between the broker and his partners later in the system's lifetime. Before and during routine operations, relations emerge that are independent from the broker (Lorenzoni and Ornati 1988).

According to Snow, Miles, and Coleman (1992), in many NW firms, brokers operate across rather than within hierarchies, assembling resources controlled by the outside parties. Three broker roles are especially important to the successful NW organizations: **architect**, **lead operator** and **caretaker**.

As an architect the broker identifies potential members, establishes a common business interests and formulates legal and organizational structures and rules for the

formation of the NW (to highlight the searching efforts by the brokers in relation to the formation phase, the **facilitator role** is specially presented before the architect roles). During the **development phase** of the NW the broker acts as a lead operator managing the NW's business development operation. In the **test phase** he or she primarily acts as a caretaker strengthening the NW ability to change and to adapt to new requirements by coaching and enabling the NW members. Figure 23 presents this NW building process in relation to the relationships among NW phases, broker roles, behaviors and performances.

Figure 23: Relationships among NW Phases, Broker Roles/ Behaviors, and Performance



(Source: Snow and Thomas "Building NWs, Broker roles and behaviors" in Lorange 1993:233)

2.4.3.4.1.3 The Facilitator Role for Search Process and Venture Creation

Organizational theorists have always been interested in explaining the factors that facilitate or impede organizing efforts leading to the creation of a new venture (Zaltman et. al, 1973; Drucker, 1985; Stevenson and Gumpert, 1985; and Nohria, 1992).

The importance of social relations and institutions in facilitating the search process in situations of imperfect information and uncertainty has been recognized for some time. Nohria (1992) furthered the knowledge of the role that various social institutions play in facilitating search under conditions of imperfect information. Piore and Sabel (1984) described an innovative institution, 'the 128 Venture Group,'¹⁰ which was designed to facilitate search by bringing together actors who are interested in creating new high-technology ventures on a regular basis to pursue their complementary interests. The creation of a new business venture requires solving a "combinatorial problem." (Baker and Faulkner, 1991:283). In the creation of new ventures, elements that must be combined - usually including someone with an innovative idea, a provider of venture capital, candidates for the venture's management team, and providers of

¹⁰"The 128 Venture Group" these actors include entrepreneur who seek to start or build a new enterprise, venture capitalists and others who want to invest in such enterprises, managers who aspire to become a part of such an enterprise's management team, and professionals who can provide a variety of services to new firms. The search for information is the principle reason participants come to this forum. The matters investigated range from identifying potential new business opportunities, keeping abreast of present and emerging technology and market trends, seeking out partners with whom one can collectively build a new venture, conducting due diligence to verify the quality of existing leads, to finding out what competition is doing.

professional and other support services. These actors do not come together all at once. Rather, participants confront a dynamic problem in which a changing combination of technical, capital, management, and support-service resources are required at different stages of a venture's building process. At the end of the life cycle of a venture, which has progressed through several stages of development, one will either find failure and dissolution or reorganization and success (Piore, 1986). When a venture succeeds a more professional management group may replace the venture's management team, and the initial venture capital replaced by traditional financing. And the participants who combined to create the venture are often again in search of new opportunities (Nohria, 1992:240, 241).

It is rather difficult to find others who can provide complementary resources on a timely basis for the participants in high-technology enterprises. Resources that need to be combined cannot be drawn randomly from four homogeneous categories labeled "technology," "capital," "management," and "services" (Nohria, 1992:242). The difficulties such as "legitimacy," "control" and "chemistry" in forming appropriate combinations result in a situation in which all actors have a mutual interest in finding appropriate matches (DiMaggio 1992:127). As in the matching markets (Sondak and Bazerman 1989), "finding people on the other side of the market whom you like, who also like you, is the heart of the problem facing the participants." It is difficult to know where to find partners with complementary resources. Therefore activities that turn on information – searching, monitoring, scouting, evaluating, testing, confirming, and deciding – constitute a large part of the everyday life of the participants in these settings. People attend the meetings of the broker to search for information. The broker has to offer those who attend its meetings more perceived informational benefits or gains than the effort they feel they have to expand (Nohria 1992).

DiMaggio (1992) proposed a model of three interrelated criteria to guide search for participants: 1) **classificatory criteria** to identify a set of potential participants; 2) **relational criteria** (the index of other's relations) to establish the trustworthiness of the participant; and 3) **emotional criteria** (generate face-to-face interaction) to decide whether they should pursue the interaction further. Nohria (1992) described the process that a broker facilitates the search for a broad range of information: finding "leads" that lead to a "match"; establish a valuable "NW contact"; learning of a technological development that had key competitive implications; getting some key "intangible" facts on a "deal being scouted"; "staying on top" and discovering major flaws in current plans during a reality "check" and so on. The broker's performance, with respect to the search for "matches," is of particular interest because that is the central concern in the creation of new ventures. Although the matches are not necessarily concluded at meetings arranged by the broker who, by doing so, provides assistance in identifying options or leads - some of which may ultimately result in matches after further investigation. "Since the cost of due diligence is considerable, the quality of "leads" has significant economic value. The broker can facilitate the search for matches and thereby help in the creation of new business ventures. Further, the different types of matches realized indicates that the broker works in a wide variety of search situations ranging all the way from the placement of a management professional to a major acquisition" (Nohria, 1992:249).

2.4.3.4.1.4 The Architect Role in the Formation Phase

NWs are initiated by someone who recognizes a need or opportunity and takes the initiative to share resources across firms - someone who sees beyond one complementary transaction to the benefits of a continuing interaction along the value chain - someone who envisions and articulates the shape of a broader collective of organizations with unique features for the market and mutual benefits for its internal members. Some individuals play an architectural role; they design the NW (Miles and Snow 1994:122). In the formation process the broker acts as an **architect** who has to facilitate the emergence of operating NWs. In this phase organizational design and partner selection are the major responsibilities of the broker, according to Miles and Snow (1994). "This step can only seldom be taken straightforwardly, solely in cooperation with very few partners with a fixed goal" (Bronder 1992; Kanter 1994). Mostly, a NW emerges like an eco-system that "gradually moves from a random collection of elements to a more structured community" (Moore 1993). "The architect starts with one of the elements. Either he has a vague concept of the product, service, or business system it requires or he possesses the resources and changes their configuration to align them towards a specific goal" (Snow and Thomas 1993). In this stage the ideal broker should be a 'pioneer,' i.e. a creative and highly motivated visionary acting flexibly and relying mainly on informal communication (Zuberbuhler 1989).

To some extent, the architect is like the entrepreneur who sees both market opportunity and the set of resources needed to respond to it. The architect may not only envision but even create the resources necessary to deliver a good or service, along with the relationships required to maintain these resources and guide their interactions. The role of NW designer may be simply to see, explain, and broaden the awareness of existing avenues for sharing resources creatively. In other instances the NW architect may actually envision the form and function of new NW elements and help the tools and linkages needed to operate. Snow and Thomas (1993:129,130) explain that brokers who act as architects facilitate the emergence of specific operating NWs. "In some cases, the architect may design a NW by conceiving how resources can be assembled into a brand - new configuration. The architect often has in mind only a vague concept of the product or service as well as the value chain required to offer it. This business concept is then brought into clearer focus as the broker seeks out firms with desirable expertise, takes an equity position in a firm to coax it into the value chain, helps to create new groups that are needed in specialized support roles and so on."

"The creativity of the broker is focused on the development of a clear business concept. It is the biggest challenge for him to articulate the vision of the NW and to demonstrate the advantages of joining the NW to potential members. Once the vision is established, the broker advances to the identification of partners. Identification implies attraction and selection of the potential NW members. Likewise, groups are established to support the upstart the NW" (Lorenzoni and Ornati 1988).

It is also recognized that organizing efforts involve identifying, persuading, and recruiting others to contribute to the objectives the brokers have in mind, and that the outcomes (in terms of who joins and who does not) can have a critical bearing on the success of the organizing effort. Organizational theorists such as Kanter (1983) have explicitly directed attention to the importance of the NW in relations where the brokers are embedded (Nohria and Eccles, 1992).

With several partners assembled, the broker may begin envisioning the legal and organizational arrangement (Urban and Vendemini 1992). “The considerations of the legal arrangement are guided by a risk assessment of each new member that is based on his expertise and credibility”(Lorange and Roos 1992). “The overwhelming roles in phase 1 are thus the ‘leader’ and ‘the creator of value’ but first signs of the ‘rule setter’ begin to emerge. It is in that stage, that the value for customers is to be implemented in the business system by differentiated choices based on customer information and cooperation with the newfound partners” (Moore 1993).

2.4.3.4.1.5 The Lead Operator Role in the Development Phase

Once the potential NW partners have been identified, emphasis shifts from design to decisions about operation. Brokers who act primarily as “lead operators” take advantage of the conditions previously created by the architects (the two roles may overlap considerably and may be played by the same person). The lead operator formally connects specific firms together into an operating NW. Although the lead operator role may require a manager to work with several different firms, the same function can be performed entirely within a single organization”(Snow and Thomas, 1993:220). Kanter (1994) called this phase as about “getting engaged” and setting up a common household.” The ideal manager for this phase should have developed from enthusiastic to highly realistic with a good sense for what is possible (Zuberbuhler 1989).

“The broker directs the setting up of the household. He has to pay particular attention to the choice of managerial style which refers to the implementation of types of leadership, communication and conflict resolution; and the definition of the decision process and the management of the context which refers to define a common routine for managing the NW” (Kanter 1994; Snow and Thomas 1993). The decision process defines the degree of power attributed to the broker over the NW. Finally, special attention has to be paid to the management of the context (Sydow 1992). The broker has to pay special attention to the particular needs, expectations and capacities of his new partners and link the individual interests to the collective interest. Among others, capacity building¹¹ is a concerned factor, “someone must take the initiative to hook together the correct elements to generate the appropriate quality and quantity of output and provide the connected elements an appropriate return. These connections among the best-suited NW elements may have to be made quickly and inexpensively. Thus, helping the NW organization function across company boundaries responsively and efficiently is the principal focus of the “cooperator” role” (Miles and Snow 1994:123).

Continuing on these lines, compared to traditional organizations, according to Snow and Thomas (1993:234), NWs pose special problems of political activity and information processing. Each NW member has a dual allegiance – to itself and to the NW. The broker must be sensitive to managing the development processes in such a way that individual as well as collective interests are taken into account. The lead operators must provide the members with information both in form and in amount that is suitable for the information-processing capacity of each NW member. Besides, the brokers must be aware of how the evolutionary process is unfolding for each NW

¹¹ In this phase, chances are that capacity building is exaggerated in terms of the amount or the technical level of information transferred risking to drown partners in information that is above their processing capacity (Snow and Miles 1992).

partner, therefore defining a management process for the NW that includes proceeding at a pace that is comfortable to all partners.

2.4.3.4.1.6 The Caretaker Role in the Test Phase

A smooth and effective NW requires continual enhancement. Snow and Thomas (1993:220) called these brokers, who focus on enhancement activity, “caretakers.” The caretaker role is multifaceted and may be just as important as the architects and lead operator roles to the success of a NW organization. A caretaker must frequently monitor a large number of relationships and be prepared to engage in a variety of behaviors, such as sharing information, nurturing smaller or newer NW members, and disciplining members’ wrong acts. “The enhancement of a NW requires continual attention and nurturing. The development of interactive competence among NW members is a task similar to the internal organizational development of team building and improving communication and coordination process between an organization’s work groups and operating units, the broker focuses on building interfirm teamwork skills. The NW development role also includes facilitating new member orientation and integration” (Miles and Snow, 1994:124). The ‘caretaker’ plays the role of ‘leader’, ‘rule setter’, ‘capacity builder’ and ‘creator of value’ during the test phase when NW members have to “learn to collaborate” by “changing within” or “applying for divorce” (Kanter 1994). The broker has to correct the mistakes of the previous two phases in order to manage the routine in such a manner that facilitates collaboration, incites necessary changes or dissolves the relationship (Gomes-Casseres 1994). He should, hence, ideally present a profile of a ‘strategist’ and ‘coach’ at the same time - uniting the positive aspects of a far-sighted visionary with the communicational abilities of a mature team player (Zuberbuhler 1989). The broker has to search the NW for bottlenecks and smooth operations. Scanning the system, he may also discover inimical behavior among the members that calls for disciplinary action (Krackhardt and Hansen 1993). The third phase includes the implementation of organizational learning in the NW by inciting knowledge sharing, creating feedback loops and facilitating informal communication (Lorenzoni and Baden Fuller 1995; Powell and Brantley 1992). Finally, as the NW stabilizes, the broker may consider delegating some of his roles. Partisans of delegation argue that power sharing increases innovation and motivation in the NW (Gronroos 1990 and Stewart 1994). Snow and Thomas (1993) suggested that the power configuration be done in function of NW dynamics and broker characteristics. A dynamic NW with a small but highly dynamic strategic center will aim at a less centralized structure than a highly dominant center in a stable NW (Snow and Thomas 1993: 220). In summary, the broker has to judge from NW and market conditions what degree of decentralization is desirable.

2.4.3.5 Broker’s Role and Behavior in Different Types of NWs

The management roles of architect, cooperator or lead operator and developer or caretaker are found in all types of NW organizations. However, the primacy of each role - the extent to which it becomes the crucial, continuing challenge - differs from one type of NW to the next (Miles and Snow 1994:119,125). These roles at work in stable, dynamic, and internal NWs are presented in the following sections.

2.4.3.5.1 Managing Stable NWs

Efficient operation is the key to success in the SNWs - the speed and efficiency with familiar partners interact and adapt as required to meet the demands of each new product or service collaboration (Miles and Snow, 1994:125). The key organizational task at Nike is to continue to fine-tune NW operations – to build more, and more efficient mechanisms to facilitate product flow through a value chain that Nike does not own, but for which it initiates cooperative activity that is responsive to market demands and that uses market mechanisms to connect and direct its various elements. At SNWs, the development role is almost built into the cooperating role. Because most interactions represent return engagements, Nike's earlier operating efforts have been aimed at developing effective linking mechanisms and relationships. Helping a new supplier build the competence to produce for Nike and others is not just a technical task but a relationship-building task as well. Further Nike's willingness to trust and share knowledge with upstream and downstream firms tends to be reciprocated, laying the foundation for creative new operating experiments and productive future linkages (Miles and Snow 1994:126).

2.4.3.5.2 Managing Dynamic NWs

"Long-term success is most likely to be the key architect's role in a DNW. The ability to envision not only the design of new products and services but also the rich array of potential partners that might be employed in their production dominates this type of NW." Dell (personal computer company), Novell (computer software), and Galoob (toys and novelties) are upstream and/or downstream partners who are constantly changing to meet the demands of new products or services, utilizing available capacity, and simulating or creating new patterns of cooperation. All of each firm's partners have many other partners of their own, each turning from one to another to fill its needs in a constantly shifting business environment. Leading firms in such NWs spend much of their time locating potential new partners -expanding the NW to ensure even greater responsiveness (Miles and Snow, 1994:126).

In service industries a similar dynamism is apparent, with firms at every point along the value chain taking part in the NW design role. For example, a motion picture sound-editing studio needs a global NW of production firms to keep its people and equipment fully utilized. So, too, does a firm providing advanced forms of computer animation such as 'Industrial Light and Magic.' Much of the motion picture industry reflects characteristics of a global DNW, one in which the search for new players and richer interactive potential is a constant challenge. In the DNW the various elements along the value chain are fully aware of their interdependencies and thus are motivated not only to connect quickly and easily, but also to ensure that their inputs are of highest possible quality. In other services industries, such as publishing and consulting, the contributions of firms all along the value chain are highly visible as well (Miles and Snow 1994: 126,127).

2.4.3.5.3 Managing Internal NWs

In the INWs the crucial management role is development – maintaining and enhancing the conditions under which commonly owned elements can interact through market forces instead of through constant appeals to managers higher in the hierarchy. At ABB, for example, the internal organizational design created three interactive components: (1) domestically focused national companies, (2) profit center

plants producing for both domestic and international distributors, and (3) globally focused business area teams placing plant output in markets around world. All of those organizational components interact in responses to market forces, and they exchange goods and services at market prices. Although such design has clear operating routines it is highly vulnerable to corporate interference. Periodic commands from corporate headquarters to move resources at other-than-market prices, for example, can damage internal guidance mechanisms – since profit performance is no longer a meaningful measure once market prices have been distorted or replaced. Unfortunately, many INWs have not drawn continuing development attention. Members at all levels do not get the assistance they need to understand the “economy” they are charged with operating. Furthermore, they may be forced to deal with intentional or inadvertent intervention by high-level managers. Therefore, according to Miles and Snow (1994:128), learning how to maintain the integrity of the market inside an INW may still be one of modern management’s most consuming challenges.

2.4.3.6 Major Challenges of NW Management

Hirsch (1997) sorted out five major elements of NW management from the literature for brokers: 1) selection of partners; 2) trust building; 3) knowledge sharing; 4) conflict management and 5) social positioning.

1) Selection of partners: Partner selection for strategic NWs develops from a simple two-dimensional (price and quality) decision from a dynamic multi-dimensional decision making process (Sydow 1992). The selection process as such is not a fixed procedure but changes in function of the NW’s development and acute needs which makes a differentiated analysis desirable.

There are several situations during the NW building process which require a broker’s efforts in searching for new members. First, in establishing a NW, several members have to be evaluated and incorporated into cooperative functioning. Second, as the system expands new expertise are needed. Finally, the broker may have to search new partners for the purpose of replacing a former member. Based on the common patterns which appear in case studies of successful broker companies (Bleeke 1994; Hedberg 1996; Jarillo 1993; Kanter 1994), Hirsch (1997) proposed three major steps of partner selection process. 1) An extensive self-analysis of the company and NW, its needs and its expectations, which permit the derivation of the ideal member’s profile; 2) an examination of the potential member(s) in function of the cultural and operational dimensions; and 3) that the broker should be able to match the results of step one and step two in order to clarify his preferences.

2) Trust building: Considerable transaction costs can be incurred to the NW due to opportunistic behavior, since fear incites bilateral protective efforts that limit the full exploitation of the NW’s potential (Sydow 1992).

Jarillo (1993) suggested that the broker can act on two variables: 1) the partners he chooses, and 2) the intrinsic situation of the relation. First, to carefully select the partners according to the different relationships, searching explicitly for colleagues he can relate to; second, the situation within the NW should be able to convince the partners that they are better off cooperating than acting opportunistically. Contractual arrangements aim at forcing partners to keep their promises. However, modern brokers are trying to find their way without highly complicated legal arrangement

limiting them to basic requirements through mainly oral agreements (Lorenzoni and Baden-Fuller 1995, Hirsch 1997:52).

Grunwald (1995) assumed that trusting expectations expressed in trusting behavior produce trusting reactions as a sub-form of Burt's 'social obligation to reciprocity' (Burt and Minor 1983), and vice versa. The broker should set the system on the upward spiral towards trust by their good example.

Axelrod (1984:100-120) further added four basic advises to the 'tit-for-tat' strategy. The broker, 1) should not attempt to be too clever; 2) should not be envious; 3) should never be the first to defect and 4), both cooperation and defection have to be reciprocated.

Perrow (1992) outlined some characteristics - all distinctive of small firm NWs (SFNs) – those that are more likely to generate trusting than self-interest-maximizing behavior in a group of firms:

- Sharing information on markets, technologies, pay scales, and profits of firms
- Sufficient similarity in processes and techniques among firms so that one can understand and judge each other's behavior
- Experience of getting helped by another firm
- Long-term relationships, though not ruling-out intermittent contacts
- Little difference among firms by size, power, or strategic position
- Rotation of leadership is required to represent a collection of firms
- Similar financial rewards to the firms and the employees within them
- Firms collectively experience the economic advantages of increased sales and profit margins
- An awareness of a bounded community of fate generated by trade or professional associations, municipal service groups, unions, and the like

Where these conditions exist, the possibility of trust increases.

3) Knowledge sharing: Brokers in strategic NWs expect their partners to be creative. Studies show that exchange of knowledge as an incitation to creativity, innovation, efficiency, and overall satisfaction (Jarillo 1993; Lorenzoni and Baden-Fuller 1995; Mohr and Spekman 1994). However, the arising issue is how to assure the exchange of knowledge without putting the organization's core operations at risk (Jarillo 1993). Most strategic alliances end because one partner has taken over the competitive secret of the other. In only 51 per cent of the cases they studied did both sides gain from the alliances (Bleeke and Ernst 1995). Typically, the 'unwary' partner was 'hollowed out' to the advantage of the one who became a more powerful competitor (Jarillo 1993). Successful cases are, for example, Nike (Lorenzoni and Baden-Fuller 1995; Hirsch 1997:59) and Toyota (Badaracco 1991).

The first step of NW knowledge management has to identify the core competencies which consist of skills that permit extraordinary performance in key domains or processes (Prahalad and Hamel, 1990; Quinn and Hilmer 1994; Hirsch 1997:60). In order to manage information flows in the NW the core competencies have to be identified clearly and placed in function of their competitive importance (Friedrich 1995).

Before the appropriate relation of trust is in place, the partners will be reluctant to transfer their core competences - creating a black box containing their secrets which are kept from the common information exchange (Lorange and Roos 1992; Hofstede 1991). Cheessbrough and Teece (1996) suggested indirect protection by dividing product development in two segments: 1) the autonomic innovations which can be pursued independently from the others (e.g. a new engine in a car), and 2) the

systemic innovations that demand adaptation of the whole product (e.g. an impact protection system for a car). Autonomic innovations can be transferred to partners since they are only of punctual value while systemic innovations touch the heart of the protection system itself.¹² Patents, allowing the partners solely to use them after permission, may protect core idea or core product. Legal protection of intellectual property does not permit the full use of this mean. Once secrets are known they are mostly easily imitable and do not constitute a competitive advantage any longer (Urban and Vendemini 1992). Another way of creating a black box is integrating discrete activities into a systematic totality where each is relatively modest when seen in isolation (Lorange and Roos, 1992:111).

A careful partner selection, extensive efforts in trusting–building, and a sophisticated system of communication management help to create a common identity that permits knowledge application in good faith. A perspective has to be implemented in the system that allows the partners to share the holistic view of the NW, seeing the collective as a unit that can achieve competitive advantage (Hinterhuber and Levin 1994; Jarillo, 1993).

The success of the learning process depends on the efficient management of the knowledge flows. Formally, the broker has to seek to develop a system that facilitates and encourages the sharing of knowledge as well as the acceptance of foreign knowledge. Informally, he advises partners in techniques of advanced knowledge management and incites the development of techniques that are consistent throughout the NW (Hirsch 1997:69).

4) Conflict management: Crises are periods of unforeseen and unplanned dynamics in the system producing potentially dysfunctional effects (Nordhaus and Samuelson 1989). In NW analysis a living system is said to be almost permanently in crises due to the different developments of the system's elements and the changing environment, which continually produce internal and external shocks (Minor 1983). Conflicts are the roots of many crises. They occur as consequences of a change in motivation by the partners. Sydow (1992) argues that they are not only the condition and consequence of micro-political actions but also an inevitable outcome of existing interdependencies. Besides negative outcomes such as production disturbances, deterioration of internal relations may also produce functional effects. These negative outcomes may, for example, clarify the discrepancies of the NW member's interests. Notwithstanding, proper management of these outcomes will permit the development of compromise, and hence even the improvement of relations. Conflicts may occur due to the lack of compatibility of the member's structures and /or culture (Bronder 1992). The potential of friction increases as well with specialization of the partners which, may produce conflicts of communication and diverging interests. Further unequal distribution of power and complex decision making processes contribute to an exponential augmentation of the danger of conflict (Lawrence and Lorsch 1967).

Conflicts are a major source of transaction costs since they disturb general operation and force management to shift their attention to internal issues. It is in the interests of NW to produce an efficient procedure of conflict management to solve problems as smoothly as possible - hence to minimizing the occurring costs. In order to avoid the

¹² A further example of systemic innovation may be the development of a formula for a pharmaceutical product while the improvement of one element is autonomic. An innovation is thus said to be systemic if it concerns the production and /or business system as a whole.

frequent escalation of conflicts the broker utilizes conflict management measures. Proactive conflict management aims to attain a solution to problems at an early stage. NW members have to be managed in a way that enables them to detect a conflict and find a compromise by themselves. Simple guidelines such as the principle of reciprocity that obliges a partner to 'react' to the other's contribution may smoothen operations from the beginning (Bronder 1992).

According to Bronder (1992) many conflicts can be avoided by well-organized communication management, which has four major functions to fulfill: 1) **Governmental function** focuses on the distribution of orders and feedback in the NW. If the function is well developed it may facilitate the exchange of critical feedback and diminish the gap between members' perception and the actual interactive NW performance (Gumesson 1993); 2) **informational function** aims at reducing uncertainty by advancing operationally relevant data to the places where it is needed in the shortest possible time; 3) **socializing function** is supported to create a common identity of the NW members and 4) **coordinate function** serves to define each partner's responsibilities clearly and to create the framework cooperation (Lorange and Roos 1992).

When a conflict emerges the broker may choose between several alternative measures. Generally, compromises (that are elaborated with the disputants) promise the biggest chance of success (Mohr and Spekman 1994). The elaboration of general guidelines creating a framework for the negotiation of a solution has been considered a desirable action since it contributes to an objective approach to the problem (Bronder 1992; Kumar 1996; Lawrence and Lorsch 1967; Lorange and Roos 1992; Sydow 1992). Such guidelines may be constituted as the principle of bilateral research of the conflict's cause and solution (Bronder 1992), or viewed as the positive approach to conflict and crises by being an agent of change (Sydow 1992; Hirsch 1997:75). The broker may use the 'Laissez Faire' strategy to manage conflict by staying out of the conflict and delegating responsibility of the NW success to the disputing companies - indirectly involving them in the management process (Sydow 1992). Solutions found in such direct confrontation are generally more widely accepted than propositions imposed by third parties. According to Mohr and Spekman (1994) these solutions tend to increase members' satisfaction with the NW and show a greater promise of long-term success (Hirsch 1997:75).

The broker may use the 'arbitrational measure' to shorten dispute time; the arbitrational measure acts as a 'mediator' or 'referee' or external helper to conflict solution. He or she thereby produces beneficial outcomes due to integration of the parties in conflict (Anderson and Narus 1990). The broker has demonstrated his capacity and will to find compromises that consider each member's interest. The success will strengthen his position as 'father' and identity of the NW (Kanter 1994). In the case of highly complex and escalated conflicts, which can only be solved through the imposition of power, the broker may ask for the support of other, preferably objective, NW members (Bronder 1992). If conflict has reached a high level, that one party will be excluded from the NW. When this occurs the abstaining member or members have to be replaced immediately in order to avoid operational disturbances.

Destructive measures are the quickest way to end a conflict in the short time. In the long-term, however, these measures are seen as counterproductive and are likely to strain the fabric of the partnership (Mohr and Spekman 1994). The imposition of power hardly ever solves a conflict, but it can call the parties back into order. The

problem will most probably persist, resulting in higher overall dynamics in the NW that may also affect other relations. It can force the broker to supervise the relations and eventually intervene again (Bronder 1992; Mohr and Spekman 1994).

Sydow (1992) said that crisis management in NWs focuses mainly on internal malfunctions that threaten the NW's functionality. Such malfunctions could be underperformance in good or bad faith and unsatisfied disputants that are sabotaging the NW. Conflict with the broker in his function is basically regarded as an attack on the functionality of the NW (Miles and Snow 1992).

The underperformances of experienced crisis are different depending on fair play and foul play (or in legal terms good faith and bad faith) and therefore are treated differentially by the brokers. If a good will partner has under-performed his tasks such, as missed a deadline, or failed on one particular product or service, but has cooperated in limiting the damage, brokers generally pardon the delinquency under the condition that the partner makes up for his mistake. In case of continued failure the partner cannot count on the comprehension of the broker. Some brokers may determine that a structural problem exists and demand thorough examination of the processes and engage in scanning for possible replacements (Gummesson 1993). The Japanese brokers such as Mitsubishi and Toyota tend to encourage partners that are actually competing in the NW to help each other (Dyer and Ouchi 1993). The idea is that the stronger partner will share his secret with the weaker partner and help him to catch up. In the event that a partner under-performs in bad faith, i.e. a partner refuses to cooperate, the partner would be deemed unworthy of the trust that he had been offered (Hirsch 1997).

The broker has to make sure that the element to be excluded is the cause of the problems, the consequences of exclusion and a strategy for their solution (Burt and Minor 1983). A broker who tries to exclude a bottleneck in supply will cut himself off the lifeline and have greater difficulties with his decision of the exclusion (Burst 1992i). The broker should explain their decision clearly in order to create a framework of action in which their future actions can be judged and appreciated for their consistency (Gummesson 1993; Lundy and Cowling 1996). Not doing so may lead a broker to be perceived as arbitrary (by partners, especially) thereby decreasing their trustworthiness (Barney and Hansen 1994; Mohr and Spekman 1994; Hirsch 1997:84).

5) Social positioning: Burt (1992) emphasized that a favorable social position in terms of important links contributes to high influence of the actor. The brokers are postulated to spend much effort in sustaining their power and maximizing themselves and their partners socially in a way to avoid dysfunctional ruptures of the NW's activities, to prevent potential conflicts, and to assure sources available for learning in the NW. Burt (1983) further said that: "Social position is a continual adaptation of the NW's structure by modifying existing and potential links to improve the system's functioning or to stop dysfunctional developments." Most explications on control, in relatively loosely coupled systems, are based on a particular advantage of an actor that forces his partners to comply in their own interest (Brass and Burckhardt 1992; Burt 1992i and 1992ii). Research results prove that those systems are the most stable where the central company isolates its partners from each other (Jarillo 1993; Mohr and Spekman 1994; Quinn and Hilmer 1994). NW theory suggests two possibilities for a player who is inhibiting the contact, or allowing the contact while protecting their own position. First, they may vow to inhibit contact amongst the partners (Burt 1992i). Studies found that members of NWs will only seek the contact to members to whom

they are not directly connected if the benefits of the direct contact exceed the effort to be undertaken to establish the link (Minor 1983). Consequently, the broker who makes the bridging a highly difficult activity that needs special competencies will be the one to inhibit a direct contact (Burt 1983). Generally, the bridge is inhibited by the importance of the broker's contribution of a brand name, experience, technical competence etc. Second, the broker may secure his position in the NW while at the same time the bridging of relationships are allowed to flourish. In order for the broker to secure his position the broker has to develop strong ties with both parties or possess other strategic advantages that force the two parties to include the core company (Brass and Burckhardt 1990; Burt 1992i; 1992 ii). Strong ties may either be **social** (where the partners know and trust each other due to a long successful relation) or **formal** (where each party is obliged contractually to report back to the broker) (Urban and Vendemini 1992).

In a functioning relation, bridging should be an openly discussed measure. The bridging partner should know why they are being bypassed and be allowed to engage in protective measures. As a result, bridging and proactive actions are not contradictory with the basic conditions of trust and cooperation in the NW - since both are based on a bilateral situation of strength. An increased number of links in the NW promotes stability and improves the flow of information (Gomes-Casseres 1994; Knoke and Burt 1983). The broker has to carefully weigh the importance of the 'sub-suppliers' against the needed efforts to discover their identity and the potential damage to the NW. Another condition is sympathy - which depends on the sub-supplier's attitude towards the system. Ideally the sub-supplier feels like contributing to the entire system, and is thus interested in such a bridge (Jarillo 1993). If the degree of loyalty of the indirect partner with the 'bridged member' is high, all of the efforts are relatively useless since the sub-supplier could leave the NW with their direct partner (Jarillo 1993; Lorenzoni and Ornati 1988). This scenario poses problems to the broker and high risk to the NW as a whole. Even though the sub-suppliers have been recognized as highly important to the NW, the changes of tying them permanently to the system are relatively small. The broker faces the dilemma of either dissolving the valuable relation or continuing it whereby, they increase the NW's dependence (Sydow 1992). Social positioning is hence far from being a function under the full control of the broker. The broker has to observe the many constraints that limit their efforts. Their strategies will be a function of them. Critical NW members have to be identified and contacted, and their links have to be entertained carefully. The broker, as the central part of the NW, has to tie such actors to herself or himself to assure their loyalty and efficiency for the NW as a whole (Hirsch 1997:96). In general, as said by Sydow (1992) the broker organizes his NW by applying both market and hierarchical means of coordination. The choice of means of coordination depends on the position of the broker and on the degree of tightness of the coupling. If the NW is relatively tightly coupled the firms are highly interdependent (similar to integrated companies) and the broker can refer to hierarchical techniques while in a relatively loosely coupled system market type techniques are generally more efficient.

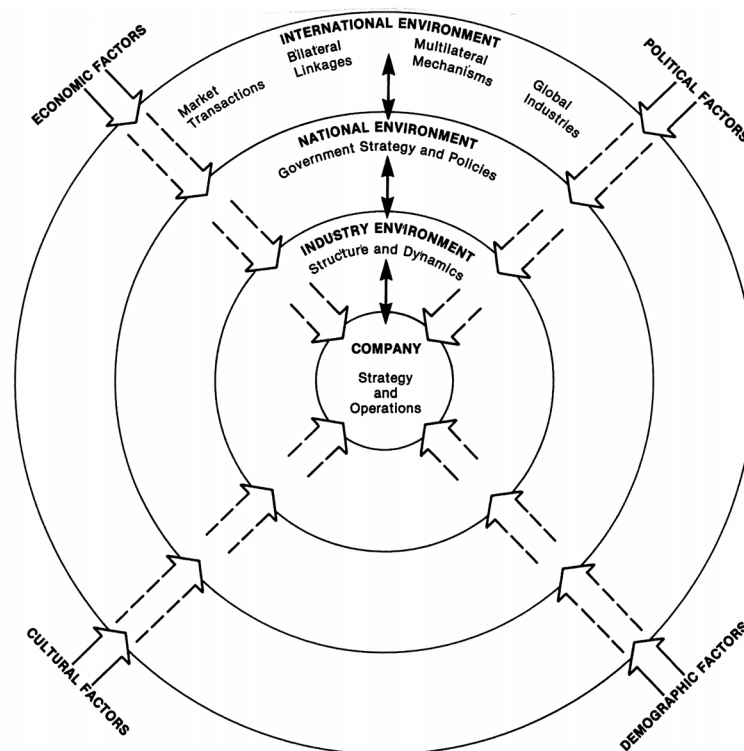
2.4.4 Environmental Aspects

This section presents literature concerning the external factors that can impact the enterprise's strategic conduct in forming NW alliances. Following a general theoretical explanation, a brief overview introducing China's transitional economic

process is presented as part of literature review in relation to the business environment of the research problems of this research.

The general environment that surrounds an organization can be thought to consist of the elements of physical structure, social structure, ecological structure, legal structure, cultural (including religious) structure, political structure, economic structure, psychological structure and international structure. All of these structures may affect, to different extents, the creation and survival of an organization. Organizations are social systems, and they are open systems dependent upon other social systems for their survival (Jackson and Morgan, 1978:230). According to Austin (1990) the fundamental task in environment analysis is to identify and understand the channels through which external forces impact the firm. One should take a broad view of the forces shaping the environment, systematically recognizing the connections and interdependencies. The framework sorts external factors into economic, political, cultural, and demographic categories. Then it envisions the business environment as having the international level encompassing various kinds of interactions among countries, the national level as shaped by a government's strategy and politics, the industrial level involving firm's immediate competitive environment, and the company level comprising the individual enterprise's strategy and operations. These environmental levels are envisioned as moving from the most macro (the firm itself) to the most micro (the internal level of the firm). Each of these levels is shaped by the overall economic, political, cultural, and demographic factors. Actors at each level can affect the other three levels, as they are interactive (Toral 2000:93). Figure 24 shows an environmental analysis framework provided by Austin (1990).

Figure 24: Environmental Analysis Framework



(Source: Based on Austin, J (1990). *Managing in Developing Countries: Strategic Analysis and Operating Techniques*. New York, Free Press in Toral 2000:91-92

An organization is a subsystem of one or more larger systems. Katz and Kahn (1966) suggest that two major sets of determinants in the initial stages of an organization are environmental pressures or a common environmental problem, and the characteristics and needs of the population. The environmental pressures generate task demands which are soon met by appropriate production or technical structures. This perspective pre-supposes that the environment is causal in organizational formation. Like technology and size, environment, for some analyses, is an imperative for organizations (Jackson and Morgan, 1978:230). Thompson and Lawrence and Lorsch (1967) emphasized environment's influence on the organization in relation to environment uncertainty. One of the generally accepted propositions about organizations, mentioned earlier, is that they seek to avoid uncertainty (Cyert and March, 1963). Terreberry (1968:595) argued that, as they evolve, organizations face an increasingly turbulent environment which will result in increased uncertainty for the organization. He further noted that as organizational environments evolve the change in the environment is characterized by a change in the important constituents of the environment. Conditions arise in which other formal organizations become important factors in the focal organization's field. The critical organizational responses involve complex operations requiring sequential choices based upon the calculated action of other organizations and counteractions. Hence, the concern for other organizations tends to grow and interorganizational relations take on more importance as an organization evolves. Hall (1972:153) noted that if organizations do become more complex because of pressures (internal or external) more joint programs and continued development of interorganizational relationships will emerge - even, perhaps, at an increasing rate (Jackson and Morgan, 1978:242, 243).

NWs, like any other incomplete social systems, are operating in their environment (which consist of other social subsystems such as customers, related industrial sectors, governmental agencies, local and international competitions, and other NWs) and their activities are constantly impacted by important environmental factors: for example, economic situation or political instability and so on. A principal tenet of organizational theory is that structure is related to environment (Aldrich and Marsden 1988). Organizations that fit their environments will perform better than those that do not (Emery and Trist 1965; Wholey and Brittain 1986). "NWs (or organic) structures are better suited to complex, rapidly changing, and turbulent environments than hierarchical (or mechanistic) structures, which do better in stable, simple, routine environments" (Burns and Stalker 1961; Mintzberg 1979; Miles and Snow 1986). For example, investment banks, like many types of professional service firms, use a NW design in part because professional services require frequent involvement with the environment-customers, competitors, and suppliers (Eccles and Crane 1987). While many organizations buffer their "technological core" from the environment (Thompson 1967), the organization and its environment are closely intermeshed in the production of professional services. As an incomplete social system, an organization must be designed to relate to its environment - suppliers, customers, regulators, competitors, and the like (Baker 1992).

The earlier organizational theorists Dill (1958), Evan (1966), and Warren (1967), proponents of NW perspectives, suggested that "most significant elements of an organization's environment are the other organizations with which it must transact." Nohria (1992) further emphasized: **"An organization's environment is properly seen as a network of other organizations."** The argument was that analysis of an organization's environment should not limit on the degree of uncertainty or resource

scarcity, but search for the sources of these pressures. According to Nohria, moreover, mere identification of those organizations is insufficient; it is equally important to know the pattern of relationships among them. Barley et al. (1992), from analyzing the pattern of strategic alliances among firms in the biotechnology industry, stated that it is insufficient and even probably erroneous to explain the strategic behavior of relationships in this industry without paying explicit attention to the NW of relationships among them.

According to Barley, Freeman, and Hybels (1992) resource dependency, power, and exchange have long been central to theories of organizations and their environments - arguing that all organizations rely on their environment for essential resources. However, organizations cannot exploit their environments directly because the resources that they need are usually controlled by other organizations. Consequently, organizations must engage in exchange with other organizations if they are to survive. An organization may turn to different organizations for financing, for personnel, for information, raw materials, or political support. In reality the extent to which organizations are constrained by exchange relations is likely to be far greater than resource-dependence theory implies. From a NW perspective, **“the environment consists of a field of relationships that bind organizations together.”** Also called an “interorganizational field” (DiMaggio and Powell 1983:148), key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products are falling into these categories these organizations. This conception of environment is similar with Michael Porter’s (1980) framework for analyzing industries - excepting the greater emphasis put on the NW perspective to the overall pattern of relationships among firms. Nohria (1992) summarized that a NW perspective on organization-environment relations pushes beyond abstract notions of environmental uncertainty, resource dependencies, and institutional pressures. It seeks to locate the precise source of these environmental forces by analyzing the pattern of relationships among the organizations that make up the environment.

Though the notion that the NW organization is more appropriate for conditions of uncertainty, ambiguity, and risk has achieved faddish popularity recently, it is actually not new. Burns and Stalker (1961) argued that in **unstable environments** the bureaucratic or “mechanistic” organizational form is ineffective. Instead, in such environments, an “organic” organization comprised of a complex network of ties that transcend whatever formal hierarchy exists and form and dissolve as necessary is much more effective.

As a relevant part of the literature concerning environmental aspects, the following section focuses on providing an overview of the China’s business environment.

2.4.4.1 Overview on China’s Business Environment

2.4.4.1.1 Macro Economic Development

China’s Economy Prior to Reforms

Prior to 1979, China maintained a centrally planned economy. A large share of the country’s economic output was directed and controlled by the state - which set production goals, controlled prices, and allocated resources throughout most of the economy. During the 1950s, all of China’s individual household farms were collectivized into large communes. To support rapid industrialization during the 1960s and 1970s, the central government undertook large-scale investments in physical and human capital. As a result, by 1978 nearly three-fourths of industrial

production was produced by centrally controlled SOEs -according to centrally planned output targets. Private enterprises and foreign invested firms were nearly non-existent. The central goal of the Chinese government was to make China's economy relatively self-sufficient. Foreign trade was generally limited to obtaining only those goods that could not be made or obtained in China.

China's actual GDP grew at an estimated average annual rate of about 5.3% from 1960-1978. However, government policies kept the Chinese economy relatively stagnant and inefficient. This was mainly because there were few profit incentives for firms and farmers, competition was virtually nonexistent, and price and production controls caused widespread distortions in the economy. Consequently, Chinese living standards were substantially lower than those of many other developing countries (Morrison, 2000).

The Introduction of Economic Reforms

Beginning in 1979, China launched several economic reforms. The central government initiated price and ownership incentives for farmers, enabling them to sell a portion of their crops on the free market. In addition, the government established four special economic zones for the purpose of attracting foreign investment, boosting exports, and importing high technology products into China. Additional reforms followed in stages that sought to decentralize economic policy making in several economic sectors, especially trade. Economic control of various enterprises was given to provincial and local governments, which were then generally allowed to operate and compete on free market principles, rather than under the direction and guidance of state planning. Additional coastal regions and cities were designated as open cities and development zones, allowing them to experiment with free market reforms and to offer tax and trade incentives to attract foreign investment. In addition, state price controls on a wide range of products were gradually eliminated (Morrison, 2000).

As a result of the introduction of economic reforms, China has become one of the world's fastest growing economies. During the period of the Ninth Five Year Plan (1996-2000) the average annual growth rate in GDP was 8.3% - exceeding the 8.0% targeted in the plan. As the country opened up to overseas business its foreign trade value has grown considerably. By 1998, the combined value of China's import and export trade was valued at \$323.9 billion. At this level it was the 11th highest in the world, compared with a ranking of 32nd ten years earlier. In November 2000 China's year to date foreign trade had reached \$430.9 billion. Similarly, increasing its overseas activities following the economic reform has enabled the country to build up its foreign reserves. China's 1978 foreign exchange reserve amounted to only \$167 million but this Figure had increased to \$154.7 billion by the end of 1999. National statistics show that by July 2000 overseas investors from more than 180 countries and regions had established more than 353,700 overseas-funded enterprises in China. Total foreign investment has exceeded \$327.7 billion. Domestic savings in that year reached \$720 billion, up from \$465 billion in 1996 (China State Statistical Bureau 2000). At the heart of the Chinese 'economic miracle' lies an industrialization strategy that has combined the introduction of market forces, gradual reduction of mandatory planning, decentralization, autonomy in economic management and opening the economy to international trade and foreign investment (Broadman 1995).

By the end of 1999 China reached a population of 1.259 billion (China statistical Bureau 2000). China has made a goal to keep the population below 1.4 billion until 2010 (the State Family Planning Commission *Peoples' Daily*, 11/03/2000). Following

economic change and growth many people abandoned their rural lifestyles in search of more lucrative work in the cities. The percentage of people in urban zones increased from 12.46% in 1952 to 30.89% in 1999 as shown in Table 4. Continuing urbanization and expansion of city consumerism is attracting more trade and higher levels of investment in the food, beverage, and service industries.

Table 4: Population Growth in China and its Increasing Urbanization, 1952-1999

Year	1952	1962	1970	1980	1990	1999
Total (million)	574.8	673.0	823.0	987.1	1143.3	1259.1
Urban %	12.46	17.33	17.38	19.39	26.41	30.89
Rural %	87.54	82.67	82.62	80.61	73.59	69.11

(Source: state Statistical Bureau. Note: data include military personnel, but exclude the population of Hong Kong, Macao and Taiwan.)

Table 5 demonstrates the estimate of the natural growth rate of the Chinese population from 2000, to 2050.

Table 5: Forecast Population Growth, 2000-2050

Year	Total (billion)	Natural growth rate (%)
2000	1.27	9.71
2010	1.38	7.71
2020	1.47	4.77
2030	1.52	2.41
2040	1.54	0.36
2050	1.53	-1.83

(Source: China State family Planning Commission)

In 1978, the central government introduced a strategic guiding policy for revitalizing the domestic economy and opening-up trade, industry, and commerce etc. to the outside world. Table 6 shows the selected macroeconomic indices from 1996 to 1999.

Table 6: Selected Macroeconomic Indices, 1996-1999

	1996	1997	1998	1999
GDP (billion Yuan)	6,788.5	7,446.3	7,834.5	8,205.4
Investment in fixed assets (billion Yuan)	2,297.4	2,494.1	2,845.8	2,987.6
Export (\$100 million)	1,510.5	1,827.9	1,837.1	1,949.3
Import (\$100 million)	1,338.3	1,423.7	1,4022.4	1,657.2
Net export (\$100 million)	122.2	404.2	434.8	292.1
Foreign direct investment (\$billion)	41.7	45.3	45.6	40.4
Foreign exchange reserve (\$ billion)	105.0	139.9	145.0	154.7
Domestic savings (billion Yuan)	3,852.1	4,628.0	5,340.8	5,962.2

(Source: China State Statistical Bureau)

Table 7 shows the World Bank's (1997) prediction that China's annual GDP growth rate of will average 6.9% over the coming 10 years, and 5.5% during 2011-2020.

Table 7: Annual Growth Rate of GDP, 1995-2010

	Actual growth %	Forecast growth %		
	1985-1995	1995-2000	2001-2010	1995-2010
GDP	9.8	8.4	6.9	5.5
Agriculture	4.2	3.1	4.2	3.7
Industry	13.1	9.2	6.6	5.4
Service	9.8	9.7	8.1	6.0

(Source: World Bank, 1997)

The direction of China's development for the next decade is being driven by three policies: the Tenth Five Year Plan (2001-2005), China's accession to the WTO, and the focus on the development of the country's western region which is currently

lagging behind the development of the eastern and coastal areas. China plans to maintain relatively rapid economic growth during the tenth Five Year Plan by achieving a goal of doubling the GDP in 2010 compared with that in 2000. In line with its continued market development, a standardized, national market system permitting fair competition for business is yet to be established. The government itself is to be further transformed in line with the needs of the market economy, the macro-restructuring process and management are to be strengthened and improved (www.china.org.cn, 2002).

China's Accession to the WTO and the Impacts to the Agricultural industry

Hoekman and Kostecki (1995) described the role of the WTO from two perspectives: "the first is to regard the institution as *a code of conduct*; the second is to view it as *a market*. Trade negotiations are conducted to reduce barriers to trade, agree to rules of behavior, and resolve disputes. They can be regarded as a market through which nations attempt to create and alter rules governing the trade policies of Members (the code of conduct), and engage in the reciprocal exchange of liberalization commitments. Two fundamental elements can be identified in this context: achieving an agreement, and enforcing it." Within this context, countries have incentives to cooperate while agreeing to not impose barriers. Therefore, this liberal trade behavior of nations within the WTO framework is a positive-sum game.

China was a founding member of the GATT but ceased to participate in the late 1940s. After more than a decade of negotiation, China has obtained WTO membership again in 2001. The reasons for this long drawn-out negotiation process, according to Hoekman and Kostecki (2001), were that, firstly, for many countries, China was a trade powerhouse of central planning economy, and they were willing to accept China in the multilateral trade system only if it could be shown that China's economy had become sufficiently market-based, with only limited government intervention. Those countries were of the view that "the accession should be used as an instrument to open the Chinese market to foreign competition, and as a mechanism for achieving substantial reforms to China's legal and policy regime. Much of the negotiations therefore involved not just market access, but efforts to increase transparency and ensure that a 'level playing field' prevailed on the Chinese market once goods had been imported. Given that China was pursuing reforms throughout the period of negotiations, the regulatory situation was a moving target, also a complicating matters." Second, China sought to be treated as a developing country and demanded long transitional periods and low tariffs. The third reason was non-economic considerations of linkage between trade and foreign policy stances of OECD countries, especially the United States (Hoekman and Kostecki, 2001:403, 404). As a result of the long negotiation process, the final draft protocol featured extensive liberalization pre-commitments, with many restrictions to be gradually phased out during 2001-2005 (EU, 2000). These commitments are tempered by a transitional period for the elimination of WTO inconsistent policies (Hoekman and Kostecki, 2001). Additionally, with respect to the right of imposing measures of contingent protection on the basis of criteria that do not conform to the WTO by the members, Hoekman and Kostecki (2001) were of the view that bringing China into the WTO would be a major achievement because the treatment of China - in relation to contingent protection - would signify the extent to which protectionist interests can be controlled in WTO member countries.

From China's perspective, before joining the WTO, high trade barriers were maintained by the government largely to protect domestic firms from foreign competition. Such policies, according to Morrison (2000), have two main negative effects: Firstly, they give domestic firms less incentive to improve their efficiency. Secondly, restricting competition raises prices and limits product choices for Chinese consumers. Obtaining WTO membership has significant implications for China's economic growth, domestic reforms, and integration into the global economy. However, the WTO accession brings to China not only benefits but challenges as well. According to Asian Development Bank (2000), the economic benefits for China from joining the WTO are:

- Cutting tariffs, liberalizing trade and investment and opening up domestic sectors for foreign participation lead to significant efficiency gains for China's economy
- WTO membership improves China's export prospects
- China's share of the textile market is kept at 17 percent under the Multi- Fiber Agreement
- More than half of China's exports to the United States and about half of its exports to the European Union face non-tariff barriers; WTO membership eliminates these restrictions and improves China's export prospects
- For Chinese consumers, membership to the WTO will mean greater freedom to choose from an increased availability of higher quality goods and services at competitive prices
- Consumer choices will expand for a wide variety of goods and services, ranging from wheat, fruits, and automobiles as well as banking, insurance, telecommunications, and Internet services

Membership in the WTO also poses challenges with regard to China's **agriculture, automobiles, banking, insurance and telecommunications** industries:

- Many agricultural products in China are affected. Domestic prices of some commodities are higher than international prices because of farm price support policies. Cutting import tariffs and liberalizing trade replaces some domestic agricultural production and, as a negative consequence, reduces incomes for farmers producing these commodities
- The Chinese automobile sector has developed behind high tariff walls and import restrictions. Lowering tariffs and opening the sector to foreign competition puts domestic producers under competitive pressures. China's 120 vehicle producers are fragmented and inefficient. Under the WTO, tariffs on imported cars fall from 80- 100 percent to 25 percent; foreign carmakers are allowed to supply financing to local automobile buyers - forcing domestic carmakers to bring their costs down and to improve efficiency
- The financial position of the Chinese banking system is weak. Foreign competition will require domestic banks to improve efficiency and products offered. Addressing non-performing loans while re-capitalizing the banks will take time. A key challenge will be to strengthen the banks by implementing international prudential norms and risk management practices so that banks are able to adjust to international competition. Some domestic banks will form strategic partnerships with foreign banks to meet the post-WTO challenges
- China's insurance sector is financially weak; most life insurance companies have payout obligations that are greater than their current return on investments. Shortages of actuaries and professional insurance management staff have contributed to poor business practices by insurance companies. The quality of

service and business skills of the Chinese insurance sector are not comparable to those of international companies. Domestic insurance companies will need to adopt international business and prudential practices so that they can adjust to the international competition that will follow China's entry into the WTO

- The Government owned China Telecoms has controlled most of the business-including fixed-line telephone services, cellular telephones, and Internet services. The costs of telecommunication in China are high and the quality of many of the services is poor. While telecommunications competition will improve service quality and reduce costs, there will be adjustment pressures on domestic telecommunications companies (European Representative Office, Asian Development Bank, 2000).

Since **agriculture** is directly concerned with the research industry targeted by this study, the rest of this section will focus on some major impacts of the WTO accession to the China's agricultural industry.

Out of all WTO commitments, the agricultural component is the most contentious because of the number of people employed in agriculture - as well as its implications for food security and social stability (Feng, 2001). According to Wang (2002), the most important change in agriculture following China's WTO accession is that China has to adopt a tariff quota for total grain imports at a 1 per cent token tariff rate. Table 8 shows the tariff quota for grains from 2002 to 2004. According to the accession agreement, the quota is to be shared between the state and private trading enterprises, and all unused state quotas are to be transferred to private enterprises.

Table 8: Tariff Quota for Grain, 2002-2004 (Million tones)

	2002	2003	2004
Wheat	8.468	9.052	9.636
Corn	5.850	6.515	7.200
Rice	3.990	4.655	5.320
Total	18.308	20.232	22.156

Source: World Trade Organization, 2001. Accession of the people's Republic of China, decision of 10 November 2001', cited from www.moftec.gov.cn/. In X.L Wang (2002): "The WTO Challenge to Agriculture" "China 2002: WTO Entry and a World Recession." Asian Pacific Press 2002

According to Cheng (2002) local wheat, soybean, corn and cotton are less competitive than imported counterparts in terms of quality, cost and output. Therefore, China's tariff-rate quota system commitment for these key products is probably more important than the reduction in the average statutory tariff on agricultural imports (Nicholas 2002).

Wang (2002) considered that the major problem of the impact of the tariff quota is the unbalanced distribution of losses and gains. These costs directly affect low-income farmers, resulting in a relatively large decline in the average percentage of their income. These benefits mainly go to urban consumers who have a much higher income, therefore accounting for only a small proportion of their income. Additionally, as a result of the rigid adjustment, job losses will exert pressure on the economy as well.

Meanwhile, Feng (2001) suggested some major positive impacts in the agriculture sector. According to him, WTO accession may help complete the unfinished agenda of institutional transformation in agricultural and rural sectors through the dynamics of the interaction between the market oriented reforms and the further opening up to the outside world. The implementation of WTO commitments is likely to reduce

government intervention in the distribution of agricultural products, and break up the state monopoly in foreign trade in bulk agricultural products. Improvement in the institutional framework will make important contributions to the long-term growth in Chinese agricultural, and especially rural, income. WTO accession and agricultural liberation may also have significant implications for food security in China. Tariff quota arrangement for the three major grain products are likely to increase China's grain imports, indicating a gradual integration of the Chinese food economy into the world food market. As the evolving pattern of "food for food" exchange may further develop in the future, traditional mechanisms for achieving food security - based on the central concept of grain self-sufficiency - have to be modified. From time to time, China needs to assess how to best assure its food security in the future as domestic and external environments change. The policy implication here is that, the government needs to minimize excessive administrative intervention in the agricultural sector that has often been proposed and implemented on the basis of the food security argument. In addition, WTO accession is likely to help China further expand exports of the products in which China assumes comparative advantages - such as vegetables and fruits. It may also bring about cost adjustment for those products for which the domestic production costs are relatively high - potentially causing imports of such things as grain and oil-bearing products.

According to the Ministry of Agriculture (MOA), the country is now eyeing the export of vegetables, fruits, and animal products that have long been regarded as supplements to the staple farm produce. A series of programs are being carried out to boost the production of animal products, fish, flowers, and processed farm produce. Emphasis is to be put on the quality of this produce - such as control of pesticide residue and the quarantine system for farm produce. China exported about 1.8 million tons of fruit in 2000, less than 2 percent of its total output. The program of pollution-free foods will be expanded this year from four pilot cities to a number of provincial capital cities. The ministry also encourages trade organizations in the agriculture industry to protect farmers' interests in the world market (People's Daily, 2002).

Nicholas (2002) also explained that China's leadership used the WTO agreement to accelerate the pace of agricultural change. They recognize that China's best prospect for sustaining the growth of farm incomes is not through ever-growing subsidies with inefficient production, but rather through letting market incentives push farmers into growing less land-intensive agricultural crops. Since the leadership believes that more market-driven pricing offers the best long-term prospects for efficiency of resource use and rising income. Similarly, since its WTO entry China's willingness to eliminate agricultural export subsidies signals an important commitment to allow market mechanisms to work relatively unfettered in the domestic agricultural market. Terminating these subsidies also eliminates an important distortion of world trade in farm products (Nicholas, 2002:175).

To resume what Hoekman and Kostecki (1995) had explained - within the WTO framework, trade negotiations are conducted to reduce barriers to trade, agree to rules of behavior, and resolve disputes. This general implication about following the WTO rules was referred to by the former WTO Director-General M. Moore in his remark that what China lacks most after WTO entry are not funds, technology and talented people, but the whole society's awareness of rules. Accordingly, China's MOFTEC Minister Shi Guangsheng, emphasized three things: 1) participating in WTO multilateral trade negotiations and in the formulation of multilateral trade rules, 2) the study of WTO rules and learning to use these rules to manage the Chinese economy

and protect its own interests, and 3) to provide training of WTO knowledge to professionals, government functionaries and entrepreneurs.

In conclusion, since China's accession to the WTO, the central government has adopted effective macro-control measures, continued to pursue a pro-active fiscal policy and a stable monetary policy and has further reformed the foreign-related economic management system in line with WTO rules. As a result, China's national economy has maintained a steady rate of high growth - showing that the overall influence exerted by joining the WTO on China's economy is positive (People's Daily, 2002). This was also reflected from the foreign investors' point of view, as DeWoskin (2002) concluded that, overall, an objective assessment of the present situation (since China's WTO accession) leads one to be optimistic about the next three to five years. Looking at a balanced score card of those areas of change considered most important among foreign investors, one sees difficulties, but also clear progress. "Against a history of unstable and non-commercial behavior, business practices throughout the economy are moving steadily toward international norms. State-ownership of competitive enterprises is inherently problematic in achieving national treatment and a level playing field for foreign investors, but China's commitment since 1994 to "separating regulation from business" has had a major impact there. Foreign investment restrictions, which have been *ad hoc*, non-transparent, and subject to different interpretations in different jurisdictions, are moving toward clarity, stability, and uniform application. Finally, the reliable and competent enforcement of China's own laws and regulations, long a concern of foreign investors, is being addressed with education and structural changes in the judiciary at the highest levels" (DeWoskin, 2002).

The drive to promote western China will be a national priority for several decades to come. Among many new policies and projects are extra government spending, stronger policy support, and lower tax rates. These measures will be upheld for 10 years. China plans to spend 100 billion Yuan each year on improving its economy and restructuring its market in the West. This will be in the form of special bonds, bank loans, and other investments. Income tax is to be cut from the standard 33% to 15%. Domestic and foreign firms and private and state firms will receive the same treatment. Because of their vastly different geographical and social conditions the western part of China obviously faces a huge challenge if it wishes to experience the same degree of success in restructuring and modernizing as the coastal regions.

2.4.4.1.2 The Economic Reform Process

China's reform begins with agricultural reform, since the agricultural reform lays the foundation of the economic system reforms (Ma, 1999). The Chinese central government adopted a three-stage strategy for reforming the nation's economy in 1987 (China in Brief, www.china.org.cn, 2002). These stages were:

- 1 Doubling 1980's GDP and to end food and clothing shortages - achieved by 1988
- 2 Quadrupling 1980's GDP by the end of the century - achieved in 1990, enabling the government to put forward new objectives. These included quadrupling the per capita GDP of 1980 by 2000 (by 2000, the population was expected to have increased by 300 million)

- 3 To fully modernize the economy by the middle of the 21st century. The per capita GDP is targeted to reach the level of middle-income countries. It is intended to double GDP between 2000 and 2010

In 1992, the goal of China's economic reform was to establish a market economy system. Its principle components included the adoption of a series of macro-adjustment and control measures to carry out all round, and in-depth reform, with public ownership continuing to be the main form of ownership while different types of ownership were developed. The operations of SOEs have been further transformed to meet the requirements of the market economy; the functions of the government were separated from those enterprises - establishing an open and unified national market system by integrating urban and rural market, providing for reciprocal flows between domestic and international markets, and promoting the optimization of resource allocation. They also set out to establish a new income distribution system and set up a multi-tier social security system to accelerate the development of economy.

By 1999 the reform had included the areas of the institutional restructuring of the State Council, SOEs, the banking system, the housing and medical insurance systems, and the grain circulation system. At this time, plans for reform of the investment, banking, financial and taxation systems were being formulated as well (China in Brief www.china.org.cn, 2002).

2.4.4.1.3 Development of Diversified Ownership Economy

One of the important outcomes of market-oriented reforms in China over the past 20 years or so is the emergence of a significant private sector. It now accounts for about one third of the gross domestic product and is officially recognized as an important component of the economy. According to the State Statistical Bureau, Chinese industrial enterprises are divided into four categories:

- 1 SOEs – including enterprises with controls share held by the state
- 2 Collectively-owned enterprises – including urban collectives, township enterprises, village enterprises and cooperatives
- 3 Individually-owned enterprises – those private enterprises owned by no more than seven people
- 4 Enterprises of other types of ownership – including privately-owned enterprises (owned by eight or more persons), share-holding corporations and enterprises funded by foreigners or by entrepreneurs from Hong Kong, Macao or Taiwan.

Table 9 shows the gross industrial output value and percentage by various ownership types from 1978 to 1999. Between 1978 and 1999 the individual-owned enterprises and enterprises of other types of ownership developed very quickly. Although the total output of SOEs has declined sharply, the dominant role of public-ownership enterprise still remains. The combined SOEs and collective-owned enterprises accounted for about two thirds of the Chinese industrial economy in 1999.

Table 9: Gross Industrial Output and Percentage by Ownership, 1978-1999

% Share of industrial output for enterprise types					
Year	Gross industrial output (100million Yuan)	SOE*	Collective-owned	Individual-owned	Other
1978	4,237	77.6	22.4	-	-
1980	5,154	76.0	23.5	0.0	0.5
1990	23,924	54.6	35.6	5.4	4.4
1995	91,894	34.0	36.6	12.9	16.6
1999	126,111	28.2	35.4	18.2	26.1

(Source: China Statistical Yearbook, 2000. Note: * Including enterprises with controlling share owned by the state. Data in the table cover the non-state-owned industrial enterprises with an annual sales income of less than 5 million Yuan.)

Table 10 indicates that by the end of 1999 the number of registered enterprises in the non-public-ownership sector (individual-owned and other types) amounted to 6.22 million, with a combined total of 13.43 million employees (China State Statistical Bureau, 2000). National statistics show that by July 2000 overseas investors from more than 180 countries and regions had established more than 353,700 overseas-funded enterprises in China. Total foreign investment has exceeded \$327.7 billion.

Table 10: Number of Industrial Enterprises by Ownership (thousand units), 1995-1999

Item	1995	1996	1997	1998	1999
Number of industrial enterprises	7,341.5	7,986.5	7,922.9	7,974.6	7,929.9
State-owned enterprises (including enterprises with controlling share held by the state)	118.0	127.6	110.0	64.7	61.3
Collective-owned enterprises	1,475	1,591.8	1,772.3	1,797.8	1,659.2
Individual –owned enterprises	5,688.2	6,210.7	5,974.7	6,033.8	6,126.8
Other types of ownership	60.3	70.2	77.3	85.7	91.8
Share-holding corporations	5.9	8.3	13.1	11.4	14.2
Enterprises funded by foreigners or by enterprises from Hong Kong, Macao and Taiwan	54.0	44.3	43.8	62.5	62.3

(Source: China Statistical Yearbook 2000. Note: May not add up to totals due to rounding)

2.4.4.1.4 Deregulation

China has modified many regulations and opened more fields to foreign investment. In February 2001, the National people's Congress passed a bill. In the amendments certain restrictions and regulations imposed on foreign investors (in both wholly owned and jointly owned ventures) were removed. These included regulations on the foreign exchange balance, the requirement of local purchasing of raw materials, fuel, and fittings, and export of the manufactured products. Companies no longer need to report their production and strategic plans to government departments. Because of the equal treatment of enterprises, competition increases for the domestic companies. In order to meet the requirement of WTO, China will continue to deregulate its economy, reduce barriers to international trade, and remove restrictions on foreign investment - creating a freer business environment for enterprises (Zhongqiu 2000:50).

2.4.4.1.5 Intellectual Property Protection

China enacted a patent law in 1984 and revised it in 1992; a copyright law was enacted in 1990 and became effective in 1991. Subsequently, China has acceded to the Bern, Geneva and Universal Copyright Conventions and implemented regulations in line with international norms for the protection of artistic and literary works, computer software, and phonograms. The current trademark statute was enacted in 1982, revised in 1992 and 1993. China is a member of the World Intellectual Property

Organization (WIPO) and signatories of the Paris and Vienna Conventions governing trademarks. As a result, the basic principles of China's trademark law are in conformity with international practice.

The Patent Law was amended in September 1992, enabling patents to be granted to all types of technological inventions. The level of protection afforded through patent rights was strengthened and the period of protection for an invention extended from 15 to 20 years from the date of application. In addition, at this time, the law allowed a review of patent rejections and other administrative provisions. It also permitted priority applications to be filed on a reciprocal basis with other countries, bringing the law further into line with Trade Related Aspects of Intellectual Property (TRIPs). As a signatory nation to the Paris Convention, in 1985 China began to receive foreign patent applications and to file its own applications abroad. At the start of 1994 China also signed up the Patent Cooperation Treaty (PCT). Another amended patent law, which went into effect in July 2001, essentially brought China's legislation in line with the requirements of WTO and TRIPs. According to the latest patent law, state-owned and private enterprises are treated equally in terms of patent application and authorization (www.china.org.cn, 2002).

2.4.4.1.6 Key Challenges

In the last 20 years, although China has made enormous progress in the areas of economic development and environmental protection, the efficiency of the remaining SOEs, the problems of economic restructuring, and population control remain to be the challenges. The World Bank predicts an average 6.6% annual growth in GDP over the first 20 years of this century, by which time the China State Family Planning Commission believes the population will have reached 1.47 billion. To achieve this growth, and also meet the needs of the work-age population, the pressure for employment will grow. However, job creation heavily relies on industrial expansion and this inevitably raises environmental pollution. By 2020 the unemployment rate is estimated to reach 10% and the sulphur dioxide and smoke dust released into the atmosphere will be 6%-7% higher than present levels. China's industrial sector - not only SOEs but also non-state enterprises - is the major generator of massive water and air pollution in the country (Broadman, 1995). One way of reducing environmental stress is to ensure that the output of contaminants is not concentrated in a single region. By developing high-tech industries and the expensive service sector in the western part of the country, and by continuing to invest in projects for improving environment protection, China will create more business and employment opportunities, while limiting the increase in pollutant levels in the eastern and coastal areas.

In tandem with the key challenges presented so far, corruption is a big problem as China undergoes its transformation from a planned to a market economy (Procuratorial Daily, 2003). Both corruption, and popular consciousness of it, have greatly increased since China began to institute market reforms (Johnston and Hao, 1995). According to Zheng and Fan (2002), the country has witnessed two major waves of corruption. First, in the late 1970s, as a dual pricing system was enforced for production materials. Some businessmen bribed officials to get access to the lower-priced commodities and then sold the goods at higher prices. A new wave of corruption came in the 1990s when the country's capital market and SOE reforms were at their initial development stage, with incomplete rules and regulations. Some

Governmental officials took bribes in exchange for granting low-interest rate loans to the bribers. Some of them even used public funds to invest privately in real estate, stocks or futures markets. Some SOE managers embezzled State assets through undervaluing or transferring the State property into their personal accounts during the restructuring process (China Daily 2002). Some managers indulged in speculation, buying materials or products at low planned prices and reselling them on the markets. They have increased their own bonuses and spent public funds for extravagant housing and banquets. Some have engaged in trading import permits, business licenses, currency on the black market, or even value-added tax (VAT) invoices (FBIS, 1995:20).

Consequently, the lack of rule of law in China limits competition and undermines the efficient allocation of resources in the economy. Corruption poses a problem for China's banking system because loans are often made on the basis of political connections. In many cases bank branches extend loans to firms controlled by local officials - even during periods when the central government has attempted to limit credit. Such a system promotes widespread inefficiency in the economy because savings are generally not allocated on the basis of obtaining the highest possible returns (Morrison 2000). "Corruption hurts economic activity, among other ways, by distorting the allocations of resources through such practices as nepotism, favoritism in the awarding of contracts and the failure to enforce contracts and property rights. Were corrupt practices to worsen, China's annual growth rate could diminish by about 0.5%" (Wolf, 2003).

Facing the threat to the country's social and political stability and economic development, the Chinese government has made great efforts in fighting against the corruption. From 1989 to May 2002 alone, some 610,000 corruption-related cases were investigated in which 30 ministerial-level officials were convicted with corruption and neoplasm practices. While punishing corruption offenders, the Chinese government is also strengthening its economic system to prevent corruption. In recent years (as reform is spearheaded in such areas as administrative approval, finance, and personnel systems) a large number of rules and regulations have been enacted and enforced to restrain the illegal actions of government officials. The Central Committee of the CPC from 1993 to 2000 alone issued about 20 directives and regulations relating to Party discipline. Institutional reform and tightened management supervision, aimed at preventing the abuse of power from the outset, have proven to be an effective way of fighting corruption (Zheng and Fan, 2002). Other enforcement of institutional control measures include a ban on business activities of the government institutions, the army and the police force (Procuratorial Daily, 2003); the requirement that officials make their individual property holdings public; the regulation on making officials accountable for wrongdoings; and the audit system for government officials etc (Zheng and Fan, 2002).

Johnston and Hao (1995) argued that the growth of markets alone is not sufficient to account for these problems; China's corruption problems are in significant part a consequence of the pre-reform system. They probed the nature and origins of China's corruption and the functions of a civil society and concluded that political reform is of as much importance as an anti-corruption strategy (Johnston and Hao, 1995:1).

Despite some results achieved in the China's anti corruption campaign (from programs characterized by institutional controlling) as economic reform continues to develop, fighting against corruption remains to be a major challenging task for the Government. Moreover, the topic of corruption is a complex one. In this section, the

subject is only introduced generally, but is essentially emphasized as a key challenge for China's present and future economic development.

2.4.4.1.7. State Owned Enterprises (SOEs) Reform

According to the conclusion of a World Bank report (World Bank News Release No. 98/1425), China can only solve the core of its SOE problems by fundamentally reorienting internal and external enterprise incentives toward market principles.

Until the enterprise reform began, functionally, SOEs carried out not only productive operations, but also were burdened with the roles of having to provide social services such as: housing, education, hospitals, social security (pensions and unemployment, accident and health insurance), food services and fuel and retail outlets (Broadman 1995).

SOE managers were neither rewarded for nor empowered to engage in value creation. SOE managers were governed by the dictates of a central plan created by bureaucrats and political leaders. Managers were informed of output quotas and other outcomes expected to be generated by their organization. The managers had very little influence over either the choice of inputs and outputs, output targets, prices set forth in the plan, or the parameters used in the design of the plan. Managers also had little influence over investment decisions that would determine their relative success at meeting plan targets. Because managers operated within a noncompetitive market under soft budget constraints, these institutional rigidities and inefficiencies did not pose a serious threat to enterprise survival. Further, managers' performance was assessed mainly by political factors, so the existing environment did not impede their attainment of personal success either (Satya, 2000).

The China's SOE reform in the 1980s and early 1990s focused mainly on **decentralization**. This included increasing the autonomy of and reducing government interventions in SOEs by allowing enterprise managers to make more decisions with respect to production, pricing, marketing, investment - and, to some extent, even employment. Production plans, price controls, and government distribution of inputs and outputs were abandoned. Previous requirements for SOEs to surrender a proportion of their turnover was abolished; replaced, instead, by value-added tax and profit tax systems. Bank loans replaced direct governmental finance of SOEs. There were also partial changes to the incentive system in enterprises with the Enterprise Contract System to SOEs. It was expected that these strategies would enable SOEs to survive growing market competition and be able to develop themselves. This strategy, however, was not very successful until the late 1990s. Initially, the financial situation of SOEs worsened. Non-performing loans built up rapidly. Statistical data shows that SOEs' share in gross industrial output dropped from 76 percent in 1980 to only 28 percent in 1999 - as shown in Table 11.

Table 11: Share of SOEs and Other Enterprises in Gross Industrial Output (percent)

	SOE	Collective	Self-employed	Others, including private	Total
1980	76.0	23.5	-	0.5	100.0
1985	64.9	32.1	1.9	1.2	100.0
1990	54.6	35.6	5.4	4.4	100.0
1995	34.0	36.6	12.9	16.6	100.0
1999	28.2	35.4	18.2	18.2	100.0

Note: including the shareholding corporations with controlling shares owned by the state.

Source: calculated by Wang (2002) from National Bureau of Statistics (NBS), 1994, 2000, and 2001. China Statistical Yearbook, China Statistics Press, Beijing. Wang (2002) "State-owned enterprise reform in China: has it been effective?" In China 2002: WTO entry and a world recession. Asia Pacific Press 2002.

While SOE shares in total output dropped rapidly, their shares in input (labor and investment) fell slowly, remaining quite high through the 1980s and early 1990s. The SOE share of urban employment was 76 percent in 1980 - it was still 59 percent in 1995. The reduction of the SOE share in total investment in fixed assets was also low. It only fell from 66 percent in 1985 to 54 percent in 1995 (see Table 12 and 13).

Table 12: Share of SOEs and Other Enterprises in Urban Employment (percent)

	SOE	Collective	Self-employed	Others, including private	Total
1980	76.2	23.0	0.8	-	100.0
1985	70.2	26.0	3.5	0.3	100.0
1990	70.2	24.1	4.2	1.5	100.0
1995	59.0	16.5	8.2	16.4	100.0
2000	38.1	7.0	10.2	44.8	100.0

Source: calculated by Wang (2002) from National Bureau of Statistics (NBS), 1994, 2000, and 2001. China Statistical Yearbook, China Statistics Press, Beijing. Wang (2002) 'State-Owned Enterprise Reform in China: Has it Been Effective?' In China 2002: WTO Entry and a World Recession. Asia Pacific Press 2002.

The allocation of loans has been biased towards SOEs throughout the reform period. SOEs have been characterized by high inputs and low rates of return, reflecting ineffective resource use (Wang 2002).

Table 13: Share of SOEs and Other Enterprises in Total Investment (percent)

	SOE	Collective	Self-employed	Others, including private	Total
1985	66.1	12.9	21.0	-	100.0
1990	65.6	11.9	22.5	-	100.0
1995	54.4	16.9	12.8	16.3	100.0
2000	50.1	14.9	14.3	21.0	100.0

Source: calculated by Wang (2002) from National Bureau of Statistics (NBS), 1994, 2000, and 2001. China Statistical Yearbook, China Statistics Press, Beijing. Wang (2002) 'State-Owned Enterprise Reform in China: Has it Been Effective?' In China 2002: WTO Entry and a World Recession. Asia Pacific Press 2002.

In the mid and late 1990s, SOE reform changed direction, particularly after 1998, when a large number of workers were made redundant. Significant change occurred to **ownership structure**. Restrictions on privatization were lifted for small SOEs. Since then many small SOEs have been privatized or rented to private managers. The recent fall in SOE's share in the economy was in part a result of this privatization. Shareholding systems were introduced to large number of medium and large SOEs, although the state held and still holds a controlling proportion of shares in many of them. With foreign investment some SOEs have been converted to JVs.

According to an enterprise survey carried out in 19 provinces, by the end of 1999 75 percent of the small and medium SOEs had been subject to fundamental change, including ownership changes. Another survey indicates that, of the 520 large SOEs that the survey covered, 70 percent had been transformed to corporations with a multi-owner system by the end of 1999 (Lu 2001).

According to the statistics, by the end of 2000 pure SOEs only contributed 49.7 percent of SOEs' gross industrial output. This implies that half of the SOEs have already become either share-holding companies or JVs with mixed state and private shareholder ownership (although the state still holds a controlling share). The state also tightened the monitoring system on large SOEs by appointing special auditors to these firms. These measures were observed to have improved the resource allocation in SOEs.

SOE employment, which has long included a high proportion of supernumeraries, decreased from 113 million to 81 million during the period between 1995-2000. SOEs' share in urban employment fell from 59 percent to 38 percent over the same period. Their share in total investment fell from 54 percent to 50 percent, as shown in Table 12 and 13.

Despite the growing importance of non state-owned enterprises in labor-intensive industries (such as light industry, construction, road transportation, retail, catering, and daily services) SOEs still play a dominant role in various heavy industries such as oil, power generation, metal smelting and chemical materials. They also dominate in other service sectors such as finance, rail and air transport, telecommunications, and medical services. Therefore, the performance of SOEs still has important impact on China's overall economic performance (Wang 2002).

The trend changed during the period 1998-2000, when SOEs profits in the industrial sector increased from 53 billion to 241 billion Yuan. Total profits in non-state industrial enterprises also increased dramatically, from 93 to 199 billion. By deducting the positive and negative effects of external factors, such as interest rate reduction between 1998 and 2000, (which indicates a profit increase of approximately 52 billion Yuan for SOEs); profit in the oil extraction industry in 1998-2000 (which was 14 and 115 billion Yuan, respectively) and write-off of 148.7 billion Yuan of non-performing loans in SOEs (Li 2001) - 47 billion Yuan was attributed to the higher profitability caused by internal factors in SOEs, resulting in an 89 percent increase in real profit from 53 to 99 billion Yuan between 1998 and 2000. The increase was from 0.7 per cent to 1.2 per cent for SOEs during the 1998-2000 period. This calculation suggested an improvement in the performance of SOEs - thus implying that SOE reforms since 1998 have been effective (Wang, 2002). The SOEs profitability improvement was believed by the author to be the result of recent reforms relating to changes in their ownership structure. In many industries, SOEs compete with non state-owned enterprises, thus inducing greater efficiency into the SOE sector.

The latest development of the SOEs reform includes the debt-to-equity swap, sale of smaller SOEs to private companies. The new regulations signal the government's approval of the sale of State-held share in more than 1,000 publicly listed companies. China's four large State-owned asset management companies are already allowed to sell part of the large pool of assets they gather from the four largest State-owned banks, which is considered by the central government as a major step forward for the landmark release of new regulations. As China's financial sectors grow increasingly more open, analysts say more foreign investors are likely to prefer stake transfers over direct investment in order to maximize their investments. Foreign multinationals are allowed to acquire SOEs and to take a controlling stake in the new companies - a breakthrough legal framework that will strategically shift the stakes of the country's tens of thousands of insolvent SOEs to foreign companies. A research report with Guotai J&A Securities claims that foreign companies would be mostly interested in sectors, such as manufacturing and the service sectors, in which China holds a competitive advantage and which have growth potential. The money from the stake sales will be used to fund the country's social security system, which is eventually expected to support millions of retired SOE employees (People's Daily June 4, 2002). In 2002, the government concentrated mainly on: first, **improving corporate governance**; second, **developing diverse forms of ownership** (while keeping the

public ownership in a dominant position) and finally, **reforming the investment and fund-raising systems** (Xinhua News Agency March 5, 2002).

SOE problems were characterized by low efficiencies caused by excessive government control and intervention (including investment behavior of government); lack of incentive to win market share; the government's failure to monitor of enterprise management, burden of redundant employment and more importantly, the sole state ownership structure. Wang (2000), summarized these problems into three major issues: **the need to establish a better supervision system** for correctly assessing the performance of SOE management and, accordingly, implementing incentive and punishment; and **the need for correcting the behavior of the owners of SOEs**. Within an environment of market competition, SOEs can be revitalized if these needs are met. Furthermore, concerning the ownership structure, **the need is to replace the sole state ownership of SOEs** by mainly a mixed multiple ownership structure. This has converted more SOEs to shareholding companies, JVs, cooperative and private firms.

Change in China, at present, is driven by many factors. "There is continuing pressure for domestic reform, pressure for cleaning the party and SOEs of corruption, pressure to develop China's interior and distribute wealth more evenly between urban and rural populations and between the eastern seaboard and remainder of the country. Population continues to grow, and environmental problems add to the stress. Technology is changing every aspect of commerce, communication, and public discourse. It is very difficult to find an example from China's history, or from anyone's history, of change at this pace and on this scale. As a result, there are **uncertainties** as to how things will move forward, and there are risks" (DeWoskin, 2002).

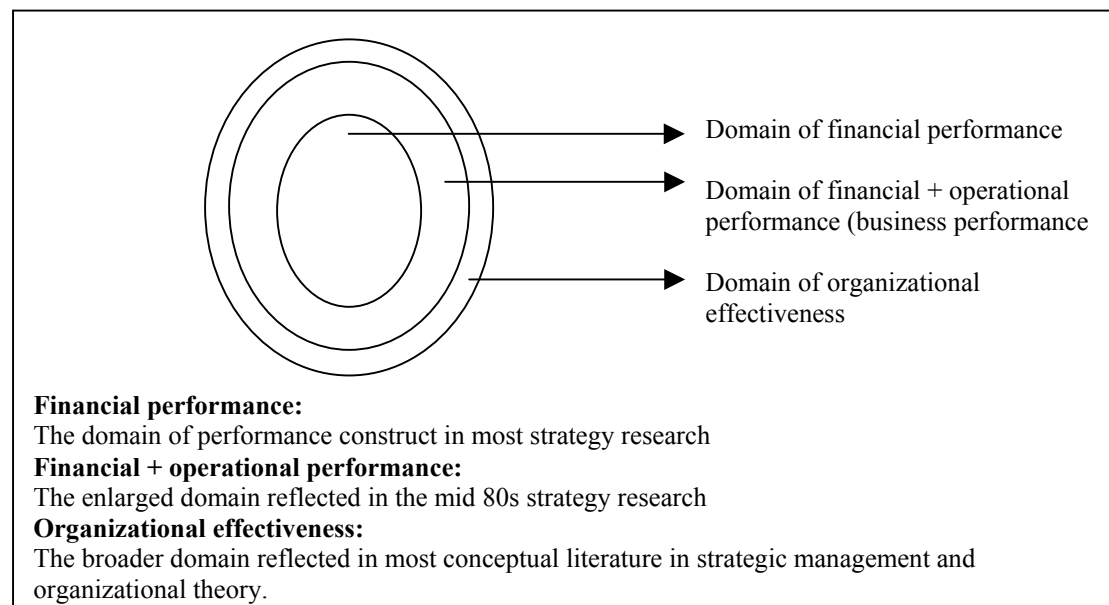
The variable "environment," is of particular importance in this dissertation because of its impacts to the firms' behavior in relation to their forming NW alliances. This section has firstly presented some theoretical explanations concerning environmental aspects from the NW perspective and, secondly, has also briefly provided an overview of China's transitional economic process and the major challenges it faces. A specific introduction concerning Chinese agriculture and the empirical investigation targets in the agribusiness sector will be presented in sections 3.3.2.3.1 and 3.3.2.3.2. The following section presents literature regarding variable performance.

2.4.5 Performance

Performance is a recurrent theme in most branches of management, including strategic management, and it is often of interest to both academic scholars and managers (Venkatraman and Ramanujam, 1986). While prescriptions for improving and managing organizational performance are widely available, the academic has been preoccupied with discussions and debates about issues of terminology, levels of analysis (i.e., individual, work unit, or organization as a whole), and conceptual bases for assessment of performance. Although the importance of the performance concept is widely recognized, the treatment of performance in research settings has been perhaps one of the thorniest issues confronting the academic researcher. Previous research evidences a lack of agreement on basic terminology and definitions. It also evidences significant differences in the operationalization of the concept (Venkatraman and Ramanujam, 1986).

According to Venkatraman and Ramanujam (1986) business performance reflects the perspective of organizational effectiveness. The narrowest conception of business performance centers on the use of simple outcome based financial indicators that are assumed to reflect the fulfillment of the economic goals of the firm. The authors referred to this concept as financial performance, which has been the dominant model in empirical strategy research. These approaches would typically examine such indicators as sales growth, profitability (reflected by ratios such as return on investment, return on sale, and return on equity), earnings per share and so forth (Toral 2000:97). A broader conceptualization of business performance would include emphasis on indicators of operational performance (i.e., non-financial) in addition to indicators of financial performance. Under this framework it would be logical to treat such measures as market share, new product introduction, product quality, marketing effectiveness, manufacturing value-added (and other measures of technological efficiency) within the domain of business performance. Similarly, a market share position, widely believed to be a determinant of profitability, would be a meaningful indicator of performance within this perspective. “The inclusion of operational performance indicators takes us beyond the “black box” approach that seems to characterize the exclusive use of financial indicators and focuses on those key operational success factors that might lead to financial performance”(Venkatraman and Ramanujam, 1986). According to the authors, if the multiple and conflicting nature of organizational goals and the influence of multiple stakeholders are superimposed, one can move towards reflecting the writings on organizational effectiveness. Perhaps due to the breath of this discourse, this literature is plagued with debates on appropriate models of measurement. Most strategy studies have restricted their focus to the first two circles as indicated in Figure 25 (Toral 2000:97)-which provides a schematic for circumscribing the domain of business performance in terms of the scope of coverage in the concept’s domain.

Figure 25: Circumscribing the Domain of Business Performance



Source: Based on Venkatraman, N. and V. Ramanujam (1986). “Measurement of business performance in strategy research: a comparison of approaches”, *Academy of Management Review*, 1(4), pp. 803. (Toral 2000: 98)

“In developing performance criteria it may be useful to classify performance measures along a continuum ranging from input to output measures. At the output

extreme are the “results” measures that most people use to assess current performance. At the input extreme are indicators of states. The input extreme represents variables that should determine (create) measurable results. Inputs represent what the organization is doing, how it is struggling to achieve eventual results (outputs). Inputs are not themselves measures of the results most commercial organizations set as goals. Measurement of performance relates to the original objectives set by the participants to a specific cooperative arrangement. An original objective can be that of achieving an economic stability, survival in a tough market turbulence, consolidating a targeted market position, maintain dependence, independence ...innovation, profitability, shareholder value and failure rate. Performance sentiment is a nominal measure composed of dissatisfaction and satisfaction. Satisfaction is a positive affective assessment of the relationship between two firms, whereas dissatisfaction is a negative assessment. These affective outcomes are consistent with previous interorganizational exchange models” (Anderson and Narus, 1990; Frazier, 1983; Frazier, Spekman, and O’Neal, 1988). Firms will be happier with the relationship, if both firms met the goals. Sometimes, goals may not be met due to uncontrollable factors. If firms perceive that other partner exerted effort and fulfilled their obligations, both sides may still be satisfied with the relationship, even though strategic gaps may remain unfilled. If the gaps are being filled, satisfaction results from these outcomes and from the process of working together for mutual benefits. Zand (1972) empirically proposed that trusting cooperative behavior leads to satisfaction in organizational relationships, while Frazier (1983) showed that conflict leads to dissatisfaction with the relationship.

Harrison and Shirom (1998) outlined four major theoretical approaches for assessing effectiveness found in the literature. Each approach to assessment leads to different types of assessment criteria (Cameron, 1980; Kanter and Brinkerhoff, 1981; Lewin and Minton, 1986). Table 14 below shows that the output-goal approach to assessing effectiveness derives from an instrumental frame that views organizations as goal-attainment devices and assesses effectiveness in terms of the attainment of clearly defined objectives and the production of specific outputs.

The second approach focuses on internal system states and draws on the open systems and human resources frames (Bolman and Deal, 1991). Improving quality of work life, satisfaction, and motivation yields long-term benefits, as well as immediate performance improvements. The development of a loyal and flexible workforce helps organizations weather crises and enhances employee cooperation during period of strategic change.

The third approach stresses system resources and adaptation. It stems mainly from open systems theories that evaluate effectiveness in terms of the organizational ability to obtain scarce and valued resources from its environment, adapt to external change, and obtain a favorable competitive position within the environment.

The fourth approach focuses on the assessments made by multiple stakeholders and defines effectiveness in terms of the organization’s ability to satisfy a diverse set of internal and external constituencies (Connolly, Conlon, and Deutsch, 1980; Gaertner and Ramnarayan, 1983).

The multiple stakeholder approach, which derived from the political frame, has become widely accepted in organizational research (Bedeian, 1987; Kanter and Summers, 1987; Zammuto, 1984; Harrison and Shirom, 1998:76-78). The four theoretical approaches are presented in Table 14.

Table 14: Effectiveness Approaches and Definitions

<i>Approach and Domains</i>	<i>Criteria</i>
1. Output Goals	
Goal attainment	Achievement of main objectives (e.g., airport construction)
Outputs-quantity	Productivity (number of value of sales, services- sometimes per unit or cost of labor); profits, revenues
Output-quality	Reliability (e.g., rejects, returns); reputation (customer satisfaction, expert ratings); institutional standards (e.g., approval by quality assurance body)
2. Internal System State	
Efficiency and cost	Efficiency measures (e.g., output value/cost with constant quality); wastage; costs per unit of output
Human outcomes	Quality of work life (satisfaction with pay, working conditions); work effort and commitment (low absenteeism, turnover); employee health and safety; motivation; organizational image; citizenship behavior
Consensus/conflict	Goal and procedural consensus; cohesion (manual attraction and identification with work group and organization); cooperation within and between units;
Work and information flows	Work coordination (smooth flow of products, information between units; few delays and snags); adequacy and quality of information, multidirectional flows
Interpersonal relations	Trust; moderation of status differences (reduced prominence of status symbols and executive perks), openness, honesty of interpersonal communication, acceptance of diverse backgrounds and orientations
Employee involvement	Empowerment; participation in decision making
Fit	Alignment of internal system, components, subcomponents, and features
3. System Resources and Adaptation	
Resources-quantity	Size (employees, physical, financial, capital assets); resource flows (sales, budget allocations)
Resources-quality	Human capital (training, experience of work force); staff reputation; knowledge base; desirability of clients (e.g., college selectivity)
Adaptation	Ability to cope with external change and uncertainty; crisis management capabilities
Proactiveness	Impact on environment-clients (e.g., demand), competitors, suppliers, regulations; entrepreneurialism
Innovativeness	Technological and administrative innovation; implementation of new techniques and ideas
Legitimacy	Support by community and by public agencies or regulators; compliance with legal, professional, regulatory standards
Competitive position	Standing compared to competitors (e.g., market share); reputation for leadership in industry or sector
Fit	Alignment of internal system with environment
4. Multiple Stakeholder Assessment Standards	
Standards	Effectiveness domains and criteria selected and defined by stakeholders
Satisfaction	Satisfaction with organization on standards specified by stakeholders; stakeholders' overall level of satisfaction with organization

(Source: Michael I. Harrison and Arie Shirom (1998) in "Organizational Diagnosis and Assessment, Bridge Theory and Practice" SAGE Pp: 76-77)

Likewise, Tsui (1994) said that accumulating evidence indicates that organizations are more responsive to the expectations of multiple stakeholders and are generally more adaptable than comparable organizations in which less attention is given to stakeholders. Stakeholder theories of effectiveness rest substantially on the normative assertion that internal and external stakeholders have legitimate interests in the substantive and procedural aspects of corporate activity (Donaldson and Preston, 1995; Harrison and Shirom, 1998: 78).

Snow and Thomas (1993) measured the outcomes of three types of NWs - the internal, stable, and dynamic NWs - by focusing on five variables: 1) **NW performance**; 2) **NW politics**; 3) **information processing structure**, 4) **the brokers' conflict management style**; and 5) **the leadership style of the broker**. In order to measure objectively the performance of a NW organization during its creation and development, Snow and Thomas (1993) used a perceptual measure of NW

performance similar to that of Fornell, Lorange, and Roos (1990) and adopted the specific performance factors from Fottler's (1987) discussion of health care organization performance which include: (1) financial performance (short – and long-term profitability, growth, market share); (2) innovation, prestige, and service range; and (3) satisfaction of physician needs and concerns. Moreover, NW politics refers to conflict that emerges among various groups due to their different perspectives and preferences (Cyert and March, 1963; Snow and Thomas 1993). "Politics is especially important to NW organizations because the various members of the NW must work together as well as pursue their own self-interests." NW political activity was operationalized along six dimensions: **goals and preferences, decision process, rules and norms, information requirements, information use, and decision outcomes** (Pfeffer, 1981:31; Snow and Thomas, 1993:224). Information processing structure refers to the degree of formality, interaction, and participation among the managers associated with the NW development process. Conflict management style refers to the broker's style of managing conflict in terms of the extent of the disagreements over which the NW creation issues were resolved by (a) executive order, (b) debate, (c) compromise, and (d) accommodation. An executive order approach to conflict management indicates autocratic behavior on the part of the broker while the debate, compromise, and accommodation styles indicate more collaborative conflict management approaches. The debate, compromise, and accommodation styles have been identified as collaborative approaches at the interorganizational level (Brown, 1982). Finally, concerning the broker's leadership style. Four dimensions were used to measure the variable: task orientation, people orientation, facilitation, and supportiveness (Bass, 1981:331; Snow and Thomas, 1993).

2.4.6 Summary

The preceding sections presented literature review and empirical findings covering the selected NW variables of actors, resources, structural and relational properties of NWs. The presentation of the formal structure of the relations in a NW included different indicators of relations; the power and influence in a NW and key measurements of centrality; the roles and behaviors of actors in particular, the brokers in the different types and life cycle of NWs; environmental aspects and, finally, NW performance measurements. Chapter 2, has grouped important theoretical and past empirical findings in relation to the research problems of this research and has, therefore, provided a useful framework for guiding the empirical investigation process in the subsequent chapters of this dissertation.

2.5 CONCLUSIONS

Chapter 2 reviewed the literature presenting 1) the main theoretical explanations of alliance formation between firms; 2) a global view of NWs covering the most important aspects of NW form organizations and 3) the key NW variables affecting the NW building process and outcomes and the interrelations between these variables. The succeeding empirical research of this dissertation will be carried out along the research questions, and theoretical framework built up in this chapter.

Chapter 3 describes the methodology to be used for providing data to investigate the research questions. It aims to provide assurances that appropriate research strategy were adopted and proper procedures were followed.

3 METHODOLOGY

3.1 INTRODUCTION

Chapter 1 identified the research questions and determined a framework of selected key variables to be analyzed. Along this framework, Chapter 2 presented different theoretical explanations to the strategic conduct of firms in forming strategic alliances and the key variables influencing the NW building process and outcomes. Chapter 3 describes the methodology used to provide data to investigate these research questions. The objective of this chapter is to provide assurance that appropriate procedures are followed in building on the introduction of the methodology provided in section 1.4 of chapter 1. This chapter begins presenting the different paradigms used in qualitative research as well as their practical implications; a qualitative description of research particularities then follows, finally introducing the case study approach and design of this research.

3.2 THE FOUR PARADIGMS

According to Yin (1994) various approaches are used to conduct investigations in social sciences research. Quantitative and qualitative researches are labels frequently used to distinguish between two different methodological approaches. Depending on the context, the research question, and the depth of knowledge in a specific area, either quantitative or qualitative methodologies are used. This dissertation opts for a qualitative research methodology. Section 3.3.2 provides a detailed explanation of the choice. Choosing between a quantitative or qualitative methodology obliges a researcher to think about paradigm issues because they have significant implications at the practical level. Denzin and Lincoln (1994:116) argued that no inquirer ought to go about the business of inquiry without being clear about just what paradigm informs and guides his or her approach. According to Denzin and Lincoln (1994:105) there are four paradigms that are currently competing for acceptance as the paradigm of choice in informing and guiding inquiry, and especially qualitative inquiry. These are: positivism, postpositivism, critical theory and related ideological positions, and finally constructivism (Toral 2000:110).

Positivism has dominated scientific research for centuries because historically, there has been a heavy emphasis on quantification in science. Mathematics is often termed as the “queen of sciences,” and those sciences such as physics and chemistry, that lend themselves especially well to quantification, are generally known as “hard”. Less quantifiable arenas such as the social sciences, are referred to as “soft”- less with pejorative intent rather than signaling their (putative) imprecision and lack of dependability. Scientific maturity is commonly believed to emerge as the degree of quantification found within a given field increases (Denzin and Lincoln, 1994). The “received view” of science (positivism, transformed over the course of this century into post positivism) focuses on efforts to verify (positivism) or falsify (post positivism) a priori hypotheses - most usefully stated as mathematical (quantitative) propositions, or propositions that can be easily converted into precise mathematical formulas expressing functional relationships. Formulaic precision has enormous utility when the aim of science is the predication and control of natural phenomena. What more, there is already an existence of a powerful array of statistical and

mathematical models. Finally, a widespread exists conviction that only quantitative data is ultimately valid, or of high quality. Nevertheless, principles ensuing “exact” sciences were too rigid to correspond to social sciences research requirements. Social scientists developed alternative paradigms that reconsidered the utility of qualitative data and questioned the very assumptions on which the putative superiority of quantification has been made (Denzin and Lincoln, 1994).

3.2.1 The Nature of Paradigms

According to Denzin and Lincoln (1994), a paradigm may be viewed as a set of basic beliefs (or metaphysics) that deals with ultimate or first principles. A paradigm represents a worldview that defines, for its holder, the nature of the “world,” the individual place in it, and the range of possible relationships to that world and its parts. The beliefs are basic in the sense that they must be accepted simply on faith. And no matter however well argued, there is no way to establish their ultimate truthfulness. The authors continued: “inquire paradigms defines for inquirers what it is they are about, and what falls within and outside the limits of legitimate inquiry. The basic beliefs that define inquiry paradigms can be summarized by the responses given by proponents of any given paradigm to three fundamental questions, which are interconnected in such a way that the answer given to any one question, taken in any order, constraints how the others may be answered.

1. *“The ontological question. What is the form and nature of reality and, therefore, what is there that can be known about it. For example if a “real” world is assumed, then what can be known about it is “how things really are” and “how things really work.” Then only those questions that relate to matters of “real” existence and “real” action are admissible; other questions, such as those concerning matters of aesthetic or moral significance, fall outside the realm of legitimate scientific inquiry.*
2. *The epistemological question. What is the nature of the relationship between the knower or would-be knower and what can be known? The answer that can give to this question is constrained by the answer already given to the ontological question; that is not just any relationship can be postulated. So if, for example, a “real” reality is assumed, then the posture of the knower must be one of objective detachment or value freedom in order to be able to discover “how things really are and work”.*
3. *The methodological question. How can the inquirer (would be knower) go about finding out whatever he or she believes can be known? Again, the answer that can be given to this question is constrained by answers already given to the first two questions; that is not just any methodology is appropriate. For example, a “real” reality pursued by an “objective” inquire mandates control of possible confounding factors, whether the methods are qualitative (say, observational) or quantitative (say, analysis of covariance). (Conversely, selection of a manipulative methodology - the experiment, say-implies the ability to be objective and a real world to be objective about.) The methodological question cannot be reduced to a question of methods; methods must be fitted to a predetermined methodology.”* These three questions serve as the major foci around which the four paradigms are analyzed (Toral 2000:111,112).

3.2.2 Different Inquiry Paradigms

According to Denzin and Lincoln (1994) “paradigms, as sets of basic beliefs, are not open to proof in any conventional sense; there is no way to elevate one over another on the basis of ultimate, foundational criteria. Any given paradigm represents simply the most informed and sophisticated view that its proponents have been able to devise, given the way they have chosen to respond to the three defining questions. The sets of answers given are in all cases human constructions; that is they are all inventions of the human mind and hence subject to human error. No construction is or can be incontrovertibly right” (Toral 2000:113).

3.2.3 Intraparadigm Analyses

“The term positivism denotes the “*received view*” that has dominated the formal discourse in the physical and social sciences for some 400 years, whereas postpositivism represents efforts of the past few decades to respond in a limited way (that is while remaining within essentially the same set of beliefs) to the most problematic criticisms of positivism. The authors use the term critical theory as a blanket term denoting a set of several alternative paradigms, including additionally neo-Marxism, feminism, materialism, and participatory inquiry. The term constructivism denotes an alternative paradigm whose breakaway assumption is the move from ontological realism to ontological relativism” (Denzin and Lincoln, 1994). According to the authors, the paradigms discussed here are limited to social sciences and are still in formative stages; no final agreement has been reached even among their proponents about their definitions, meanings, or implications (Toral 2000:113). Table 15 presents the different inquiry paradigms.

Table 15: Basic Beliefs (Metaphysics) of Alternative Inquiry Paradigms

Item	Positivism	Postpositivism	Critical theory et al.	Constructivism
Ontology	Naive realism. “Real reality” but apprehendable	Critical realism “real reality: but only imperfectly and probabilistically apprehendable	Historical realism-virtual reality shaped by social, political, cultural, economic, ethic, and gender value; crystallized over time	Relativism – local and specific constructed realities
Epistemology	Dualist / objectivist; findings true	Modified dualist /objectivist; community; findings probably true	Dialogic / dialectical	Transactional / subjectivist; created findings
Methodology	Experimental /manipulative; verification of hypotheses; chiefly quantitative methods	Modified experimental / manipulative; critical multiplism; falsification of hypotheses; may include qualitative methods	Dialogic / dialectical	Hermeneutical dialectical

(Source: based on Denzin, N.K. and Y.S. Lincoln (1994) Handbook of Qualitative Research. London, Sage: 109, in Toral 2000:115).

Positivism

“Ontology: Realism (commonly called: “naive realism”). An apprehendable reality is assumed to exist, driven by immutable natural laws and mechanisms. Knowledge of the “way things are” is conventionally summarized in the form of time-and context-free generalizations, some of which take the form of cause-effect laws. Research can,

in principle converge on the “true” state of affairs. The basic posture of the paradigm is argued to be both reductionist and deterministic.

Epistemology: Dualist and objectivist. The researcher and the investigated “object” are assumed to be independent entities, and the researcher to be capable of studying the object without influencing it or being influenced by it. When influence in either direction (threats to validity) is recognized, or even suspected, various strategies are followed to reduce it or eliminate it. Values and biases are prevented from influencing outcomes, so long as the prescribed procedures are rigorously followed. Replaceable findings are, in fact, “true.”

Methodology: Experimental and manipulative. Questions and /or hypotheses are started in prepositional form and subjected to empirical test to verify them; possible confounding conditions must be carefully controlled (manipulated) to prevent outcomes from being improperly influenced.”

Postpositivism

“Ontology: Critical realism. Reality is assumed to exist but to be only imperfectly apprehendable because of basically flawed human intellectual mechanisms and the fundamentally intractable nature of phenomena. The ontology is labeled as critical realism because of the posture of proponents that claims about reality must be subjected to widest possible critical examination to facilitate apprehending reality as closely as possible (but never perfectly).

Epistemology: Modified dualist /objectivist. Dualism is largely abandoned as not possible to maintain, but objectivity remains a “regulatory ideal”; special emphasis is placed on external “guardians” of objectivity such as critical traditions (Do the findings “fit” with preexisting knowledge”) and the critical community (such as editors, referees, and professional peers). Replicated findings are probably true (but always subject to falsification).

Methodology: modified experimental / manipulative. Emphasis is placed on “critical mutiplism” (a refurbished version of tradition) as a way of falsifying (rather than verifying) hypotheses. The methodology aims to redress some of the problems noted above (intraparadigm critiques) by doing inquiry in more natural settings, collecting more situational information, and reintroducing discovery as an element in inquiry, and, in the social science particularly, soliciting emic viewpoints to assist in determining the meanings and purposes that people ascribe to their actions, as well as contribute to “grounded theory” all of these aims are accomplished largely through the increased utilization of qualitative techniques.”

Critical theory and related ideological positions

“Ontology: Historical realism. A reality is assumed to be apprehendable that was once plastic, but that was, over time shaped by a congeries of social, political, cultural, economic, ethic, and gender factors, and then crystallized (reified) into a series of structures that are now (inappropriately) taken as “real” that is, natural and immutable. For all practical purposes the structures are “real,” a virtual or historical reality.

Epistemology: Transactional and subjectivist. The investigator and the investigated object are assumed to be interactively linked, with the values of the investigator (and of situated “theirs”) inevitably influencing the inquiry. Findings are therefore value mediated. Note that this posture effectively challenges the traditional distinction between ontology and epistemology; what can be known is inextricably intertwined with the interaction between a particular investigator and a particular object or group. The dashed line separating the ontological and epistemological rows in Table 11 is intended to reflect this fusion.

Methodology: Dialogic and dialectical. The transactional nature of inquiry requires a dialogue between the investigator and the subjects of the inquiry; that dialogue must be dialectical in nature to transform ignorance and misapprehension (according historically mediated structures as immutable) into more informed consciousness (seeing how the structure might be changed and comprehending the actions required to effect change).”

Constructivism

“Ontology: Relativist. Realities are apprehendable in the form of multiple, intangible mental constructions, socially and experientially based, local and specific in nature (although elements are often shared among many individuals and even across cultures), and dependent for their form and content on the individual persons or groups holding the constructions. Constructions are not more or less “true,” in any absolute sense, but simply more or less informed and / or sophisticated. Constructions are alterable, as are their associated “realities.”

Epistemology: transactional and subjectivist. The investigator and the object of investigation are assumed to be interactively linked so that the “findings” are literally created as the investigator proceeds. The conventional distinction between ontology and epistemology disappears, as in the case of critical theory. Again the dashed line in Table 11 reflects this fact.

Methodology: Hermeneutic and dialectical. The variable and personal nature of social constructions suggests that individual constructions can be elicited and refined only through interaction between and among investigator and respondents. These varying constructions are interpreted using conventional hermeneutic techniques, and are compared and contrasted through a dialectical interchange. The final aim is to distill a consensus construction that is more informed and sophisticated than any predecessor constructions (including, of course, the etic construction of the investigator)” (Toral 2000: 113-118).

3.2.4 The Consequence of Different Paradigm’s Position

According to Denzin and Lincoln (1994) differences in paradigm assumptions cannot be dismissed as mere “philosophical” differences; implicitly or explicitly, these positions have important consequences for the practical conduct of inquiry, as well as for the interpretation of findings and policy choices (Toral 2000:118). Table 16 summarizes the major implications provided by Denzin and Lincoln (1994).

Table 16: Paradigm Positions on Selected Practical Issues

Issue	Positivism	Postpositivism	Critical theory et al.	Constructivism
Inquiry aim	Explanation: prediction and control		Critique/transformation; restitution and emancipation	Understanding; reconstruction
Nature of knowledge	Verified hypotheses established as facts or laws	Non falsified hypotheses that are probable facts or laws	Structural/historical insights	Individual reconstruction coalescing around consensus
Knowledge accumulation	Accretion –“building clocks” adding to: edifices of knowledge”; generalizations and cause-effect linkages		Historical revisionism; generalization by similarity	More informed and sophisticated reconstructions; vicarious experience
Goodness or quality criteria	Conventional benchmarks of “rigor” internal and external validity, reliability, and objectivity.		Historical situatedness; erosion of ignorance Action stimulus	Trustworthiness and authenticity and misapprehensions
Value	Excluded –influence denied		Included - formative	
Ethics	Extrinsic; tilt towards deception		Intrinsic; moral tilt towards revelation	Intrinsic; process tilt towards relation; special problems
Voice	“Disinterested scientist” as informer of decision makers, policy makers, and change agents		“Transformative intellectual” as advocated and activist	“Passionate participant” as facilitator of multi-voice reconstruction
Training	Technical and quantitative; substantive theories	Technical; quantitative / qualitative substantive theories	Resocialization; qualitative and quantitative; history; values of altruism and empowerment	
Accommodation	Commensurable		Incommensurable	
Hegemony	In control of publication, funding, promotion, and tenure		Seeking recognition and input	

(Source: bases on Denzin, N.K. and Y.S. Lincoln (1994). Handbook of qualitative Research. London, Sage.112, in Toral, 2000:119)

The case study research strategy is chosen for this dissertation in order to gain access to context specific information describing the motives of companies in the agribusiness sector forming NW from organizations and the causes of success and failure of their formation and development in relation to the brokers’ role. The key variables influencing the NW building process have been learned from previous research in the field. The empirical part of this investigation tries to explore how these variables behave in the context of the transitional economy environment in China, and if the results of this study verify or bring new insights to the previous ones.

In the coming sections, the reasons for choosing qualitative research as a research strategy are explained. The characteristics of a chosen case study and how these characteristics are applied to this study is also explained.

3.3 QUALITATIVE RESEARCH - JUSTIFICATION

As defined in the research questions, this dissertation intends to gain a holistic (systemic, encompassing, integrated) overview of the rationales of enterprise’s involvement of NWs, and particularly the impact of the broker’s functioning in the NW building process in relation to the overall NW performance in the defined China context of this study. To achieve this, the key variables of NWs - actors and their

activities, structure of the relations, roles and behavioral patterns, resources, environment and performance are to be analyzed.

Qualitative methods are more suited for this particular research due to the needs for comprehensiveness and the limited number of subjects (actual cases) available. The research process is mainly composed of data sources, interpretive or analytical procedures, identification of conceptualizing the data and reporting the findings and presenting the acquired academic knowledge. The research was largely a field activity with analysis essentially being qualitative, interpretative, and non-mathematical. Therefore, a qualitative method - case study has been chosen as the research strategy for this dissertation. The following literatures explain the appropriateness and provide theoretical justification of the decision.

According to Strauss and Corbin (1990) qualitative research implies any kind of research that produces findings which are not arrived at by means of statistical procedures or other methods of quantification. Kirk and Miller (1986) define qualitative research as the tradition within social territory that fundamentally depends on watching people in their own territory and interacting with them in their own language, on their own terms. Thus, qualitative research is committed to field activity. Even though the data may be quantitative (for example: documents, observations, census data etc.) the process of analysis is essentially qualitative, interpretative, and non-mathematical (Toral 2000:121).

Three major components of qualitative research seem to recur and categorize the qualitative approach. 1) Data source, 2) interpretative or analytical procedure of conceptualizing the data, and 3) reporting (Strauss and Corbin, 1990). Data source essentially stems from the scientist conducting research within the field. After the data collection phase, the researcher interprets and conceptualizes the data. This includes the distinction between data and noise¹³, considering a research situation and problems as well as reflecting upon the research tools. After having interpreted the data, the researcher reports the findings and presents the acquired academic knowledge. Since no prepackaged designs of qualitative research exist, data collection and analysis depend on the aims, objectives, and focus of the research question.

Different research methods and theoretical traditions fall under the category of qualitative research. Miles and Huberman (1994: 5-7) present some recurring features of this type of research (Toral 2000:120):

- Qualitative research conducted through an intense and /or prolonged contact with a “field” life situation. These situations are typically (but not exclusively) “banal” or normal ones - reflective of the everyday life of individuals, groups, societies, and organizations.
- The research role is to gain a “holistic” (systemic, encompassing, integrated) overview of the context under study: its logic, its arrangements, and its explicit and implicit rules.
- The researcher attempts to capture data on the perceptions of local actors “from the inside.” Through a process of deep attentiveness, of empathetic understanding, and of suspending or “bracketing” preconceptions about the topics under discussion.
- Reading through these materials, the researcher may isolate certain themes and expressions that can be reviewed with informants, but which should, never-the-less, be maintained in their original forms throughout the study.

¹³ “Noise” is the term used for unaccountable variance in the data (Lincoln and Guba, 1985)

- A main task is to explicate the ways in which people in particular settings come to understand, account for, take action, and otherwise manage their day-to-day situations.
- Many interpretations of this material are possible, but some are more compelling for theoretical reasons or on grounds of internal consistency than others.
- Relatively little standardized instrumentation is used at the outset. The researcher is the main “instrument device” in the study.
- Most analysis is done with words by establishing patterns.

3.3.1 Research Strategy - Case Study

The case study (CS), like other research strategies, is a way of investigating an empirical topic by following a set of pre-specified procedures (Yin 1989:25). A more “technical” definition of case study is as follows (Yin, 1981a, 1981b 1989 p: 23): **“A case study is an empirical inquiry that investigates a contemporary phenomenon within its-real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.”**

According to Yin (1989:13) the case study constitutes several ways of doing social science research. Other ways include experiments, surveys, histories, and archival information (as in economic studies). Yin further argued: “we were once taught to believe that CSs were appropriate for the exploratory phase of an investigation, that surveys and histories were appropriate for the descriptive phase, and that experiments were the only way of doing explanatory or causal inquiries. This view is incorrect; the more appropriate view of these different strategies is a pluralistic one. Each strategy can be used for three purposes, exploratory, descriptive, or explanatory. What distinguishes the strategies is not the hierarchy, but three other conditions: **the type of research question posed, the extent of control a researcher has over actual behavioral events, and the degree of focus on contemporary as opposed to historical events.**”

Table 17 displays these three conditions, in each of the three columns, and shows how each strategy is related to five major research strategies in the social science: “experiments, surveys, archival analysis, histories and case studies.” Yin (1989:13) generalized that case studies are the preferred strategy when “how” or “why” questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context.

Table 17: Relevant Situations for Different Research Strategies

Strategy	Forms of Research Question	Requires Control over Behavioral Events?	Focuses on Contemporary Events?
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archival analysis (e.g., economic study)	Who, what, where, how many, how much	No	Yes/no
History	How, why	No	No
Case study	How, why	No	Yes

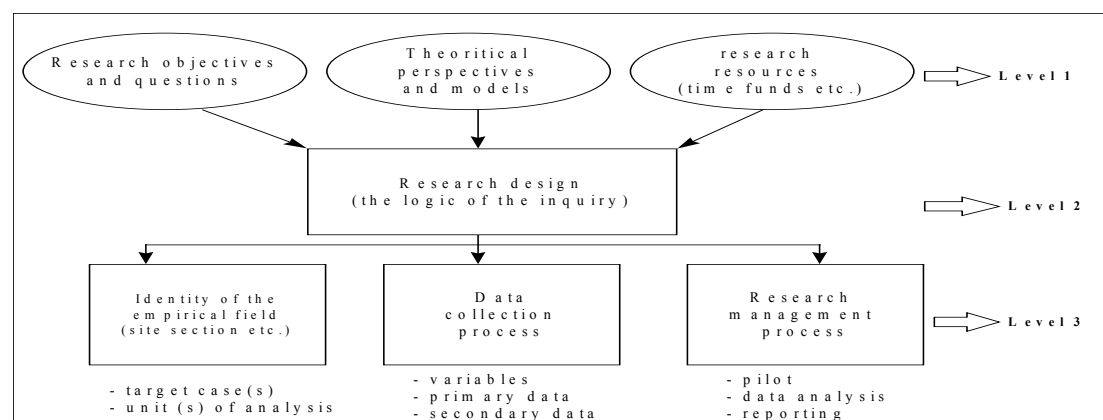
(Sources: Yin, Robert (1989). Case Study Research: Design and Methods. Sage. Pp. 17)

To take the first condition of Yin (1989:13), **the type of research question posed**, using case study strategy for this dissertation is justified by the research questions as identified in Chapter 1, which are “why” and “how” type questions (why do firms form strategic NWs in the agribusiness sector in the context of the transitional Chinese economy? Why do some NW formation succeed while some fail in the agribusiness sector in the context of the transitional economy of China - with special emphasis to the broker role? How does a broker effectively perform its role in the context of transitional Chinese economy - in terms of formation, sustainable development and performance of strategic NWs?). These types of questions, in contrast to the frequency questions of “what”, “who” or “when,” involve investigations through intense and /or prolonged contact with the field situation. The evaluation based-on the other two conditions of Yin (1989; 13), **the extent of control a researcher has over actual behavioral events** and **the degree of focus on contemporary as opposed to historical events**, also supports the decision of using case study for this research. Histories are preferred when there is virtually no access or control.¹⁴ The case study is preferred in examining contemporary events, but when relevant behaviors cannot be manipulated many same techniques such as history are used but add two sources of evidence: direct observation and systematic interviewing. The CS has a unique strength (as opposed to history) in dealing with a full variety of evidence. Besides, in some situations (such as participant observation) informal manipulation can occur. Finally, experiments are done when research can manipulate behavior directly, precisely, and systematically. This can occur in laboratory setting or in a field setting. To conclude, using the case study strategy in this research is justified by the distinct advantage of the CS over the other strategies. The research questions in this study are “how” and “why” types - in relation to a contemporary set of events which is out of researcher’s control. The following section explains the procedures of case study process.

3.3.2 Designing Case Research

This research has been planned from the initial design to data collection, analysis and report stages according to the case study process presented by Borum (1991). Figure 26 shows the overall process.

Figure 26: The Central Function of a Research Design



(Source: Based on Yin, R. (1993) Application of Case Study Research. Newbury, Sage. Pp. 110 in Toral 2000)

¹⁴ In dealing with the dead past, no relevant persons are alive to report - even retrospectively – has occurred, when an investigator must rely on primary and secondary documents or cultural and physical artifacts as the main sources of evidence.

3.3.2.1 Influential Factors to the Research Design

According to level 1 in Borum's model in Figure 26, three factors influence the research design: 1) research objectives and questions, 2) theoretical perspectives and models and finally 3) research resources. These three factors in this dissertation are explained as follows:

1) Research objectives and questions

The research objectives in this dissertation are mainly descriptive and explanatory.¹⁵ The research questions guided the literature review, which in turn lead to the elaboration of a questionnaire contenting major themes in relation to the NW building process, the NW management, relationship patterns between different actors, the activities and roles played by the actors in different type of NWs and, in particular, the impact of brokers' roles and behavior to the NW performance.

2) Theoretical perspectives and models

Yin (1993) argues that theory can be important to case studies design in different ways.

- The development of theory prior to the conduct of the study can be considered as critical because this approach to case studies mimics that used in experimental science - where expert knowledge of prior research and careful hypothesis development precede actual experimentation. The approach requires to be well informed about the topics of inquiry. Further, the approach gives an opportunity to reveal (and minimize) substantive biases that may affect the design and conduct of the CS. Additionally, the approach produces CSs that can be part of a cumulative body of knowledge rather than just isolated empirical inquiries.

- Theory is important for descriptive CSs because it defines a complete and appropriate description when doing this type of research. A descriptive theory is not an expression of a cause-effect relationship. Rather a descriptive CS covers the scope and depth of the object (case) being described. If you were to describe an individual, and organization, or some other possible subject of a CS, "where should the description start, and when should it end? What should the description include and what should be excluded?" The criteria used to answer these questions would represent the "theory" of what needs to be described. This theory should be stated ahead of time, should be subject to review and debate, and should later serve as the "sign" for a descriptive CS. The more thoughtful the theory, the better the descriptive case will be.

- Theory is important for explanatory CSs because by developing a set of rival explanatory theories, and by collecting the appropriate data, the investigator can empirically test the theories using pattern matching.¹⁶

- Finally, theory allows generalization from CS. The appropriately developed theory is the level at which the generalization of the CS results will occur. This role of

¹⁵ Descriptive case studies present a complete description of a phenomenon within its context, explanatory case studies present data bearing on cause-effect relationships (Yin, 1993)

¹⁶ Pattern matching is the logic that an empirically based pattern with a predicated one (or with several alternative predictions). It allows an investigation to conclude that there is a causal relationship between two variables (Yin, 1994:106)

theory is characterized by Yin (1993) as “analytical generalization” and is contrasted “statistical generalization.” In statistical generalization, an inference is made about a population (or universe) based on empirical data collected about a sample. This method of generalizing is commonly recognized because research investigations have ready access to formulas for determining the confidence with which generalizations can be made, depending mostly upon the size and internal variation within the universe and sample. This is the most common way of doing surveys and it is an integral part of generalizing from experiments.

The method of generalizing the results of CSs is not statistical generalization. This is because cases are not “sampling units” and should not be chosen for this reason. Rather, individual CSs are to be selected as a laboratory investigator selects the topic of a new experiment. Multiple cases, in this sense, should be considered like multiple experiments (or multiple surveys). Under these circumstances, the method of generalization is “analytical generalization” in which a previously developed theory is used as a template with which to compare the empirical results of the CS. If two or more cases are shown to support the same theory, replication may be claimed. Section 3.3.2.2.2 provides an explanation of multiple-case design.

Learning the theories developed in the field by past research findings were the first step. The theories have provided a broad understanding in the field and served as guidelines to pursue the research. In chapter 2, a theoretical framework has been developed covering a variety of perspectives explaining interorganizational cooperation, NW building process, and the major affecting variables. The approach gave an opportunity to reveal (and minimize) some potential biases that may affect the design and conduct of the case study and further, linking the empirical inquiries to the body of knowledge. As a direct result of elaborating the theoretical framework, some propositions were generated, and these propositions served as useful guidelines to construct the interview questionnaire of this research.

3) Research resources

This dissertation and the empirical part of the study, in particular, require that several research sites that fit to the analytical frame, be identified in the agribusiness sector in China. The investigation process involves traveling from Switzerland to China and in distant regions within the country. Finding suitable cases to be investigated was a time consuming and costly activity. In order to fulfill the targeted time schedule there was no time to search for financial support from any potentially interested organizations such as the World Bank, the Asian Development Bank, or governmental organizations and enterprises in China. Consequently, the project was self-financed. This research project benefits from the support of the researcher’s personal and business contacts established in the targeted industrial sector. Shanghai Agricultural Means and Production Corporate (SAMPC) has provided several candidate research sites. Among them, three were chosen, and helped to coordinate data collection process with fifteen organizations/individuals from the three selected sites. In addition, SAMPC also provided a transportation vehicle during the investigation process in Shanghai. In Beijing and the western region of Shanxi, the Beijing Academy of Agriculture and Forestry Sciences (BAAFS) and Shanxi ZhongHe Bio-fertilizer, Limited provided support in obtaining cases and in coordinating data collection operations.

3.3.2.2 Research Design (the logic of the inquiry)

Philliber, Schwab, and Samsloss (1980) defined the research design as an action plan for getting from here to there, a “blueprint” of research, dealing at least four problems: the questions to be studied, the relevance of data, the data to be collected, and how to analyze the results. The research design is much more than a work plan. The main purpose of the design is to help avoid a situation in which the evidence does not address the initial research questions. In this sense, the research design deals with a logical problem and not a logistic problem.

Yin (1989, 1994: 27) further explained this point, “a research design is the logic that links the data to be collected (and the conclusions to be drawn) to the initial questions of study.” It is a technical plan that deals with the resources, logistics, scheduling, and assignment of personnel, and other tasks involved in managing a research project. It attempts to link the beginning and ending of a study. The role of a research design is to assure that the evidence to be collected is pertinent to the questions of a study and that the analytical strategies cover the rival hypotheses or competing concerns of a CS. It is a logic plan, connecting study questions with data collection and interpretation and conclusions - not just a logistics plan (Yin, 1994).

3.3.2.2.1 Basic Types of Designs for Case Study

Yin (1989:46) discusses four types of case designs deriving from a 2 X 2 matrix, as shown in Figure 27. The assumption of the matrix is that single and multiple-case studies reflect different design considerations, and that within these two types there can also be unmilitary or multiple units of analysis. For the CS strategy, the four types of designs are (1) single-case (holistic) design, (2) single-case (embedded) designs, (3) multiple-case (holistic) designs, and (4) multiple-case (embedded) designs.

Figure 27: Basic Types of Designs for Case Studies

	Single-Case Design	Multiple-Case Design
Holistic (single unit of analysis)	TYPE 1	TYPE 3
Embedded (multiple units of analysis)	TYPE 2	TYPE 4

(Source: Robert K. Yin, 1989 in “Case Study Research Design and Method”: 46)

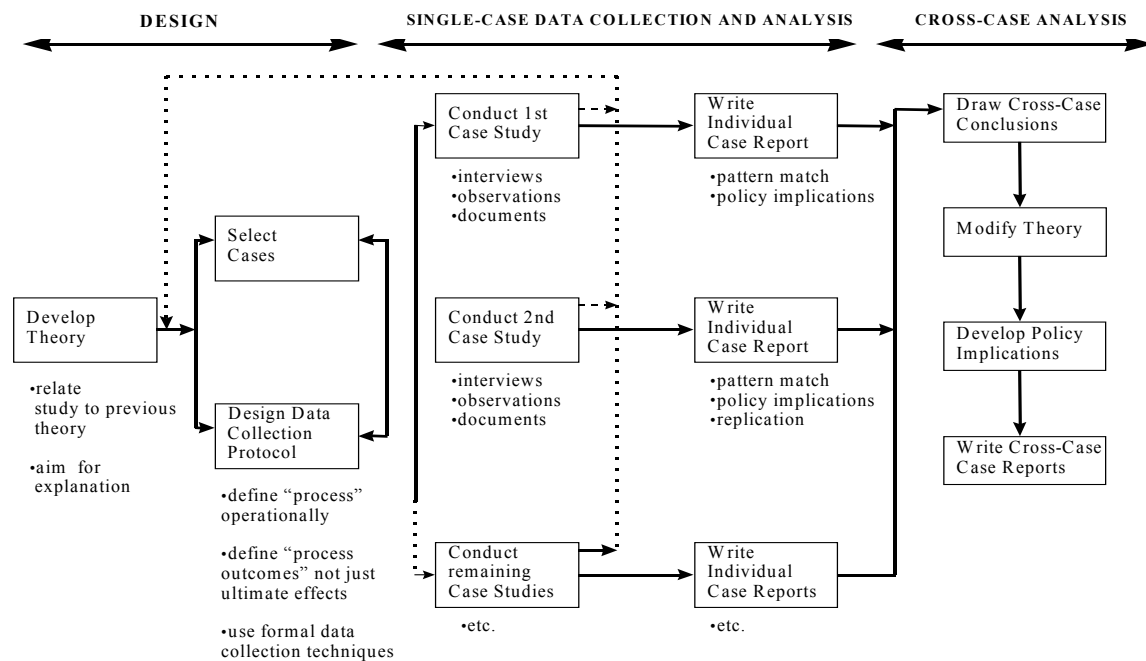
According to Yin (1989:46,50) the single-case design is an appropriate design under several circumstances. A single-case study is analogous to a single experiment, and many of the same conditions that justify a single experiment also justify a single-case study. Single cases are a common design for doing case studies. There are two types of single-case design: those using holistic design and those using embedded unites of analysis. Overall, the single case design is eminently justifiable under certain

conditions where the case represents a critical test of existing theory, the case is a rare or unique event, or the case serves a revelatory purpose.

However, the same study may contain more than a single case. When this occurs the study has to use a multiple-case design. Such designs have increased in frequency in recent years. A common example is a study of school innovations (such as open classrooms, teacher aides, or new technology) in which independent innovations occur at different sites. Thus each site might be the subject of an individual case study, and the study as a whole would have used a multiple-case design (Yin 1989:52)

The replication approach to multiple-case studies is illustrated in the Figure 28 below (Yin, Bateman and Moore, 1983). The Figure indicates that the initial step in designing the study must consist of theory development, and then shows that case selection and the definition of specific measures are important steps in the design and data collection process. Each individual case study consists of a “whole” study, in which convergent evidence is sought regarding the facts and conclusions for the case; each case’s conclusion are then considered to be information needing replication by other individual cases. Both the individual cases and multiple-case results can and should be the focus of a summary report.

Figure 28: Case Study Method



(Source: Robert K. Yin, 1989 in "Case Study Research Design and Method": 56)

Any use of multiple-case designs should follow a replication, not a sampling) logic, and the investigator must choose each case carefully. The cases should serve in a manner similar to multiple experiments- with similar results (a literal replication) or contrary results (a theoretical replication) predicted explicitly at the outset of the investigation Yin (1989:59).

3.3.2.2 A Multiple – Case Design

To study the research questions of this dissertation, as determined in section 1.2, requires a research design capable of examining different types of NW cases (e.g. internal, stable and dynamic NWs) and enterprises with different ownerships (SOEs, and private enterprises) as well as different levels of performances (e.g. successful versus failure). Therefore, to make cross case comparisons, a multiple-case design is more suitable than a single-case design. As Snow and Thomas (1993) pointed out: “comparative case studies provided the best vehicle for building an understanding of the complexity and richness of NW formation and development process.”

The unit of analysis is related to the fundamental problem of defining what the “case” really is – a problem that has plagued many investors at the outset of case studies. A “case” may be an “individual,” an “event,” or an “organization” (Yin 1989:31). As a general rule, the definition of the unit of analysis (and therefore of the case) is related to the way the initial research questions have been defined. The unit(s) of analysis in this dissertation was (were) the NW(s). In addition to multiple interviews with the actors who played brokers’ roles, other individuals involved in the building process of each targeted case provided confirmatory or new information. These individuals included stakeholders like NW members, parent firms or supervisors of the NW partners and government agents. A similar approach used by Snow and Thomas (1993) was applied where appropriate, and interviews were held with decision makers who were no longer with the institutions that formed the NW but who had been involved in the early stages of its development. These respondents offered insight into the history of the NW’s relationship.

The multiple case approaches require that data and theory be compared and contrasted throughout the data collection and analysis process (Isabella, 1990). “As constructs, perspectives, and relationships were identified, a model of the NW development process, and the role of the NW broker, gradually evolved” (Snow and Thomas 1993:222).

Finally, taking into consideration the common characteristics of the same NW type cases - and the dynamics of each individual case - the analyses were carried out by pair of cases and by individual case.

The coming section deals with the subject of identity of the empirical field (site section etc.)

3.3.2.3 Identity of the Empirical Field

Section 1.1 briefly updated China’s transitional economic process and it is followed by section 2.4.4.1, an overview of the business environment in China. In section 1.2, the agribusiness sector determined to be a general empirical field for this research. The current section introduces, along the level 3 question of Borum’s model (Figure 28), the specific industries in the empirical field. Given that the selected NW cases are playing supporting roles to the crop production, it is necessary to provide a short introduction to China’s agricultural development.

3.3.2.3.1 China Agriculture and Crop Production

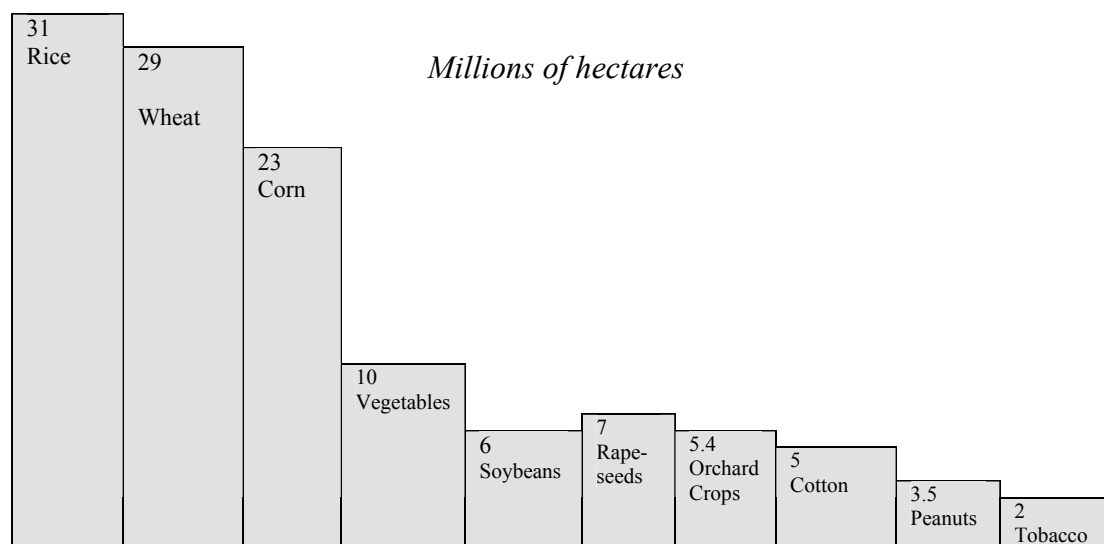
Agriculture includes industries of crop production, animal husbandry, fishery, and forestry. The selected industries in this dissertation are primarily linked with crop

production in China. Crop production refers to the farming activity of growing various crops which are consumed by humankind and animals mainly as food sources such as grain, fruits, vegetables and so on. **The agribusiness sector** covers a wide range of sub-sectors. In this dissertation the sub-sectors under study are the enterprises or institutions engaged in activities of research and development, production and distribution of agrochemicals, fertilizers, seeds and pollination, technical services which enhance productivity, and sustainable development of production of various crops.

Since 1978, in the agricultural sector, a reform started by introducing a system where a household contracts a piece of land from the government. In 1979, the government started to loosen the price control over agricultural production. Six years later, the government abandoned the 30-year-old state monopoly system of purchasing and marketing farm products. Farmers were allowed more freedom to decide what to grow and sell. The results of these efforts has been largely positive – agricultural output doubled in the 1980s and the country's gross domestic product GDP has more than tripled since 1978, standing roughly at around \$3.5 trillion - 19% of which (according to USDA) is generated by agriculture. In addition, great strides have been made to transform low-yielding farmland, improve monitoring and forecasting of natural disasters, and quicken the pace of developing agricultural chemicals. China accounts for 22% of the world's population but only 9% of the world's arable land. The rural population is about 800 million. State farms still account for about 5% to 8% of all operations (and about 10% of production, mostly in grain). Farmers frequently lack knowledge of new production technologies and over-apply crop inputs, endangering worker safety and contributing to water problems (Sulecki, 2002:12).

The country's crop, especially grain production, has experienced three stages of development in the past 20 years (Yang, 2001). Table 18 shows the top 10 crops in China.

Table 18: Top 10 Crops in China



(Source: Farm Chemicals International, China Special Country Report 1997:26)

The first stage is from 1980-1984; the gross output of grain in 1984 reached 407,300 million kg, - 1.23 times more than 1979. This is the first time China had achieved grain self-sufficiency since 1950s. The second stage is from 1985-1995. The grain output jumped over 450,000 million kg in 1990 and maintained this level until 1995.

The third stage started from 1996. The average annual output is over 480,000 million kg for five years. In the year 2000, in spite of severe drought and sharp reduction in sowing areas, the total grain production still reached the average level of production yield. Meanwhile, other crops such as cotton, oil crops, sugar crops, and fruits and vegetables have well satisfied the domestic demands.

The basic fact of the gross output increase of all crops is mainly due to **productivity enhancement**. In the past 20 years, despite an over 10 million hectare decrease of sowing area of grain crops, the gross grain output increased 1.6 times and the productivity increased 2.5 times. This is the result of **agricultural technology progress** with respect to seed improvement, cultivation practice, and soil and fertilizer management and crop protection (Yang, 2001).

Despite the success achieved in crop production, agriculture in China needs to address the following problems: 1) **oversupply of agricultural products**, surplus of grain and other agricultural products from 1996 to 2001. 2) **Low quality of many agricultural products**, including both nutritional and processing quality and safety or hygienic standards. 3) **Low income of farmers**, followed by continuous over production - since the price of most farm products has been on decline. 4) **Environmental degradation**, agricultural pollution resulted from the abuse of pesticides and chemical fertilizers in some areas which, in turn, affect the safety (holistic-health) of agricultural products. 5) **WTO accession** may impend the shrink of production of some traditional staple crops at certain periods (especially soybean and oranges) due to relatively high costs and inferior quality. China imported about 11 million tons of soybeans in 2000. The export value of China's agricultural products has been gradually declining in recent years. Additionally, the government faces challenges in its land administration system.

China's agriculture develops under the logic of three prerequisites: firstly, to produce enough products for the increasing population and national economic development; secondly, to comply with the market economic system in management and administration of agriculture; and finally to be in harmony with WTO principles. Therefore, **quality improvement and farmers' income are the two basic measurements** (Yang 2001).

3.3.2.3.2 The Agribusiness Sector

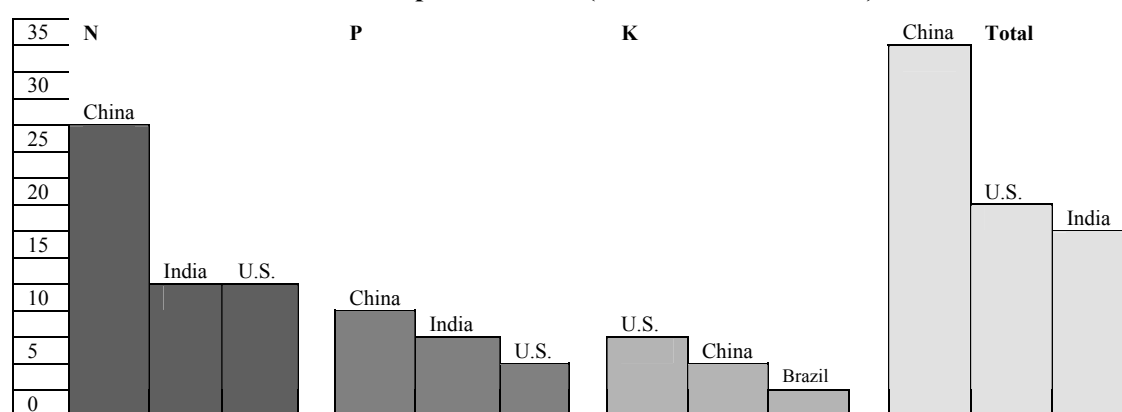
The proceeding section has defined the targeted industries in the agribusiness sector to be investigated in this dissertation. These are the enterprises or institutions that engage in activities of research and development, production and distribution of **crop agrochemicals, fertilizers, hybrid seeds and honeybee pollination services** which enhance productivity and sustainable development of production of various crops. Brief descriptions of each specific industry are presented in the following sections before introducing the selected NW cases.

3.3.2.3.2.1 Agrochemicals and Fertilizer Business

Fertilizer and pesticides are the major agricultural means of crop production, and both play a key role in securing steady agricultural growth. To illustrate, FAO carried out a series of experiments in 41 countries, for a period of 18 years, and gathered 410,000 pieces of statistical data. The result shows that 30% of total crop output stems from the application of fertilizers (Ma, 1999). According to statistics from MOA, the

average contribution rate of fertilizers to crop output measures at 40%. Field study shows 1 kg of fertilizer can increase paddy output by 9.3 kg, wheat by 9.6 kg, corn by 11.7 kg, Chinese sorghum by 8.7 kg, and grain by 8.6 kg. Consequently, Chinese government highlights the production and efficient supply of fertilizer. China is the second largest fertilizer producing country in the world while China's fertilizer consumption continues to be the largest. Because of the disproportion of China's fertilizer structure, a glut of nitrogen, and lack of phosphate and severe shortage of potash, annual fertilizer imports keep at a level of more than 10 million tons. Fertilizer import to China accounts for one-third of world's total fertilizer trade. Phosphate fertilizer imports account for 38% of world's overall phosphate fertilizer trade, while the import of potash fertilizer reaches 21% of the world total (the percentage differs because of different statistical perspective). In 1998, China spent 2.5 billion US dollars on purchasing fertilizers, making China the biggest buyer in the world market - further underscoring China's already significant position (Ma, 1999). Table 19 presents a list of the world's major fertilizer consumers.

Table 19: China NPK¹⁷ Consumption in 2000 (Million of metric tons)



(Source: (former) Ministry of Chemical Industry: China Pesticide Industry Association in Farm Chemicals International China Country Report 2001:14)

Topping the list of countries with globalized fertilizer supply, China is able to satisfy domestic demand of fertilizers for agricultural production. At the same time China makes a great contribution to the international fertilizer business and to the world fertilizer industry (Ma, 1999). As the top consumer of phosphate in the world, and the second largest market for potash (and while China is presently a net exporter of urea) China is also far and away the world's top consumer of nitrogen - using nearly twice as much product as each of the next two 'leading-consumers,' India and U.S.A. In the coming years China is expected to become a stable urea exporter and step up its shipments to foreign countries. However, operating under WTO will mean that larger, more technologically savvy producers will compete with overseas producers even as a "large shock" is sent to small and medium producers through nationalization and consolidation, according to one fertilizer analyst (Sulecki 2002:14). Importers see greater opportunity in China's lack of significant potash reserves. However, China has phosphate mines in its raw-material-rich western region - a targeted area of growth under the current Five Year Plan - and exports compound fertilizers, double super phosphate, and diammonium phosphate - mostly to Southeast Asia. Likely developments in China's immediate future are a large jump in production of compound NPK products, expansion and streamlining of fertilizer production

¹⁷ N= Nitrogen, P= Phosphate K= Potash

(particularly in nitrogen), start-up of several new phosphate projects, and an evolution in product mix and consumption as the country's domestic production shifts to more specialty, ornamental, and aquaculture crops (Sulecki 2002:14).

China has 250 to 300 producers of technical agrochemicals and more than 1,200 formulators - along with more than 1300 small to medium sized fertilizer plants. There are too many plants producing similar products in small batches to generate the needed return to properly maintain the facilities, let alone invest in new technologies. Smaller plants within provinces are grouping into loosely knit organizations to gain better access to capital, in some instances from foreign markets. Capital is seen as one of the most limiting factors. This has driven Chinese producers to expand export activities. In 1994, 61,300 tons of products were exported, according to the 1996 China Chemical Industry Yearbook. This was an increase of 43% over the previous year (Farm Chemicals International, 1997). With recent WTO accession, China is poised to spring into international trade. China's domestic agrochemical and fertilizer industries are modernizing, streamlining, privatizing, and hungering more than ever to secure export markets. Conversely, Chinese markets are opening to foreign crop inputs and agricultural commodities (Farm Chemicals International, 2002). Throughout the 1990s, China's domestic producers tripled the volume of product for export and quadrupled the value to about U.S. \$430 million in 2000. Plants have become more modern and environmentally sound, luring investment and joint ventures from foreign companies.

At the same time the central government's current Five Year Plan is attempting to rein in overproduction and oversupply in the Chinese market. Many of the national companies in the next five to ten years are expected to be whittled down through consolidation, general industry improvement, and government edict to about 500 - of which about 50 are expected to become "backbone" producers (Sulecki 2002:11,12). Some of the multinationals established a foothold in China a decade or two ago through joint ventures but have a combined market share of only 20%.

Given these conditions, adoption of new technology - along with a new market orientation and a focus on environmental protection - is a major subtext of China's current Five Year Plan. China offers a big market for foreign companies, but what the government really wants is to bring in new technology. Violation of intellectual property laws and the counterfeiting of agrochemical products is being dealt with more swiftly by authorities, but remains a major concern to some companies (Sulecki, 2002).

Wang Lu-Xian (2002), President of CNPA, summarized the progress made by the industry and its future challenges: China can now produce 250 pesticide varieties and more than 1,000 formulations. Steady improvement has been made in product quality, and a number of products with quality reaching the world advanced level have appeared, such as imidacloprid, detamethrin, carbendazim, tradimefon, glyphosate, and besulfuron. The research and development of pesticides is transitioning from imitation to innovation. Two pesticide innovation (engineering) centers, one in the north and one in the south, have been established in China. Insecticides, herbicides, and fungicides with independent intellectual property rights, such as the herbicide besulfuron-methyl and the fungicide SYP-L190, have been innovated.

Enterprise groups and listed companies with strong competitiveness - integrating science, industry, and trade - have emerged through reform, regrouping, and renovation. The production, circulation, and use of pesticides gradually have been standardized and legalized, and China has made resolute efforts in cracking down on the illegal acts of producing and selling fake and poor-quality pesticides.

Despite the outstanding developments in the agrochemicals industry, among 250 pesticide varieties, only about 10 have a large output, and most of them are traditional insecticides with relative high toxicity and resistance. A concept for the development of pesticide production during the Tenth Five-Year Plan period would adjust the output ratio to 65% insecticides, 10% fungicides, and 25% herbicides, and reduce the output of high-toxicity varieties by 50,000 to 100,000 tons. Efforts will be made to strengthen and improve the two national pesticide innovation centers and accelerate the development and innovation of new, high-effect varieties (including chemical and biological pesticides).

3.3.2.3.2.2 Hybrid Seeds Business

The seeds industry functions as a source of agriculture and represents agro technology growth. China's seeds industry has long been characterized by monopolized operation and consolidated supplies by state enterprises. The Chinese seeds industry has experienced three stages since the beginning of economic reform: 1) During the early 1980s, around 5,000 seeds farms and some 3,000 seed breeding units were set up, resulting in a great improvement of the seeds breeding technology in various regions with different climate conditions. The seeds business process, as other agriculture products were handled by several disjoint state organizations, were separately responsible for production and distribution. 2) Entered into the late 1990s, some 3000 State monopolized enterprises at different levels conducted seeds business operations that combined production, supply, and marketing activities. Their operations were also trans-regional. More seed breeding enterprises soon emerged. However, the industrialization of the country's seeds sector has not achieved much progress - mainly due to a lack of protection of intellectual property. 3) Since 2001, the State has enacted and implemented the Seeds Law and Protection Ordinances for New Plant Breeds. Thus, the seeds market has demonstrated a dynamic situation and an increasing competition between the seeds companies (China Farming Industry Net, Aug 31 2001). The seeds trade in the domestic market is about 20 billion Yuan, (\$2.5 billion) about 8% of the world figure or the second highest in the world with annual consumption of approximately 12.5 billion kilograms. At present, the demand for main crop seeds in China reaches 7 million tons annually, including the commercial type ones of 3.5 million tons; but these seeds, after being processed by grade selection and coating, only amount to less than 10%, demonstrating the low quality and prevailing wasting situations (Farm china.com, Aug 3, 2001).

In the meantime, according to the renowned agronomist on maize growing Li Denghai (2001), creativity and industrialization is the key to increasing the competitiveness of China's seed sector. Further, he has cited his own success as an example: "after China joins the WTO, foreign seed companies will roll in. However, many limitations imposed on Chinese seed companies would be removed at the same time ... China's seed industry will be able to compete with best seed companies in the world," he said. The target market is the US seeds market. "The seeds of the main crops produced in China, such as hybrid rice and hybrid maize, absolutely overpower those produced by foreign seed giants in terms of anti-disease quality and yield" (Xinhua, 2001).

Seeds scientists called for more legal action to prohibit infringements of intellectual property and regional protectionism - which are hindering the development of China's seed industry. China has signed a series of international treaties on the protection of new crop varieties, and the seed Law has been put into force, providing protection on

seed resources, breeding, production, and spreading high-quality seeds and trans-genetic plant seeds as well as importing major seeds from abroad. It serves as a solid legal basis for combating various illegal practices. Thus, improving the productivity of agriculture as well as accelerating the process of modernizing agriculture in China.

3.3.2.3.2.3 Pollination and Apiculture

Good pollination is essential to the production of many fruit crops such as apples, pears, cherries, and plums. Both yield and quality of the fruit depend on the intensity of pollination.

In its simplest sense, pollination involves the transfer of the male gamete - pollen - from the anther (part of the male structure of the flower) to the stigma - the receptive female structure of the flower. If the pollen is viable and compatible with the female tissue, it will produce a pollen tube that grows down into the ovary where fertilization of the ovule occurs, leading to the formation of a seed. This transfer of pollen from one part of a flower to another may be accomplished in several different ways, but in most orchard situations the primary agents of transfer are bees, especially honeybees. Good pollination, however, involves more than just the transfer of pollen from one flower to another. If pollination is to be successful, the pollen must be viable, the stigma must be receptive and there must be compatibility between the pollen and the female portions of the flower. If these conditions are not met satisfactorily or if pollen is not transferred between blossoms, little or no fruit will be set. Furthermore, insufficient pollen transfer can lead to poor fertilization of ovules, non-symmetrical fruit, and high rates of fruit drop. Many of these problems can be avoided by placing honeybee colonies in the orchard during the bloom period. The proper use and placement of honeybee colonies will help ensure maximum benefits. China has a long history of bee keeping. Since 1978, when China started her reform and opening policy, China's apiculture has developed rapidly. Both the number of bees kept and bee product output has ranked first in the world.

At present, China has about 6-7 million bee-colonies, with an annual output of about 256,000 tons of honey (FAO, 2001), more than 1000 tons of royal jelly, about 3000 tons of bee pollen, about 3000 tons of beeswax and about 300 tons of propolis. Other bee products also include bee toxin, bee pupa, bee larva, etc. China's beekeeping industry had achieved a direct economic benefit of about US\$ 2 billion per year estimated, on the basis of the purchasing prices in 1998. Compared with advanced bee-keeping countries, improvement is needed in China's bee-keeping industry, particularly large-scale production and product quality control. (China Livestock and Feedstuffs Status and Analysis Semimonthly Newsletter, June 15, 2000, Volume 3 Issue 11). Bee pollination in China is not a new technology. However, as an organized service business activity with scale operation is relatively new as presented in the Honeybee NW in section 3.3.2.3.3.

3.3.2.3.2.4 Distribution of Agribusiness Products

Across the country's 29 provinces are an estimated 30,000 distributors, 700,000 retailers, and 200 million farming households - all moving crop inputs over a developing transportation infrastructure and through a byzantine distribution system. There are seven major distribution channels now in China handling agricultural materials:

- CNAMPC - The China National Agricultural Means of Production Corp - primarily at the provincial level and in major cities
- AMPC - Agricultural Means of Production Corp.– outlets at provincial, city, and township level
- PPS – Plant Protection Stations, focusing on more sophisticated products
- Green food - focuses on ‘softer’ chemicals, mainly for vegetables
- Extension System – close to farmers; now handling fertilizer
- State Farms – collective farms serving food production and political functions
- Private Distributors – growing in number; some are PPS with private licenses

CNAMPC has, for 40 years, dominated the distribution chain for fertilizers, pesticides, plastic sheeting, and other agricultural materials. CNAMP’s network sprawls over 21 provinces and 2,000 counties. As the wholesale supplier, CNAMPC reaches over 50,000 grassroots-level supply stations. The dominant retail segment of the distribution channel are the AMPCs, retail outlets supplying farmers with agricultural inputs as well as a variety of other needs. The CNAMPCs in each province are loosely networked with AMPC’s operations at the provincial, regional, and county levels. Below the county level, retail selling is the province of the Commercial Bureau found in each city or village. The Commercial Bureau stores carry all types of merchandise in addition to agrochemicals, fertilizers, and plastic sheeting. To serve the cooperatives and the AMPC networks in each province, CNAMPC has 7 wholly owned subsidiaries, 28 offices, and 12 warehouses – 5 for agrochemicals and 7 for fertilizers. In addition, CNAMPC owns 80,000 square meters of open storage area, 5 railway sidings, and a pier, which can accommodate 10,000-ton vessels.

Until the move to a market based economy, CNAMPC was the sole national corporation specializing in the business of fertilizer, pesticides, plastic sheeting, and other agricultural inputs. With its sprawling network of warehouses, CNAMPC was by far the major supplier to retailers, with CNAMPC units located at regional and provincial levels. Its only competitors were state owned fertilizer and agrochemical companies who marketed directly to retailers within their province.

CNAMPC is mandated by the government to maintain adequate reserves of pesticides to avoid a natural disaster. CNAMPC has built 17 bulk blending fertilizer plants with its own investment and has three bulk fertilizer bagging plants. Fertilizers are purchased from local plants and imported. CNAMPC has established relations with more than 40 overseas agrochemical manufacturers.

Although the AMPCs handle both agrochemicals and fertilizers, when discussing distribution, fertilizers and agrochemicals must be considered separately. As stated earlier, CNAMPC deals some 20 million tons of fertilizer annually (CNAMPC annual report 1995). With the development of the economic reform in China, CNAMPC’s dominance in agrochemical distribution is being challenged by many agrochemical marketers who are bypassing CNAMPC and going directly to the AMPC and PPSs. AMPCs also found themselves being courted by import/export companies, by domestic producers now free to sell outside their province, and by joint venture companies whose multinational partners are used to dealing with all levels of distribution channels and are bringing new approaches to China’s marketplace.

In the agrochemical business, capital ultimately determines how products are marketed. There is a shortage of bank loans to finance working capital, which means the distributor must be “cash rich” to do a proper marketing job. If a company overstocks at the end of these seasons it may not be able to pay the supplier until the following year. The need to finance product in the distribution pipeline had pushed

companies to continue to use CNAMPC and provincial AMPCs (Farm Chemicals International, 1997).

Since 1999, although the government broke CNAMPC's monopoly, it remains a main player – accounting for 40% of chemical distribution. However, its relative strength now varies among its branches at the provincial, city, and township levels. Two branches that actively represent multinational companies are AMPC Shanghai and AMPC Guangzhou. Other 'spin-off' AMPC locations tend to be privatized at the provincial and local level and frequently operate in the same market as CNAMPC (Sulecki, 2002). In fertilizer, two channels supplemental to CNAMPC have emerged, (both as manufacturers) and the MOA extension system sells fertilizer directly to farmers. The MOA also operates Plant Protection Stations (PPS), which promote more sophisticated agrochemical products - creating a new extension of PPS called Green food, which promotes "softer" chemicals to mostly vegetable producers.

State farms – large collective operations, especially in the country's far northeast and far northwest, have their own system of consumption of agricultural materials. Finally, private distributors of all shades - some of them PPS outlets with private licenses - are growing in number and are hungry for collaborators. Frequently, their sales force is more aggressive and can cover more territory than AMPC and PPS. According to Sulecki (2002) some observers speculate that a U.S. style distribution system of farm management may eventually take root. Nevertheless, other factors may likely make distribution difficult. Transportation in rural areas is still behind standards. Many suppliers are unprofessional and offer little service. Most growers have limited access to new agro production technologies. Moreover, statistics on crop input usages are minimal at the national level. However, there is widespread agreement that with decentralization and privatization well underway, distribution in China has made giant leaps in only a handful years (Farm Chemicals International, 2002:16,18).

The above sections have provided an overview on the selected industries in the agribusiness sector of this research. The reasons for selecting the sub-sectors described as the research targets in this dissertation is mainly because the cases selected have satisfied the selection criteria set in the coming section. Agrochemicals, fertilizer and hybrid seeds are the main technical inputs for the crop production and the selected NW cases include manufacturers of traditional agrochemicals and fertilizer and new biotechnological solutions which are representative to the major industrial groups supporting the country's agriculture development. In addition, the transitional context of the research questions were taken into consideration for having more and different types of actor groups to be investigated on their strategic conduct in forming NW alliances, and the outcomes of these NWs, with respect to the particular attributions to each actor group, in the present transitional economic process.

Having introduced the selected fields in the agribusiness sector, the focus moves to the introduction of the target cases investigated in these industries.

3.3.2.3.3 Target Cases

In order to obtain a set of suitable cases which have the most topical relevancies to the phenomenon /variable being studied, the following eight case selection criteria were set and followed during the execution of the case searching process:

1. A NW cooperative arrangement consists of more than two partners

2. NWs formed during the period from 1990 to date, to increase the environmental comparability between cases
3. NW cases represented by diversified ownership participants of SOEs, private enterprises and Government actors
4. NW cases involved in different activities within the Agribusiness sector (e.g. manufacturing, distribution, research, administrative etc.)
5. NW cases represented by both traditional business in mature market and new technology based business in growth market
6. NW cases with characteristics and operational logic identical to the NW typology used in the dissertation (internal, stable and dynamic NWs)
7. NW cases with different level of performances (success and failure), and
8. Acceptance of interviews with five top managerial position holders representing key stakeholders in a NW (including the broker)

A total of 14 cases were processed during the case searching period, consisting of two trips in China (March-April and June-July 2001). However, most of the initially obtained cases were dropped after evaluation mainly because these cooperative arrangements were in the forms of equity share joint ventures and most of them were between two partners, or multi subsidiaries, vertically structured within one conglomerate. Consequently, six research sites were selected from four different types of businesses located in the three different regions in China. Among them, three were in Shanghai, (one agrochemical business and two chemical fertilizer business) two were in Beijing (one seeds business and one honeybee pollination service business) and finally, one research site was in Shanxi (Bio-fertilizer business).

In order to allow the readers to easily follow the names of the NW cases and the many actors throughout the dissertation process, each NW and actor was given a name with memory effect in accordance with the business nature of the NW (e.g. the Hybrid seeds NW), and the roles of the actor played in the NW (e.g. the Seeds broker). This system is applied throughout the dissertation and included the informants' responses as well.

To facilitate the process and comparisons among the cases, the following part of this section presents a one-page description of each of the six NW cases designed along a standard scheme in Tables 20-25, while Table 26 sums up the main characteristics of the six cases. More exhaustive descriptions of the six NW cases are attached in Appendix I.

Finally, Table 27 presents a summary of the performance of each NW to allow readers gain a preview in interpreting other results of Chapter 4. A detailed analysis of the NW groups' results and performance will be presented in section 4.9 of chapter 4.

Table 20: Summary of Case 1: The Hybrid Seeds NW

The actors interviewed in the NW	The Seeds broker	The Parent Seeds Producer	The Seeds Reproducer	The Seeds distributor
	The Hybrid Wheat Research Center of Beijing Academy of Agricultural and Forestry Science	The General Cooperation of Agriculture, Industry and Commerce of Gao liYin town	The Science and Technology Commission of Funan County Government	The Seeds Company of Baodi County, Tianjin
Original activities	Research of hybrid wheat seeds	-Distribution of agricultural means and products -Agricultural science/technology extension	Rural agricultural science and technology extension, administration	Distribution of various crop seeds to the local crop production industry
Historic background	In December 1996, the Seeds broker had developed a cutting edge technology in production of hybrid wheat seeds which can benefit growers in gaining an additional yield of 15- 20% of wheat production without putting any other additional technical inputs. After obtaining a patent protection, the Seeds broker started to embark on a journey of commercializing the hybrid wheat seeds on its own endeavour. After three years, the Seeds broker realized that it was not a good idea to manage the field operation by himself due to requirements of many basic farming expertises, and in particular, the capabilities of organizing and managing many individual farmers. Experience showed that these were not strengths but high cost, high risk, and low efficiency activities for the Seeds broker. It was decided that by entrusting local partners with governmental influence, taking care of the field operation while keeping the core technology of the parent seeds production in the Seeds broker's own bases, thus it turned out to be a better arrangement than the Seeds broker doing everything by himself.			
NW Formation	Initiated by the Seeds broker, three other separately located organizations (the Parent seeds producer, the Seeds reproducer and the Seeds distributor) joined the NW cooperation with a relative loosely coupled cooperative relationship. Led by the broker, the NW effectively conducted four basic sets of activities (see below) based on each of their own competence, in a large-scale operation over long geographic distance between each partner's operational sites.			
Activities of each actor in the NW	Technical supervising /coordination -Providing technical instructions and support to the NW partners -Coordinating operations between the NW partners -Broker roles (see section 4.7.3.1.1)	Parent seeds production -Organizing -Training -Monitoring -Quality control -Collecting -Delivering	Hybridizing and reproduction seeds -Organizing -Training -Monitoring -Quality control -Collecting -Delivering	Seeds distribution -Purchasing -Organizing field demonstration -Training -Distributing seeds
Results	As a result, in addition to other fulfillments associated with the cooperation, all parties achieved satisfactory economic gains. The broker, the NW partners, and the other stakeholders were all satisfied with the benefits obtained from this loosely coupled, but closely coordinated cooperation.			
Future development	While the NW continues to develop, the partners were also concerned about the future development of the business in relation to the management capabilities. The Seeds broker has an ambitious vision of expanding the new hybrid seeds business to the international market and was clearly aware of the facts that the business has arrived at a crucial stage for his future development which, will depend largely on how the Seeds broker organizes the business activities.			
NW properties	According to Miles and Snow (1994) the characteristics of a dynamic NW were that business required firms to outsource extensively, and that numerous firms (or units of firms) operating at each point along the value chain, each ready to be pulled together for a given product or venture and then disassemble to become part of another strategic alliance. In such circumstances, the lead firms identify and assemble assets owned by others. Lead firms themselves typically rely on only a limited set of core competences.			
NW classification	The Hybrid Seeds NW emerged in settings where new and high market potential business required competence of managing large-scale field operation and investments in costly, special-purpose assets were risky. A dynamic NW model enabled Hybrid Seeds NW holding only those assets (technology) that they could employ fully and flexibly by focusing on a portion of the value chain and to forge relationships with other specialist partners to offer the final product and service. Besides this, the operational logic of this case also presented itself close to the description of partner-firm independence coupled with the lead firm's overall vision (Miles and Snow, 1994). Therefore, the Hybrid Seeds NW was classified as a Dynamic network.			

Table 21: Summary of Case 2: The Honeybee NW

The actors interviewed in the NW	The Bee broker	The Vegetable Researcher	The Beekeepers Association	The Science Administrator	The Township Administrator
	YunAnXin Bio-pollination Company of Beijing Academy of Agricultural and Forestry Science	The Vegetable Research Center of Beijing Academy of Agricultural and Forestry Science	Jin Hua Apiculture Association	The Association of Science of Pinggu County	Yangzhen Service Station of Vegetable Production and Supply
Original activities	Research of apiculture technology	Research of vegetable growing technology	Policy lobbying, coordinating technical/commercial activities for the individual apiculturists	Rural agricultural science and technology extension	Rural agricultural science/technology extension Vegetable production/ supply
Historic background	The substantial application of pesticides has reduced the population of natural insects, thus resulting in inefficient pollination on various plantations which has led to further poor production of crops. Farmers have to employ additional workforce to conduct pollination manually. The labor-intensive practice caused high costs and poor performance and farming businesses were adversely affected. In 1999, the Bee broker responded to this market need by commercializing his technology and facilities of honeybee pollination - an efficient way of improving productivity and quality of the crops in an environment friendly way. The Bee broker targeted high valued fruits and vegetables markets around Beijing. The business was loaned to carry out a series of activities from providing pollination service, conducting honeybee R&D projects, to the distribution of honeybee related nutritious products and green food products. However, technology alone was not enough to run the business as it required other important resources, and competences which the Bee broker did not possess - such as large source of honeybees and capabilities of organizing and coordinating scale field operations.				
NW Formation	The Bee broker expanded his existing alliance to a NW of three independent private and government partners with whom the Bee broker had had good previous cooperation and relations between organizations and individuals. Consequently, initiated by the Bee broker, a NW was formed consisting of four participants – the Bee broker himself, the beekeepers association, the science administrator and the township administrator. The NW has since operated pollination service business by combining the NW participants' resources and competences.				
Activities of each actor in the NW	Technical supervising /coordination and support to the NW technicians -Broker roles (see section 4.7.3.1.1)	Vegetable pollination application -Organizing farmers field trials -Training -Monitoring	Material supply operation -Preparing -Transporting, arranging bee swarms	Field coordination -Organizing farmers field trials -Training -Monitoring -Fee collecting in Pinggu County	Field coordination -Organizing farmers field trials -Training -Monitoring -Fee collecting in Yangzhen town
Results	The NW cooperation has achieved successful results. The broker and NW partners were all happy about the cooperative arrangement in that each of their objectives was in a process of reaching its goal.				
Future development	Each partner believed that his own role was important to the success of the cooperation, but appreciated the other partners' indispensable roles too. The local partners wished to develop a stable and long term cooperative relationship with the Bee broker. However, they were also of the opinion that ,in the long run, a larger scale business operation would be better managed by a professional business organization with technical and commercial resources rather than their present arrangement.				
NW properties	According to Miles and Snow (1994) the characteristics of a dynamic NW were that a business required firms to outsource extensively with numerous firms (or units of firms) operating at each point along the value chain each ready to be polled together for a given product or venture and then disassemble to become part of another strategic alliance. In such circumstances, the lead firms identify and assemble assets owned by others. Lead firms themselves typically rely on only a limited set of core competences.				
NW Classification	The Honeybee NW emerged in settings where new and high market potential business required competence of managing large-scale field operation. And investments in costly, special-purpose assets were risky. A dynamic NW model enabled the Bee broker holding only those assets (technology) that they could employ fully and flexibly by focusing on a portion of the value chain and forging relationships with other specialist partners to offer the final product and service. Besides, the operational logic of this case also presented itself close to the description of partner-firm independence coupled with the lead firm's overall vision (Miles and Snow, 1994). Therefore, this case was classified as a Dynamic network.				

Table 22: Summary of Case 3: The Compound Fertilizer NW

The actors interviewed in the NW	The SODE broker	The Agro-tech center	The Agro-researcher	The Chemical engineer	The Fertilizer Producer
	Shanghai Agricultural Means of Production Corp. (SAMPC)	Shanghai Agricultural Technology Extension/Service Center	The Ecological Science Research Dept of Shanghai Research Institute of Agricultural Science	The Phosphate Compound Fertilizer Center of Shanghai Research Institute of Chemical Industry (PCFC)	Taiwan Qing Shang Chemical (CHINA) Investment Co., Ltd (QSC)
Original activities	Distribution of agrochemicals, fertilizers and other agricultural means and materials	Rural agricultural science and technology extension and administration	Research /develop new compound fertilizer, leaf surface nutrient liquid, agricultural ecology, and green technology etc.	Research/ develop process technology /complete set engineering project of phosphate fertilizer	Manufacturing and distribution of nutrients-sulphate of potash (SOP)
Historic background	China's economic reform fostered an increased pressure of competition in the country's agrochemical market. Manufacturers and other agrochemical players who have gained right of direct access to retailers and users have challenged the former superior monopoly status of the SODE broker in the agribusiness sector. To react to this change, one of the new strategies used by the SODE broker was to ensure new and stable sources of supply by investing in a special, mixed compound fertilizer plant in Shanghai. The core competences of the SODE broker were marketing and distributing agricultural products in the rural market. Other important expertise was needed for the success of the strategy. Consequently, the SODE broker has initiated formation of a cooperative organization with four other independent organizations with possession of needed resources.				
NW Formation	During the formation process, the SODE broker and partners the Agro-tech center, the Agro-researcher, the Chemical engineer and the Fertilizer producer – encountered some difficulties, which however, did not prevent the partners from further pursuing the objective. As a result of the partners' willingness of cooperation and their valuable contribution, a multi-partner cooperative arrangement coupled with both tight and loose relationships - the Compound fertilizer NW was successfully established..				
Activities of each actor in the NW	Strategic management of the NW operation -Distribution of fertilizers -Broker roles (see section 4.7.3.1.2)	Product technical promotion -Customer training	Product development	-Production process design, installation and improvement -Quality control	Manufacturing of mixed compound fertilizers
Results	The new company is in the process of implementation as planned. All partners involved appreciated the interdependency relationship linked by the complementary value adding roles played by each partner. A clear confidence towards the future of the Compound fertilizer NW is reflected from the facts that all parties remain with their optimistic view of the market potential of their product and the continued good relationship among the five partners at both company and individual levels which exists.				
Future development	The NW still operated at a relatively early stage of the development phase, with further developments ongoing. Whether the parties could still maintain their harmony during the formation phase in the new developmental stage, and how factors such as cultural differences between each partner with different professional backgrounds and management styles could impact their cooperation are still yet to be seen.				
NW properties	According to Miles and Snow (1994) the characteristics of stable NWs were that several firms own assets but were still dedicated to a particular business; the assets of vendors nested around a large core firm either providing inputs to the firm or distributing its outputs and used partial outsourcing in a relatively predictable competitive environment.				
NW Classification	The actors in this case operated in a mature industry with relatively predictable market cycles and demands. Stable NWs formed around the key firms for which NW partners contributed both upstream and downstream services (technical support, production and promotion). The partners interacted regularly and their relationships were limited and predictable. The operational logic was a centrally coordinated specialization (Miles and Snow, 1994). Therefore, the Compound fertilizer NW was classified as a Stable network .				

Table 23: Summary of Case 4: The Biofertilizer NW

The actors interviewed in the NW	The POE broker	The Science bureau	The Biofertilizer distributor	The Pomology Researcher
	Shanxi Zhonghe Biofertilizer Limited (ZHB)	The Science and Technology Bureau (STBY)-a department of the Yichuan County government.	Yichuan Science and Technology Service Center (STSC) - a privately owned firm	Shanxi Pomology Research Institute
Original activities	Manufacturing and marketing biological bacteria fertilizer	Rural agricultural science and technology extension and administration	Distribution of agrochemicals, fertilizers and agricultural equipment	Research /develop Pomology science
Historic background	The POE broker has targeted apple trees market in the Yichuan County, 300 km away from Xian city for his biological bacteria fertilizer, which was produced with biotechnology of nitrogen fixation. The POE broker located far away from the market whereby the customers – farmers living in dispersed villages with difficult communication and overall less developed infrastructure. The POE broker, like other small firms, had difficulties in marketing their products due to limited resources. But pressured by the increasingly severe competition and market stagnation in the nearby areas, new markets have to be developed and cooperation with influential local partners was believed to be the only way out for the business to be developed.			
NW Formation	The POE broker started to establish his ties first with the local Governmental department – the Science bureau by supporting its science and technology promotion activity. The success of the initial cooperation and a good personal relationship build-up has led to a further enclosure of the biofertilizer distributor in Yichuan County. A cooperative model of “Supplier + Government + Distributor + Farmers” in marketing biofertilizer business in the Yichuan County was formed according to each partner’s competence and their complementary interests.			
Activities of each actor in the NW	Strategic management of the NW operation – manufacturing biological bacteria fertilizer Technical advising on product application -Broker roles (see section 4.7.3.1.2)	Field coordination -Organizing farmers field trials and facilitating promotion activities -Farmer training	-Distribution of the biofertilizer in Yichuan County -Co promotion of product	Technical promotion, Farmers training
Results	As a result of effective joint operation by the NW partners, recognition of the product was rapidly gained from the farmers and sales were generated. The POE broker became the first supplier of biofertilizer to successfully enter the Yichuan market in a relatively short period. The POE broker, satisfied with the beginning of its operation, appreciated the roles played by the local NW partners in the present cooperation. The partners all felt that there existed a good communication and friendship among them.			
Future development	While continuing to consolidate the Yichuan market, the POE broker prepared to expand similar operations in the nearby counties where the other two partners have contacts. Cooperation continuing to develop, the Biofertilizer distributor also expressed concerns over the long-term securing arrangement of the cooperative relationship with the broker, and asked that a relatively tightly coupled cooperative relationship to be arranged between the partners. With the business gradually stable in a foreseeable environment of Yichuan county, the cooperative arrangement of the NW relationship is in the process of changing			
NW properties	According to Miles and Snow (1994) the characteristics of stable NWs were that several firms own assets but stay dedicated to a particular business; the assets of vendors nested around a large core firm either providing inputs to the firm or distributing its outputs and used partial outsourcing in a relatively predictable competitive environment.			
NW Classification	The actors in this case operated in a mature industry with relative predicable market cycles and demands. Stable NWs formed around the key firm for which NW partners contributed both upstream and downstream services (administrative support in product promotion, product distribution and after sales service). The partners interacted regularly and their relationships were limited and predicable. The operational logic was a centrally coordinated specialization (Miles and Snow, 1994). Consequently, the Biofertilizer NW was classified as a Stable network.			

Table 24: Summary of Case 5: The Ammonia Fertilizer NW

The actors interviewed in the NW	The SOIE broker	The Marketing center	The Fertilizer Producer (A)	The Fertilizer Producer (B)	The Fertilizer Distributor
	Shanghai ZhongYuan Chemical Co., Limited (ZYCC)	Shanghai ZhongYuan Fertilizer Marketing Company	Qingpu Chemical Company	Fengxian Chemical Plant	Shanghai Agricultural Means of Production Corp. (SAMPC)
Original activities	Strategic management of the ZYCC group operation	Newly created NW.	Manufacturing and distribution of ammonia fertilizers	Manufacturing and distribution of ammonia fertilizers	Distribution of agrochemicals, fertilizers and other agricultural means and materials
Historic background	The abolishment of the central planning purchase and supply system in China has brought both opportunities and challenges to the fertilizer business. In order to survive in an oversupplied market environment, the six plants of the SOIE broker producing out of dated synthetic ammonia have engaged in chaotic competition of severe pricing war and dumping activities among themselves. The SOIE broker has restructured his assets with an objective of optimizing resources and developing new technologies/products and conducted a transformation process for his six synthetic ammonia fertilizer plants with low economic performance and grim future prospects.				
NW Formation	In 1999, the SOIE broker formed a Marketing center structured with shares and board representations from the six fertilizer plants. The objective of the new company was to create a unified supply position in the region, to stop the disorderly competition among the members by coordinating their activities into a cooperation of resource sharing and providing assistance to their business operation. The members could sell their products through the Marketing center and directly to the market under a coordinated scheme. The general manager and his team have made efforts in coordinating business arrangements with the key distributor externally and strengthening the member's operational capabilities internally. The operation was successfully carried out at the beginning stage with some tangible results achieved.				
Activities of each actor in the NW	Strategic management of the SOIE broker's group operation -Broker roles (see section 4.7.3.1.3)	-Marketing service -Training -Coordination of sales, production, purchasing -Direct sales	Manufacturing and distribution of ammonia fertilizers	Manufacturing and distribution of ammonia fertilizers	Distribution of agrochemicals, fertilizers and other agricultural means and materials
Results	Under a situation of continual oversupply in the local fertilizer market, shortage of financial resource, and the traditional SOE system problems, members of the Marketing center were found increasingly breaching rules and reengaging in competitive activities. The GM of the Marketing center tried extremely hard to get the members operating in a congruent manner. The over-all performance was low, and even now the ammonia NW continues to fight for survival.				
Future development	New initiatives of structural reforms by the SOIE broker were to be implemented to a direction of diversity of ownership.				
NW properties	According to Miles and Snow (1994) Internal NWs emerge inside large organizations as resource flows become increasingly unpredictable or costly. The primary application of the internal NW is in mature industries requiring large capital investments. Market-priced exchanges allow performances appraisal of internal units.				
NW Classification	The actors in this case were in a mature industry. The SOIE broker owned all of the assets associated with the business. The purpose of setting up the Ammonia fertilizer NW was to gain a competitive advantage through shared utilization of assets and building up a stronger market position in distribution and purchase. The formation of the NW was to apply a unified standard and there was an internal market mechanism in product sales arrangement. According to Miles and Snow (1994) the operational logic of the internal NW was commonly owned business elements allocated along the value chain using market mechanism. The organizational form of the Ammonia Fertilizer NW was thus classified as an Internal network .				

Table 25: Summary of Case 6: The Agrochemicals NW

The actors interviewed in the NW	The State broker	The Insecticide producer	The Herbicide producer	The Fungicide producer	The Pesticide researcher
	The Ministry of Chemical Industry (MCI) / Shanghai Bureau of Chemical Industry (the State broker)	Shanghai Pesticide Factory	Shanghai Union Chemical Factory	Shanghai Dongfeng Pesticide Factory	Shanghai Pesticide Research Institute
Original activities	Strategic policy making and administration of the national /local Chemical industry	Manufacturing and distribution of organic phosphate based insecticides	Manufacturing and distribution of herbicides	Manufacturing and distribution of fungicides	Research on pesticides technology
Historic background	During early 90s, the Ministry of Chemical Industry (MCI) of China initiated a strategic restructuring of the state agrochemical industry. The strategy included building up of two national centers of pesticide chemical synthesis in North and South China. The Shanghai Bureau of Chemical Industry (the State broker) was given the task of establishing the South center in the form of an industrial enterprise setup. The authorities from the central to the provincial levels all provided strong supports to the project.				
NW Formation	MCI and Shanghai Bureau of Chemical Industry (the State broker) have formed an agrochemical conglomerate — the Asian Pacific Agricultural Chemical Group (the Agrochemicals NW) - by integrating three state owned agrochemical manufacturers and one pesticides research institute in Shanghai. The State broker appointed the former directors of the four units (shareholders) as members of the group management team. Group units were expected not only to deal with the outside market but also to operate among the members internally (toll production, transfer technology etc.). The formation of the group was smooth and rapid because of strong governmental support.				
Activities of each actor in the NW	Strategic policy making and administration of the national /local Chemical industry -Broker roles (see section 4.7.3.1.3)	Production and distribution of pesticide (insecticide)	Formulation and distribution of pesticide (herbicide)	Production and distribution of pesticide (fungicide)	Research of pesticides technology
Results	Soon after the Agrochemicals NW had entered into the operational phase, many hidden problems were unveiled. The mistrusted relationships between the core management team members led to increased non-cooperative behavior amongst the partners, and the company rules and regulations were rendered useless. The State broker became less enthusiastic about the Agrochemicals NW since a long pursued fund was no longer available due to a change of decision by the central authority. With a situation that no partner in the management team respected the authority of the group worsened, abetted by a depressed market condition for the agrochemical industry in 1995. The Agrochemicals NW had to resume each partner to the status before its formation. The key managers eventually left the group. In 1996, the Agrochemicals NW was then taken over by another Shanghai based Chemical conglomerate.				
Future development	---				
NW properties	According to Miles and Snow (1994) Internal NWs emerge inside large organizations as resource flows become increasingly unpredictable or costly. The primary application of the internal NW is in mature industries requiring large capital investments. Market-priced exchanges allow performances appraisal of internal units.				
NW Classification	The actors in this case were in a mature industry. The industrial administrator owned all of the assets associated with the business. The purpose of the setting up the agrochemicals NW was to gain competitive advantage through shared utilization of assets as well as continuing development and exchange of managerial and technical know how. The formation of the new group was to apply a unified standard and there was an internal market mechanism in specific toll production arrangement and technology transferring. According to Miles and Snow (1994) the operational logic of internal NW was commonly owned business elements allocate along the value chain using market mechanism. The organizational form of the Agrochemicals NW was thus classified as an Internal network .				

Having presented short descriptions of each case, Table 26 below sums up the six NW cases according to their main characteristics.

Table 26: The Main Characteristics of Each Pair of NW in a 2 x 2 X 2 Multiple Case Study Format

Selected cases	Hybrid Seeds NW Case	Honeybee NW Case	Mixed-compound Fertilizer NW Case	Bio-fertilizer NW Case	Agrochemicals NW Case	Ammonia Fertilizer NW Case
NW types	Dynamic NWs		Stable NWs		Internal NWs	
Industry	Research in Hybrid seed and apiculture		Chemical Fertilizer and Bio-fertilizer		Agrochemicals/ Fertilizer	
Brokers	Research institutions		Distributor /supplier		State industrial agents	
NW participants are in possess of	Different resources		Different resources		Similar resources	
Partners ownership	Different ownership system (SOE + Non SOEs + State agents)		Different ownership system (SOEs + Non SOEs + State agents)		Same ownership system (SOEs + SOEs)	
Business /market	New and growth business/ market potential		Mature industry/ predicable market		Mature industry/ predicable market	
Activities combined in the NW	Complementarity (research + production + State agents)		Complementarity (research + production + distributor + State agents)		Similarity (productions + productions)	
NW formation initiated by	Market		Market		Government	
Relationship between the partners	Loosely coupled relations		Tightly and loosely coupled relations		Tightly coupled relations	
Technology content level	*New		Medium		Outdated	
Performance	Successful		Successful start up		Unsuccessful	

* Honeybee pollination is not a new technology, but in the Honeybee NW case, the method has not been used so far in the area

Section 1.5 indicated that the performance of each NW would be treated in section 4.9 of chapter 4. Nevertheless, for the convenience of interpreting other results of chapter 4 and in the light of the performance of the NWs, a summary of the comparative results of each NW are presented in Table 27 below. The longitudinal performance measures for the six NWs calculated by a seven-point Likert scale were based on data collected through questions 55 (member), 57 (broker) and 59 (stakeholder).

Table 27: Comparative results and performances in the NW Groups

To what extent have each of the following performance objectives of the alliance organization been met?		DNWs		SNWs		INWs	
		The Hybrid seeds NW	The Honeybee NW	The Compound fertilizer NW	The Biofertilizer NW	The Agrochemicals NW	The Ammonia NW
1	Profitability	6	5.25	na*	5.25	1.6	1.75
2	Net profit for the coming year	6.25	5.5	Na	6	2.2	2
3	Growth	6.5	6.5	Na	5.75	2.6	2.75
4	Market share	6.25	4	Na	5	2.4	3.25
5	Prestige or positive attitude of cooperative partners/members	6.25	7	6	7	2.4	4
6	Innovation	6.75	7	6.2	5	1.8	4.75
7	Appreciation from the local government or the community	6.75	6.75	5.4	6	1.8	4.5
8	Social responsibility (other goals)	6.5	7	6	6.25	2	4
Overall performance		6.4	6.1	5.9	5.7	2.1	3.3

Note: All scores are averages based on a scale of 1 = very low to 7 = very high. Samples size = 26

*Unaccounted for the Compound fertilizer NW's uncompleted construction of production site.

3.3.2.3.4 Unit of Analysis

As defined in section 3.3.2.2.2, the unit of analysis of this dissertation is the NW. This study has explored the relationship between process and performance in the NW form of organization - with a special focus on how brokers manage the process of formation and development (Snow and Thomas 1993).

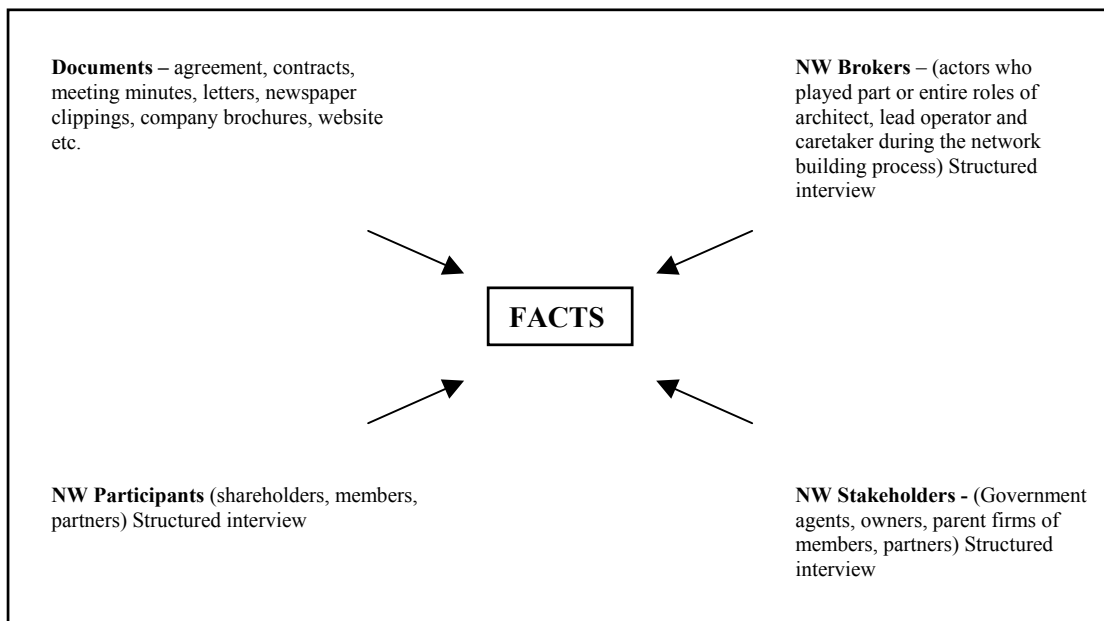
Multiple interviews were carried out with the six lead brokers in the NWs, the key managers of stakeholders' organizations, and important individuals involved in the creation and development of each NW (e.g., Chairmen, Directors, CEOs, General Managers, and company owners). In addition interviews were also held with decision makers who were no longer with the institutions that formed the NW, but who had been involved in the early stages of its development, to obtain insight into the history of the NW's relationships.

3.3.2.3.5 Data Collection Process

The data collection process of this research was executed during March-April and June-August 2001. The process started by approaching some personal and business contacts of the researcher in the targeted industries at central administrative bureaus in Beijing and Shanghai in order to obtain their support in searching for suitable cases. Considerable time was spent on explaining the particular requirements of case selection criteria. It was important to distinguish between JVs and contractual cooperative enterprises - which are more formal cooperative arrangements between enterprises, and normally with two partners. As presented in the above section, six cases were identified in due course from four different industries in the agribusiness sector. Upon deciding and securing the agreement on each selected case, an intensified interview process was carried out by twenty-eight informants from the six selected sites located in three geographically different regions in China. Most of the documentary evidence were collected on the spot during the interviews, and some were collected by mail few days after the interviews. The data collection process was completed at the beginning of August 2001. During the later data analysis process a few clarifications were later made with informants via phone calls.

To increase the quality of a case study, the evidence collecting process was carried out by following through Yin's (1994:90-99) three principles: 1) use of multiple sources of evidence; 2) creating a case study data base, and 3) maintaining a chain of evidence.

1) **Use of multiple sources of evidence:** according to Yin, a major strength of case study data collection is the opportunity to use many different sources of evidence. It allows an investigator to develop converging lines of inquiry - technically called the "triangulation process." Following this logic, any finding or conclusion in a case study is likely to be much more convincing and accurate, because it is based on several different corroborating sources of information (Yin, 1989:97). Figure 29 illustrates an adapted triangulation process which was followed in the data collection process.

Figure 29: Triangulation process

Source: Adapted from Yin, R. (1994). *Case Study Research: design and Methods*. Thousand Oaks, Sage.

A structured survey questionnaire was constructed for the different actors, covering four main contextual areas: 1) the formation context, 2) development context, 3) broker behavior context and 4) performance context (Appendix II). Three interview guides were developed, respectively, for the brokers (60 questions),¹⁸ the stakeholders (62 questions),¹⁹ and the members or partners (58 questions). The three guides have a similar pattern in general, but with different questions and questioning angles structured and adapted to the different interviewees.

The data collecting process was planned **to interview five informants for each case**. Due to emergent changes, meetings with two individual NW participants were cancelled. However, equivalent NW participants were interviewed. Consequently, a total of **twenty-eight interviews** were conducted in the **six cases** ($n = 4, 5, 4, 5, 5$ and 5 , or 84 per cent). The informants interviewed were the present and former top executives and owners of the lead firms and NW participating organizations, major NW stakeholders, and relevant governmental agents who were decision makers and played important roles during the NW building process. **All informants had the highest degree of familiarity with and expert knowledge of the NW cases investigated.** In order to obtain confirmatory information and further insight into the history of these NW's relationships other individuals involved in the design and formation of each NW who were no longer in the firm, as well as those who were based elsewhere in China, were interviewed as well.

The same interview procedure was used with all respondents and **each interview lasted from 2 to 2½ hours** (with some informants the interviews lasted for 3 hours).

¹⁸ Including the managers from the broker's organization who operationally manage the current network activities

¹⁹ Stakeholders mean: shareholders, parent firms, customers, suppliers, distributors, research institutions, financial institutions and relevant government departments

One interviewer conducted the interviews of the four agrochemicals and fertilizers cases in Shanghai and Xian. For the two researching oriented sites in Beijing, one additional interviewer with a biology background was invited to accompany the process while providing assistance on technical terms and coordination of the interviews. The interview schedule contained both structured and open-ended questions.

As mentioned before, all the six NW cases investigated in this dissertation involve more than two partners. The fivefold interrogation on the same topic thus provided strong information bases for cross-examining the responses collected from the informants in addition to their individual views on the subject.

According to expert's opinion and the past experience of the researcher, most of the interviewees in the agribusiness sector in China felt uncomfortable and reluctant to express themselves in front of a microphone, therefore interviews were not taped. All interviews were conducted orally in Mandarin Chinese and interview questions of written form were in both English and Chinese versions. Upon completion of each interview, informants were asked to sign on the interview guide. The interview notes and impressions were preliminarily analyzed within one day of the interview in accordance with the twenty-four-hour rule (Yin, 1989). The data collected was translated into English from Mandarin Chinese and then transcribed during the following days after the interviews.

The documentary evidences collected during the interviewing process include: contracts, articles of association, company brochures, meeting minutes, newspaper clippings, working reports, speech papers, correspondences and website downloading materials. Data evidences, working transcriptions, interview notes, and the final theses are kept in both Chinese and English versions.

2) Creating a case study database: according to Yin (1989:99) the lack of a formal database for most case study efforts is a major shortcoming of a case study research. Therefore, the second principle of Yin (1989:97) has to do with the way of organizing and documenting the data collected for case studies. Documentation generally consists of two separate collections: **the data or evidentiary base, and the report of the investigator - whether in article, report, or book form.** The database can be the subject of a separate, secondary analysis, independent of any reports by the original investigator. In order to provide a resource to a critical reader if he or she wants to inspect the database that led to the case study conclusions. Data collected was organized in a manner that in addition to a description for each case study attached in the Appendix I, a formal retrievable database (that includes interview transcriptions, notes, documentary evidences - as listed in the above paragraph for each case study) was developed. The data base suits the purposes of acting both as an efficient data analysis of Chapter 4 of the current study, and for the investigators who may need to review the evidences directly without being limited to the thesis alone. Finally, the database developed in this research is generally open for academic purposes - excepting some individual points of view or information expressed by the specific partners that may be sensitive to the relationship with their partners. Under such circumstances, prior consents to be obtained from the informants are necessary.

3) Maintaining a chain of evidence (Yin 1989:102) was the third principal followed by this study to increase the reliability of the information in the case studies. According to the principle, external observers - the reader of the case studies for

example, were allowed to follow the derivation of any evidence from the initial research questions to the case study conclusions. The evidence presented in the case study reports was assured by the same evidence collected in the field investigation. All original evidence has been carefully kept without bias. To maintain the chain of evidence in the case studies of this dissertation, relevant portions of the case study database - the specific documents, interviews and observations - were cited, and the date, time and venue of interviews, and the circumstances under which the data were collected were indicated. Finally, data collection followed the procedures stipulated in the case study protocol, which links to the initial research questions of the study.

3.3.2.3.6 Criteria to Judge the Research Design Quality

According to Yin (1989:40-45, 1994:23-38) a research design is supposed to represent a logical set of statements for judging the quality of any given design. Whether one is doing a case study or any other type of social science, four logical tests are relevant: 1) *construct validity*; 2) *internal validity*; 3) *external validity*, and 4) *reliability*. Table 28 indicates the identification of several tactics for dealing with these four tests.

Table 28: Case Study Tactics for Four Design Tests

Tests	Case-study tactic	Phase of research in Which Tactic Occurs
Construct validity	Use multiple sources of evidence	Data collection
	Establish a chain of evidence	Data collection
	Have key informants review draft case study reports	Composition
Internal validity	Do pattern matching	Data analysis
	Do explanation-building	Data analysis
	Do time-series analysis	Data analysis
External validity	Use replication logic in multiple-case studies	Research design
Reliability	Use case study protocol	Data collection
	Develop case study data base	Data collection

(Source: Robert K. Yin, 1989 in "Case Study Research Design and Method": 41)

- 1) **Constructive validity:** critics towards case studies point out the fact that a case-study investigator fails to develop a sufficiently operational set of measures and that "subjective" judgments are used to collect the data. Three tactics are available to increase construct validity: a) the use of multiple sources of evidence, in a manner encouraging convergent lines of inquiry, and this tactic is relevant during data collection; b) establishment of a chain of evidence, also relevant during the data collection; and c) having the draft cases study report reviewed by the key informants. The three tactics were applied in the case studies of this dissertation as presented in the preceding section 3.3.2.3.5.
- 2) **Internal validity:** is a concern only for explanatory or causal studies, where an investigator is trying to determine whether event X led to event Y. If the investigator incorrectly concludes that there is a causal relationship between X and Y, without knowing a third factor Z may actually have caused Y, the research design has failed to deal with some threat to internal validity. Second, the concern over internal validity for case study research may be extended to the broader problem of making inferences. Basically, a case study involves an inference every time an event cannot be directly observed. Thus an investigator will "infer" that a particular event resulted from some earlier occurrence. Based on interview and

documentary evidence collected as part of the case study, is the inference correct? Have all the rival explanations and possibilities been considered? Is the evidence convergent? Does it appear to be airtight? A research design that has anticipated these questions has begun to deal with the overall problem of making inferences and therefore the specific problem of internal validity.

This study explains the rationales of the strategic conduct of the firms in forming a NW alliance in the context of the Chinese agribusiness sector, and explores the relationship between process and performance in the NW organizations - with particular emphasis on the brokers' roles and behaviors. **Interviewing five actors with divergent interests in each NW increases the validity of the conclusions drawn by this study.**

- 3) **External validity:** the third test deals with the problem of knowing whether a study's findings can be generalized beyond the immediate case study. Critics state that single cases offer a poor basis for generalizing. This analogy to samples and universes is incorrect when dealing with case studies (analytical vs. statistical generalization). In analytical generalization, the investigator is striving to generalize a particular set of results to some broader theory. This theory must be tested through replication of the findings in a second or even third case, where the theory has specified that the same results might be accepted for a much larger number of similar cases - even though further replications have not been performed. This replication logic is the same that underlies the use of experiments and allows scientists to generalize from one experiment to another. Since **multiple-case studies were used in this dissertation, the analysis followed cross-experiment rather than *within*-experiment design and logic.**
- 4) **Reliability:** demonstrating that the operations of a study, such as the data collection procedures, can be repeated with the same results. The objective is to be sure that, if a later investigator followed exactly the same procedures as described by an earlier investigator and conducted the same case studies under the same circumstances and conditions all over again, the later investigator should arrive at the same findings and conclusions. The goal of reliability is to minimize the errors and biases in a study. To accomplish this purpose the procedures followed must be well documented.

3.4 CONCLUSION

This chapter first justified the choice of research strategy and, meanwhile, described the methodology used and procedures followed to provide data to investigate the research questions as defined in Chapter 1. This chapter also gave a presentation of the empirical field and selected case studies. Finally, the chapter introduced the case study approach and design in this research. The data collected will be analyzed in the coming chapter.

4 DATA ANALYSIS

4.1 INTRODUCTION

Section 3.3.2.3.3 briefly introduced six NW case studies investigated in Beijing, Shanghai, and Yichuan, during March, July, and August 2001. This chapter follows the research design as it was exposed in the methodological section and devotes itself to presenting and analyzing data collected through the interviews.

As previously explained, interviews were held in six sites, four in the agrochemicals and fertilizer business with **mature industrial** and **market** characteristics, and two in the hybrid seeds business and honeybee pollination service business with new **technological** and **market** potential characteristics. These six investigated sites represent organizations in the agribusiness sector with different forms of ownership systems and engagement in different activities.

Chapter 4 begins with section 4.2 investigating the external **environmental** factors of China's transitional economic reform process which impacted the actors' strategic conduct in pursuing alliance relationships in NW form cooperation.

Section 4.3 deals with the topic of **actors** in the NW groups with an objective of examining the specific attributes on different types of actors and their original activities, to gain an understanding of the relationship between types of actors and their behavioral patterns demonstrated in the NW building process.

Section 4.4 is specifically dedicated to the **objective** of the actors in relation to their strategic conduct of forming NWs.

Section 4.5 investigates the relationship between the **resource** and actors' motives and behaviors in relation to their forming and operating the NW form cooperative arrangement.

Section 4.6 presents and analyzes **the structural and relational properties** of the NW groups focusing on 1) the qualitative "content" of the activities realized in the NW groups and the relations resulting from the nature of these activities, and 2) the formal structure of the relations and the measurement of these relations.

Section 4.7 identifies and analyzes the attribution of the activities on the different NW participants and brokers in particular, their **roles and behavioral patterns** in relation to the NW building process.

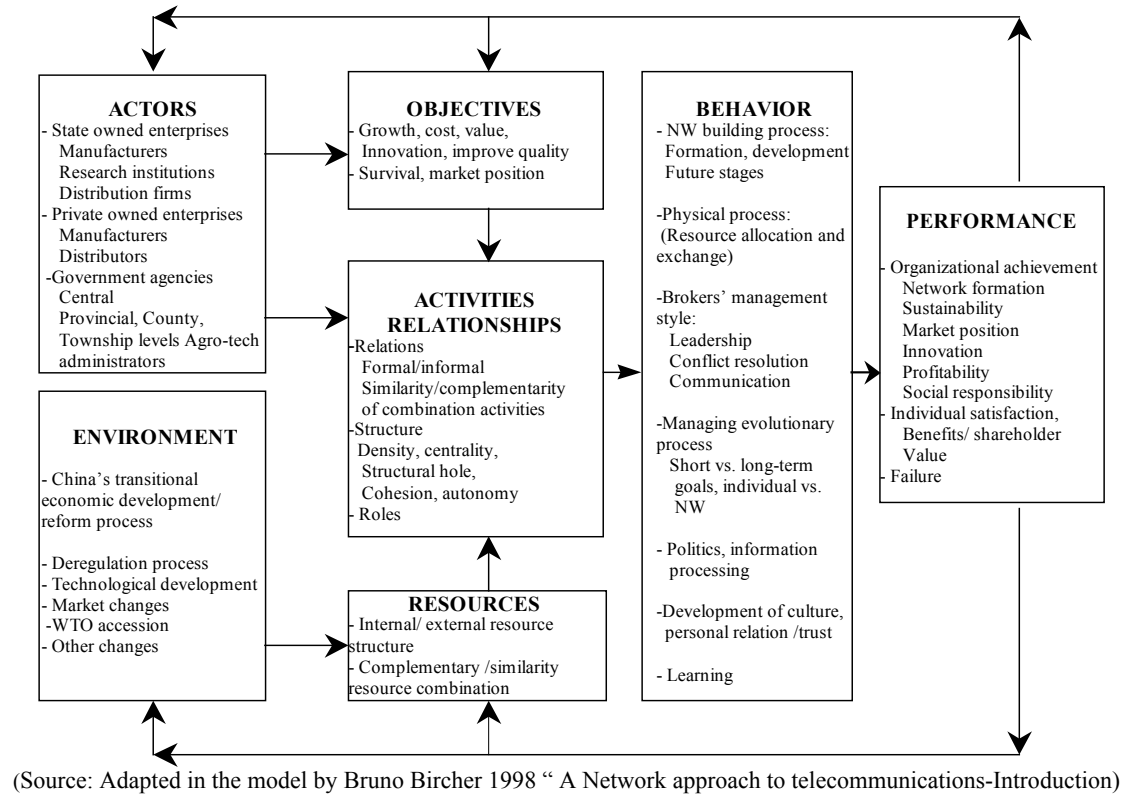
To follow the dynamics of each individual NW, section 4.8 especially focuses on analyzing the **differences** between the same types of NWs, and their **impacts** on the NW building process and outcomes.

Section 4.9 appraises the **performances** and **results** of each NW in terms of organizational achievements and personal satisfaction of the individual NW participants.

Finally, the chapter ends with section 4.10 presenting some key factors of the successful and unsuccessful NW building process based on the views and experiences of the NW participants interviewed and the final **conclusions** of Chapter 4.

Following the framework presented in Figure 1 in section 1.2, the key variables to be analyzed in this chapter are specifically adapted to the contextual elements of this research as illustrated in Figure 30 below.

Figure 30: Strategic NW in the China Agribusiness Sector– Variables to Analyze



4.2 ENVIRONMENT ASPECTS

Sections 1.1 and 2.4 updated a macroeconomic overview of China's economic development and reform process. Section 3.3.2.3.2 specially introduced the agribusiness sector and each selected an empirical research field. The objective of this section is to present and analyze these specific areas which have direct impact on the strategic conduct of the actors in forming NW alliances. Additionally, *the actors' preferences* on the types of cooperative arrangements under the present environmental conditions in China are investigated based on the survey results from questions 45 (member) 47 (broker and stakeholder) of the interview guide.

It is necessary to remind readers that the abbreviated names of the NW actors appearing in the successive chapters of this dissertation are in correspondence with the actors' names classified in the brief introductions of each NW case presented in section 3.3.2.3.3.

4.2.1 Key Changing Areas

The presentation of the key changing areas related to the actors in the NW groups begins in section 4.2.2.1, analyzing the impacts of the Government's deregulation process on the actors' activities. Section 4.2.2.2 examines these most direct and

important environmental factors affecting the actors' strategic conduct in forming NW alliances - such as technological development, market changes, and China's accession to WTO.

4.2.1.1 Deregulation Impacts

The predominant characteristics of deregulation and government intervention of China's economic reform have created both opportunities and challenges to the actors in the NW groups investigated. Accordingly, the actors' reactions to the environmental factors in relation to their respective interests were different too. Question 43 (member) and 45 (broker/stakeholder) of the interview guide asked informants *"what specific regulatory changes over the last 10 years have impacted your business, the formation and development process of this cooperative organization/activity?"* The responses from the informants in relation to the impact resulted by the regulatory changes are presented in the following four areas: 1) State research institutions engaging in gainful economic activities; 2) the active participation of non-State owned enterprises in strategic alliance; 3) change from a controlled supply and demand system to a market system and 4) enforcements of legislation.

4.2.1.1.1 State Owned Research Institutions

Before China's economic reform, State scientific research institutions such as the Seeds broker, the Bee broker and the Vegetable researcher in the Hybrid seeds and Honeybee NWs, the Agro-researcher, the Chemical engineer and the Pomology researcher in the Compound fertilizer and the Biofertilizer NWs, were not eligible to engage in business operation or gainful economic activities. However, because of the new government policy, State scientific research institutions were encouraged to participate in the market economic activities. On the other hand, the traditional State research budget allocation system had been reformed by reduction as Mr. Zhou, the Agro-researcher in the Compound fertilizer NW explains: *"Since 1998, the State financing for research has been changed to a free tender system, resulting in fewer allocated expenses. However, for our institute this means an opportunity because of the strong technical position we have."* The changes had brought opportunities for the research institutions to gain income based on their professional competence. Operationally, incentive schemes were implemented to the extent that an individual researcher could get as much as 10% of the economic return as reward for the individual's contribution to the specific project. According to Mr. Sun, the Vegetable researcher in the Honeybee NW, all previous research results went to the State. Similarly, Mr. Xiang, the Seeds reproducer stated: *"the 1997 new policies allowed agrotechnical stations to be involved in economic activity."* The governmental agrotechnical administrators at county and lower levels such as the Seeds reproducer, the Parent seeds producer, and the Township administrator in the Hybrid seeds and Honeybee NWs and the Science bureau, and the Pomology researcher in the Biofertilizer NW also became eligible to engage in gainful economic activities. The new government policies motivated many actors with desired resources to actively participate in the market economic activities. The detailed profile of these groups of actors will be presented and analyzed in section 4.3 when analyzing the State owned research actors and local level government administrators.

4.2.1.1.2 State Owned Distribution Systems

The change from a centrally controlled supply and demand system of agroindustrial products to a market system had quite a different impact on the fate of the actors in the Agrochemicals and the Ammonia NWs and the SODE broker in the Compound fertilizer NW and the Seeds distributor in the Hybrid seeds NW. The reform had abandoned SODE actors' previous monopoly positions supported by the State central planning system and called for their endeavor to fight in market competition. As Mr. Chen, the SODE broker in the Compound fertilizer NW acknowledged: “*Since 1992, the previous exclusive status of agricultural means and materials has been changed. We must compete now.*” To this particular group of actors, the change processes were drastic and difficult to handle. Because of the long operational habit and cultural experience acquired in the highly centralized SOE system environment, actors had gotten used to a passive attitude towards taking initiative actions and expecting solutions from the superior levels. As Mr. Gao in the Agrochemicals NW expressed, he and his colleagues all felt that the change process had created too much uncertainty. In the Ammonia NW case, the deputy manager of Fengxian Fertilizer plant said that: “*before 1998, plants were less pressured under the central planning system, now the government abolished AMPC's exclusive right but also created pressure on the small plants to sell their outputs.*” The change of the SODE broker's exclusive distribution right of agricultural materials have, on the one hand, brought opportunity to the plants, but have discontinued financial subsidies to them on the other. Under these circumstances the small chemical plants could not take advantage of the opportunity because of their weak bases. Section 4.3 will analyze the State owned distribution actors in detail.

4.2.1.1.3 Private Owned Enterprises in Strategic Alliance

The government's encouragement of the development of non-State owned new and high-tech enterprise, in terms of providing favorable tax treatments and equal conditions of SOEs, had enabled private actors such as the POE broker and the Biofertilizer distributor in the Biofertilizer SNW to play important roles in the NW alliance building process. Externally, the open policy has attracted a great number of overseas Chinese investments and technologies into the Mainland economic construction. For example the Fertilizer producer, a Taiwanese private manufacturer in the Compound fertilizer NW, actively develops its Potash business in Mainland China. Section 4.3 will deal especially with the private actors.

4.2.1.1.4 Reinforcements of Protection on Intellectual Property

The research institutions and individuals both at home and abroad welcomed the actions taken by the government in reinforcing intellectual property protection. As a consequence of the improvement, increasingly more new technologies and products were introduced into the country over recent years. This was also a situation in the agribusiness sector. Other business related legislative improvements are those regulations concerning antitrust and unfair competition practice activities. Although there is still much more to be done, the overall development in the business legislative areas has been progressing towards an improved business environment.

Evidently, in the NW groups, the reinforcement of protection on intellectual property motivates the research organizations actively involved in economic activities. The Seeds broker in the Hybrid seeds NW appreciated the new seeds law which regulated

seeds business activities and protects his technology. Mr. Jiao from the Seeds distribution company expressed the same appreciation when responding to question 46 of the interview guide: *“Our business interests have been protected by the enforcement of the new seeds law.”* Similarly, the Bee broker worried less about expanding his pollination business into a nationwide scale operation with many loosely linked partners, largely because patent law protected his specially designed bee equipment. In the case of the Biofertilizer NW, the POE broker welcomed the new registration system, which strongly supported the biotech products. Finally, the Pesticide researcher in the Agrochemicals NW, conducted an overall cooperation on the laboratory and field projects with renowned multinational firms and a great number of domestic pesticide manufacturers. The improved protection on technologies brought confidence to the researchers and the actors the possessing technologies.

4.2.2 Other External Impacts

China’s domestic economic reform and development took place during an era of rapid development of the globalization process. Like most other industrial sectors in the country, the enterprises in the agribusiness sector are unavoidably affected by both internal and external factors. To study those environmental factors which most directly impacted the types of actors and activities in the NW groups of this research, the focal point was spotted on the areas of rapid technological development, changing relationships between the supply and demand systems, and increasing emergence of pressures to the agribusiness enterprises brought in by the globalization process. Question 44 (member) and 46 (broker) asked the actors *“Which of the factors are mostly concerned by your business: China’s entrance to the World Trade Organization, Globalization process, technological development and market changes and why?”* Data collected showed that the most concerned environmental factors impacting informants’ business activities in the NW groups are: **technological development, market changes** and the **China’s recent accession to the World Trade Organization** (refer to Appendix XXI).

4.2.2.1 Technology Development

Data collected through question 44 (member) and 46 (broker) of the interview guide showed that most of the technology related actors in the NW groups considered the technological development was an important factor that has a direct impact on their business. However, concerns varied from the different types of actors. To elaborate, the first type of actors are those technologically advanced research institutions such as the Seeds broker and the Bee broker in the DNWs group, the Agro-researcher, the Chemical engineer and the Pomology researcher in the SNWs group and the Pesticide researcher in the Agrochemicals NW. This type of actor is encouraged by the policy to generate income through commercializing their knowledge or, as Professor Zhou the Agro-researcher in the Compound fertilizer NW - said, to compete openly in nationwide project tenders. The policy aims to encourage research institutions taking initiatives of engaging in market relationships and generating financing sources rather than relying solely on the State funding which mainly guarantees the priority research projects mandated by the State. Consequently, the research actors increasingly involved in commercializing their technologies or services to the market transactions. The second types of actors are those who are technologically outdated, and therefore

pressured by the rapid technological development from competitions. The actors in the NW groups belonging to this category are the three big pesticide manufacturers in the Agrochemicals NW, and the six small fertilizer producers in the Ammonia NW. On the one hand, most of the State owned agrochemical enterprises operated with low economic performance due to the problems of the technically obsolete and low quality product they produced. Further, in the overly supplied market too many plants produced too similar products in small batches to generate the needed return to properly maintain the facilities and develop new technology. On the other hand, the new generation of products featured with high efficacy, lower side effects, and even competitively priced by the increasing presence of large multinational firms have further pressured the actors in this group. The urgency of improving product quality and its impact on the survival and development of the State owned agrochemical enterprises, were highly recognized and became the priority task for the State industrial administrators at all levels. The formation of the Agrochemicals NW in connection to the South Pesticide Syntheses Research Center and the Ammonia NW were just part of the initiatives taken in a direction to revitalize the enterprises with a particular emphasis of technological development - as presented in the case descriptions of the two INWs (see Appendix I, 5-6 and 6-6). The efforts, in general, enabled many SOEs to reposition themselves on to healthy tracks of economic development. Nevertheless, the cases of the two INWs in this study did not seem to fall into this category. The causes of the failure of the Agrochemicals NW and the difficult situation of the Ammonia NW are to be analyzed throughout this chapter.

The actors specializing in distribution, such as the SODE broker in the Compound fertilizer NW, the Seeds distributor in the Hybrid seeds NW and the Biofertilizer distributor in the Biofertilizer NW were constantly in search of new products for their pipelines in order to remain competitive. For this group of actors, new products, derived from the technological development that would have a direct impact on their business.

The State agrotechnical administrators such as the Agro-tech center in the Compound fertilizer NW, the Seeds reproducer in the Hybrid seeds NW, the Township administrator in the Honeybee NW, and the Science bureau in the Biofertilizer NW, have the tasks of advancing technological development at all levels of their jurisdiction. In all local government structures, there are departments responsible for science and technical development for their own regions. The government actors in the NW groups mainly performed this duty through their participation in the respective NWs.

4.2.2.2 Market Changes

The informants, interviewed from all NW groups, considered that the ever-present changing situations in the agribusiness market have an important impact on their business activities and decision of participating in the NW cooperation. The NW actors who have particular concern on the market changes were mostly those involved with sales and marketing activities including the Seeds broker, the Seeds distributor, and the Bee broker in the DNWs, the SODE broker, the Biofertilizer distributor and the POE broker in the two SNWs, and all members of the Agrochemicals and Ammonia INWs.

The country's economic reform in the supply and demand systems has freed enormous autonomy for the enterprises to develop their business; however, it has also

created new challenges. Abandoning the previous exclusive distribution system for controlled agricultural materials, such as pesticides and fertilizers, enabled manufacturers to directly approach the market which was traditionally monopolized by a few players such as the State owned Agro-distributor and Seeds distributor. However, adversely, direct suppliers from the factories overcrowded the market. Consequently, the chaotic situation of disorderly competition among the producers often led to price wars and dumping activities as in the Ammonia NW case. The agribusiness market is affected by factors such as the increasing competition of multinationals, new regulations of ecological requirement, price fluctuation of farming outputs, natural climate changes and weather conditions, promulgation of new restrictions on food residues, trade wars with export destinations, oversupply of same products, new relationships between suppliers and distributors etcetera... As a result, the market became even more dynamic with numerous new players playing new business games with increasing varieties of product and service for the customers whose buying behavior and consumption patterns are constantly changing. Like other industrial sectors, the agribusiness market is a place of opportunities and challenges both brought by the market changes. The actors in the NW groups faced a high degree of uncertainty in the agribusiness market over the recent years. Consequently, in order to reduce the above uncertainties, the actors in the NW groups formed strategic alliance relationships with each other jointly - striving for common interests. The motives and objectives of the actors in participating in NW cooperative arrangement are presented and analyzed in sections 4.4 and 4.5.

4.2.2.3 Impact of WTO Accession

According to the survey results, most of the actors in the NW groups viewed China's recent accession to the WTO as both an opportunity and threat - based on each of their own situations. Mr. Wang Luxian, the Secretary general of the CNPA and former Director of Production Planning for MCI had a most positive view on the subject. He believes that China's accession to the WTO has strategically accelerated the pace of the Chinese enterprises' engagement with the economic globalization process - with increased practice according to international market rules as an added bonus. This view represents the official stand of the State industrial administrators. However, Dr. Zhao, the Seeds broker in the Hybrid seeds NW thought that WTO membership meant a 'double edged sword' to the type of business activities his firm is involved in: *"with China's joining WTO major multinational firms have entered into China's market and some attempted to swallow our technology. We, on the other hand, are also striving for a fast development. We are looking at North American wheat growing market (in USA and Canada) as well."* The situation of the Hybrid seeds NW can be generalized for the many enterprises which see the market opening further to advanced counterparts from abroad as posing pros and cons to their business operations. Professor Zhu, the Agro-researcher in the Compound fertilizer NW echoed with this view: *"China's entrance into WTO will result in a large quantity of foreign fertilizer (on the market), which will create more pressure on the domestic industry. However, this also brings opportunities for Chinese firms to increase their exports."* Nonetheless, those who have their primary business focus on the domestic market, hold a more defensive position towards the subject. As Mr. Jiao, the Seeds distributor in the Hybrid seeds NW said: *"WTO entrance will bring more foreign seeds companies to compete in China and market growth depends on advanced technology."* For the other participant in the Hybrid seeds NW, Mr. Xiang, the Seeds

reproducer was more concerned that “*China’s entrance to the WTO might reduce wheat-growing area, due to increased imported agricultural products*” which, as a county agrotechnical administrator, was a new situation for him and his organization to face.

Other actors expressed their views about China’s entrance into WTO in a broader sense such as the existing and potential effect of an increased amount of foreign firms competing not only in the market share of products and service, but also in the areas of human resources. One often repeated story is the fear of brain drain from State owned organizations to foreign funded enterprises, due to better compensation packages and career development opportunities.

Generally speaking, China’s WTO accession - from a short-term point of view- could cause many Chinese enterprises in the agribusiness sector to suffer from foreign competition with better quality products, services, technology, and management capabilities. Nonetheless, the ever-tough competition simultaneously pushes Chinese enterprises to undertake an overall quality improving process. Therefore, from a long-term point of view, these short birth-pains are not only inevitable, but also necessary for shaking an enormous sector which is too traditionally structured and operated under a long central planning system. The above views expressed by Mr. Wang Luxian have generally reflected the authorities’ stand in this regard.

4.2.3 Preferred Forms of Alliance Cooperation in the Agribusiness Sector

The preceding section presented some key environmental aspects which had an impact on the actors’ activities in relation to their participating in the NW cooperation. This section attempts to find out one additional environmentally related point which is what are **the actors’ preferences** on the types of cooperative arrangements which particularly **suites to the agribusiness sector** under the conditions of China’s business environment. The objective of this inquiry is to find out what are the real elements in the NW form cooperative arrangement interesting the actors in relation to the environment.

For this purpose, questions 45 (member) 47 (broker and stakeholder) asked informants “*what type of organizational form and cooperative arrangements are more suitable for the agribusiness sector at China’s present economic development stage/ and why?*” The survey results are presented in the following sections along each type of NW group.

4.2.3.1 The Hybrid Seeds and Honeybee DNWs

Professor Zhao, the Seeds broker in the Hybrid seeds NW, expressed his view that a suitable form of cooperative arrangement should consist of “*participants coming in with reasonable resources composition (complementary resources), and risks being shared by all parties involved.*”²⁰ Finally, each partner maintains his independent status.” This has shown a preference of maintaining an interdependent cooperative relationship rather than a fully integrated arrangement.

However, Mr. Wang, the head of the Honeybee NW, preferred cooperative arrangement in the present environment to be the type of “*complementary*

²⁰ Comparing to the previous practice when farmers had no risks because of the full State subsidy system, under which, enterprises had to bear all the risks.

cooperation with loosely coupled relationships.” Mr. Liu Guocai, head of the Beekeepers association, agreed with Mr. Wang: “ *a loosely linked cooperative relationship is good.*”

Further, the government actor, Mr. Xiang, the Seeds reproducer stressed that a suitable form of cooperative arrangement for the agribusiness sector should be a “*loosely linked and with complementary resources and cooperative relationships between the partners.*” Mr. Liang, the Parent seeds producer, felt comfortable about the existing model of arrangement that his organization is involved in and their part of the Hybrid seeds NW as he said: “*our present form of cooperation with the Seeds broker (and other partners) is suitable for the agribusiness sector.*” Mr. Jiao, from the Seeds distributor, shared the opinion of the above colleagues in his NW. He believed that to operate in the agribusiness environment, “*a loosely linked cooperative relationship (between partners) is good because of the present economic constraints we have.*” He meant that a flexible relationship between the cooperative partners better suits the needs of enterprises which normally have limited resources to be distributed to more commitment of activities.

The actors in the two DNWs unanimously considered that *complementary cooperation linked by a loose relationship* between partners is the most suitable form of cooperative arrangement in the agribusiness sector at present time. Besides this, the Township administrator in the Honeybee NW, Mr. Xu Chengmao, emphasized the importance of including the local government actors into the cooperative arrangement “*...Because of its influence in the countryside.*” The participation of the government actors and their particular roles in the NW cooperation will be presented in the successive sections throughout this chapter.

4.2.3.2 The Compound Fertilizer and Biofertilizer SNWs

In the two SNWs, actors have almost identical responses to questions 46 and 47, as do the actors in the DNWs, in terms of their common views toward the type of cooperative relationships between the actors operating in this particular environment. Mr. Chen, the SODE broker in the Compound fertilizer NW, specified to some extent that these synergic forms of cooperation are “ *organizations cooperating with complementary resources in the areas of agriculture, industry and commerce, research, production, supply and distribution.*” Mr. Chen, the Fertilizer producer, has developed profound experiences engaging in different forms of alliances in China during recent years. He elaborated on the advantages of the flexible form of relationship in comparison with other forms of alliances saying, “ *... the wholly owned enterprise has high risk, while the Joint Venture form (of cooperation) depends on one’s luck in finding suitable cooperative partners...*” this remark reflected his concern of entering into tightly arranged relationships with uncertainties. The other three participants in the Compound fertilizer NW have loosely coupled relationships with the SODE broker and the Fertilizer producer. They all considered the existing cooperative structure with *complementary resources* between the partners the most suitable form of cooperation.

In addition to the similar preference on complementary cooperative arrangement with loosely linked relationships between the partners as the actors from other NWs, the four informants interviewed from the Biofertilizer NW had formulated a model of “*Supplier + Bank + Government + Distributor + Farmers*” as the most preferred form of cooperative arrangement under the present environmental conditions.

4.2.3.3 The Agrochemicals and Ammonia INWs

The actors in the two INWs mostly emphasized ‘partners with **complementary resources**’ as important elements to suitable forms of cooperation in the agrochemical industry. Another noticeable phenomenon is that despite the fact that all actors are SOEs, they expressed strong preference towards cooperating with **non-SOEs**. Mr. Wang Luxian expressed a preference of cooperating with non-SOEs with technologies in the shareholding system. The former president of the Agrochemicals NW and present deputy general manager of a Sino-US JV, Mr. Lang still preferred to cooperate with the large industrial conglomerates. Other actors, like the former deputy director Mr. Gao, preferred “*Market based cooperation by privately owned partners with complementary resources.*” Two former deputy directors of the Agrochemicals NW, Mr. Lu and Mr. Guo, clearly preferred the *complementary cooperative partnership*. Mr. Guo was particularly in favor of forming alliances with multinational firms which have *complementary resources*. His research institute already has several successful cooperative projects with renowned multinationals such as Bayer, DuPont and so on²¹.

In the Ammonia NW, all informants interviewed have shown strong preference for complementary resources aspects brought in by the participants. Mr. Zhou, the SOIE broker, preferred “*organizations cooperating with complementary resources between industry and commerce.*” Concerning the degree of ties between the partners, he preferred a “*semi-close relationship between partners who hold each others’ company shares.*” At the operational level, Mr. Liu Ming the GM of the Ammonia NW, had the same view as his boss. He believed that the most suitable form of cooperation in the agribusiness sector should be “*organizations cooperating with complementary resources between agriculture (farming), industry, and commerce.*”

Other members of the Ammonia NW such as Mr. Zhu, manager of the Qingpu fertilizer plant, liked to engage in “*market oriented cooperation (versus arranged relationships), with privately owned partners with complementary resources.*” Mr. Tian, manager of the Fengxian, fertilizer plant felt that “*cooperating partners having complementary resources*” was the most important element for a cooperation which suites to the sector.

Based on the above data collected, the cooperation between partners who have complementary resources is considered a commonly preferred form of cooperation in the present agribusiness sector by the actors from all NW groups in this research.

To summarize, section 4.2.3 has presented and analyzed these environmental aspects which have direct impacts on the strategic conduct of the actors in forming strategic alliances. The environmental dynamics posed both opportunities and challenges to the actors in the NW groups. The four major changes, resulting from *deregulation and government intervention* as presented in section 4.2.1.1, were identified as the most direct and important impact on the business activities of the actors in the NW groups and were primarily responsible for their decisions of participating in the NW form cooperation. Finally, concerning the question of most suitable forms of alliance in the agribusiness sector under present environmental conditions, all informants interviewed from the NW groups have expressed common preference to the form of

²¹ Bayer (a German firm) and DuPont (a US firm) are both large, multinational chemical groups.

cooperation between partners who have **complementary resources** with **loosely coupled cooperative relationships between the partners**.

4.3 ACTORS AND ACTIVITIES

This section specially focuses on presenting and analyzing the actors in the NW groups. Different actors are structured into groups by their ownership systems, business activities, and organizational natures. The objective of this section, as stated before, is to gain an understanding of the relationship between the types of actors and their behavioral patterns in the NW building process through identifying and examining the specific attributes to the actors in the NW groups.

The information concerning the actors investigated are mainly collected from published materials and introductions of the informants interviewed. More detailed information of each actor and their activities is provided in the case descriptions (see Appendix I).

Section 4.3.1 begins to introduce the different types of actors and their originally identified activities. The introduction of each actor is rather brief, since a relatively detailed introduction of each actor is given in the case description (see Appendix I). It is then followed by a breakdown of the subject into sections 4.3.2 Government agency actors, 4.3.3 State owned enterprises and organizations, and section 4.3.4 private owned enterprises.

Finally, section 4.3.5 concludes with an overview on the transitional aspects of the actors through presenting some trajectory tendencies of the actors as observed during the data collection process.

4.3.1 Different Attributes of the NW Actors

As shown in section 3.3.2.3.3, the actors in the NW groups are different in many aspects. The NW groups investigated in this dissertation consist of four NWs in the agrochemicals and fertilizer business with **mature industrial and market characteristics**, and two NWs in the hybrid seeds and pollination service business characterized by **new technology and growth market potentials**. The **twenty-nine institutions** in the six NWs involved in different types of activities ranging from manufacturing, distribution, research, and chemical engineering, to the government functions of agrotechnical administration.

In addition, the different ownership systems attributed to the actors is another important aspect demonstrated in the NW groups. Among all of the actors in the research, eight are Government agent actors at different administrative levels, twenty are State owned organizations, and four are privately owned enterprises.

Given the fact that considerable differences existing among the actors in the NW groups, the cultural aspect between the NW partners and its influence on the actor's behavior in the NW cooperation is analyzed in section 4.7.2.1 - together with the topics of development of personal relationship and trust. Table 29 provides a classification of the different actors in the NW groups of this research.

Table 29: Different Types of Actors in the NW Groups

THE TYPE OF ACTORS IN THE NW GROUPS * = BROKER			ORIGINAL ACTIVITIES	NWs
GOVERNMENT AGENCY ACTORS	Central and provincial level industrial administrators	MCI	Strategic policy making/administration of national Chemical industry	The Agrochemicals (INW)
		*The State broker *The SOIE broker	Policy supervisory administration of the chemical industry at provincial level	The Agrochemicals and Ammonia (INW)
	Provincial/ County/ Township level agrotechnical administrators	The Agro-tech center/ The Science administrator /The Parent seeds producer/The Seeds reproducer/The Township administrator	Rural agricultural science and technology extension	The Hybrid seeds and Honeybee (DNW) The Compound fertilizer (SNW)
SOE ACTORS (State owned enterprises and organizations)	State owned industrial enterprises (SOIEs)	The Insecticide producer/The Fungicide producer / the Herbicide producer /*The SOIE broker /The Marketing center/the Fengxian fertilizer plant/the Qingpu fertilizer plant/ NFP/ CFP/ CCP/ PCP	Manufacturing and distribution of agrochemical fertilizer products	The Agrochemicals and Ammonia (INW)
	State owned research institutions (SORIs)	* The Seeds broker /The Vegetable researcher/ the Bee broker/ the Pesticide researcher/the Agro-researcher /The chemical Center /The Pomology researcher	Research of agricultural science and technology	The Hybrid seeds and Honeybee (DNW) The Compound fertilizer (SNW) The Agrochemicals (INW)
	State owned distribution enterprise (SODEs)	*The SODE broker The Seeds distributor	Distribution of agricultural means and products	The Compound fertilizer (SNW)
POE ACTORS (Private and collective owned enterprises and organizations)	Collectively owned association by the private apiculturists	The Beekeepers Association	Policy lobbying, coordinating technical / commercial activities for the apiculturists	The Hybrid seeds (DNW)
	Privately owned industrial enterprise	*The POE broker	Manufacturing and distribution of Bio plant nutrient products	The Biofertilizer (SNW)
	Privately owned distribution enterprise	The Biofertilizer distributor	Distribution of agrochemicals and fertilizer	The Biofertilizer (SNW)
	Privately owned Taiwan industrial enterprise	The Fertilizer producer	Manufacturing Fertilizer (Potash)	The Compound fertilizer (SNW)

4.3.2 Government Agency Actors

The political leaders and the administrators conducting these policies played the most important roles in the success of China's reform. In all six NWs of this study, the government agency actors were found to be playing important roles that have had a particular impact on the building process and outcomes of each NW.

For analysis purposes, the government actors in the NW groups are further classified into two subgroups according to their functional tasks and hierarchical levels: 1) the State and provincial level industrial administrators and 2) Provincial/County /Township level agrotechnical administrators.

4.3.2.1 Central and Provincial Level Industrial Administrators

The Central and provincial level industrial administrators are the industrial ministries and the corresponding industrial bureaus at provincial levels. Three actors of this type were found in the Agrochemicals and Ammonia INWs: MCI and the State broker in the Agrochemicals NW case (see Appendix I, 6-6) and the SOIE broker in the Ammonia NW case (see Appendix I, 5-6).

MCI was the central organ responsible for the administration and development of China's national chemical industry. It governed the national production plans and regulated the chemical products to be produced and imported. MCI was the strategic designer and decision maker at the central level for the creation of the Agrochemicals NW.

The State broker functioned as a local industrial administrator for the State owned chemical industry in Shanghai²². The State broker played a key role between the MCI, different central and local authorities, and the NW partners in the formation of the Agrochemicals NW.

The SOIE broker is a State owned chemical industrial group. As the corporate body of the six member plants, the SOIE broker created the Ammonia NW and managed its ongoing operation.

In addition to the State central and provincial level industrial administrators, another category of government actors identified in the NW groups were the provincial, county and township level agrotechnical administrators as introduced hereafter.

4.3.2.2 Provincial/County/Township Level Agrotechnical Administrators

Local governments at various levels are the executive Bodies of State power and administration, at the corresponding levels. Governors, mayors, heads of counties, districts, townships, and villages assume overall responsibility for local governments at various levels. Accordingly, the lower level government mirrored an administrative structure above them - having most of the corresponding functional units. From the NW groups, six actors belonging to this group were identified: the Agro-tech center in the Compound fertilizer NW (see Appendix I, 3-6), the Science bureau in the Biofertilizer NW (see Appendix I 4-6), the Parent seeds producer and the Seeds reproducer in the Hybrid seeds NW (see Appendix I 1-6), the Science administrator and the Township administrator in the Honeybee NW (see Appendix I 2-6). These actors shown in Table 29 are the functional units administrating rural agricultural science and technology in provincial, county and township governments. This group of actors and their functions in the particular NWs are presented as below:

4.3.2.2.1 Provincial Level Agrotechnical Administrators

The Agro-tech center for the Compound fertilizer NW is a State agrotechnical administrator in Shanghai. His main duties in the NW are the organizational training of product application, providing product information services, and carrying out field experimental demonstrations in the 10 counties around Shanghai.

²² Shanghai, as a city with special prefecture in China, enjoys a provincial level status

4.3.2.2.2 County Level Agrotechnical Administrators

Actors in the NW groups who belong to this category are **the Seeds reproducer** in the Hybrid seeds NW, **the Science administrator** in the Honeybee NW and **the Science bureau** in the Biofertilizer NW. The three actors are the departments in charge of rural agricultural science and technology extension and administration in the Governments of Yichuan, Pinggu and Funan counties. Their roles in the respective NWs are to support the NWs' business operations by primarily organizing the local institutional and individual farmers, and coordinating the activities between the NW partners, users, and relevant regulators in the local areas.

4.3.2.2.3 Township Level Agrotechnical Administrators

The Township government administrators in the NW groups are **the Parent seeds producer** in the Hybrid seeds NW and **the Township administrator** in the Honeybee NW. The main task of these two actors in their NWs are similar to the county agrotechnical administrators, but rather at township levels. Compared to the county administrators they are more operationally linked to the field farming activities and involved with direct economic activities through their other functions, such as distributors of crop protection and fertilizer products in the local towns - as presented in the case descriptions (see appendix I, 1-6 and 2-6).

4.3.3 State Owned Enterprises - SOEs

In the NW groups investigated in this study SOEs represent the majority of actors among all actor groups. Section 4.2.2 showed that this group of actors, in the manufacturing sector in particular, has faced most the turbulent situation during the process of economic reform. In China, SOEs refer broadly to enterprises which are wholly owned by the State. However, for the actors in the NW groups of this dissertation, the term 'SOEs' is used to include several types of institutions belonging to State ownership, each with very different characteristics. For convenient presentation and analysis, it is necessary to have a clear breakdown of the different organizational attributes and activities of various actors. Therefore, the actors in the group of State owned enterprises and organizations in the NW groups of the author's research are further classified into three organizational subgroups: State owned industrial enterprises - the SOIEs, State owned research institutions – the SORIs, and State owned distribution enterprises – SODEs as classified in Table 29. The actors belonging to these three groups are presented in the following sections.

4.3.3.1 State Owned Industrial Enterprises – the SOIE Actors

The State owned industrial enterprises or the SOIE actors are the State owned organizations, which manufacture and supply agrochemical and fertilizer products. According to the data collected, all of the SOIE actors were from the two INWs. The characteristics of this group of actors are generally representative and especially identical to the majority of SOEs in China's agroindustrial sector as described in the introduction part of 4.3.2 of this chapter.

The SOIE actors in the NW groups of this study are **the Fengxian fertilizer plant, the Qingpu fertilizer plant, Nanhui Fertilizer Plant, Chongming Fertilizer Plant, Chuansha Chemical Plant and Pudong Chemical Plant** in the Ammonia NW (see

Appendix I, 5-6) and **the Insecticide producer, the Fungicide producer and the Herbicide producer** in the Agrochemicals NW (see Appendix I, 6-6). The nine SOIE actors from the two INWs are commonly characterized by: 1) manufacturing and supplying of crop protection and fertilizer products under a same administrative system; 2) producing old generic products with outdated technology and facilities; 3) a need capital-intensive revitalization; 4) large workforce; 5) oversupplied market of similar products, and 6) low performances.

Like the actors in the other NWs of this research, the SOIEs in the INWs group undergo a changing process from the previous central planning economy to a market economy. For the enterprise managers the economic reform created both opportunities of direct access to market place and challenges of increasing pressure of competition. Despite the fact that the ongoing reform policy encourages empowering enterprises with more autonomy in determining their own business operation, compared to the actors in other NWs of this research the SOIEs are found in a less self-determined position because each of them is organizationally embedded into the typical traditional hierarchy systems. Another problem faced by this particular group of actors is that initiatives of revitalization would require substantial resource allocation. Table 30 below profiles the SOIE actors.

Table 30: Profile of the State Owned Industrial Enterprise Subgroups

ACTORS IN THE NW CASES	ORIGINAL ACTIVITIES	TECHNOLOGY LEVEL /MARKET POSITION	WORKFORCE HEADCOUNTS	PERFORMANCE
The Fungicide producer	Manufacturing and supplying fungicides	Generic product, old technology, and production process. Low value mature market	From 500 to 1,400 employees	Poor
The Insecticide producer	Manufacturing and supplying mainly organic phosphate based insecticides, chemical products, and dyestuff intermediate			
The Herbicide producer	Formulating and supplying herbicides			
The SOIE broker*	Manufacturing and supplying synthetic ammonia 99.8% and Nitric acid 45%, 68%, 98.2%.	Old product technology and production process. Low value mature market	From 600 to 1,000 employees	Poor
The Marketing center*				
Qingpu fertilizer plant				
The Fengxian fertilizer plant				
NFP - Nanhui Fertilizer Plant				
CFP-Chongming Fertilizer Plant				
CCP- Chuansha Chemical Plant				
PCP-Pudong Chemical Plant				

* The performance indicated refers to the Market center only; it does not apply to the general group performance of the SOIE broker.

4.3.3.2 State Owned Distribution Enterprises – the SODE Actors

The term ‘State Owned Distribution Enterprises’ (or SODE) actors used in this dissertation stands for the State owned institutional actors specialized in purchasing and distributing major agricultural materials such as agrochemicals, fertilizer, field plastic sheet, etc., to further down level distributors and retailers at the users level. **The SODE broker** in the Compound fertilizer NW (see Appendix I 3-6) and in the

Ammonia NW (see Appendix I, 5-6) is a major SOE specialized in the distribution of agricultural products and materials. **The Seeds distributor** in the Hybrid seeds NW specializes in the distribution of various crop seeds. As presented in section 3.3.2.3.2.4 and case descriptions (see Appendix I, 2-6 and 4-6) with the rapid development of China's economic reform and the gradual fading away of their previous monopoly status the SODE actors, like other former central planning players, have to fight their own way to survive economically. To maintain his market position the SODE broker actively pursues the stabilization of key product supply sources and, at the same time, tries to broaden his business activities with new products. The Seeds distributor has, in many ways, experienced a similar situation like the SODE broker, but with relatively smaller scale operations in the local seeds market. The characteristic of the SODE actor is that they are operating in a process from changing the previous monopoly status to market based competition. Due to past privileges, this group of actors has strong customer networks built at the grass roots market. Their roles in the respective NWs (in addition to the broker role in the case of the SODE broker) are to distribute the NWs' products to the local regional markets through their traditional channels.

4.3.3.3 State Owned Research Institutions – the SORI Actors

There are seven SORIs in the NW groups of this research: **the Seeds broker** in the Hybrid seeds (see Appendix I, 1-6), **the Bee broker** and **the Vegetable researcher** in the Honeybee NW (see Appendix I 2-6); **the Agro-researcher** and **the Chemical engineer** in the Compound fertilizer NW (see Appendix I, 3-6), **the Pomology researcher** in the Biofertilizer NW (see Appendix I, 4-6) and **the Pesticide researcher** in the Agrochemicals NW (see Appendix I, 6-6).

The Seeds broker in the Hybrid seeds NW is an institute specializing in researching hybrid seeds technology. With its breakthrough research success with new hybrid wheat seeds, the Seeds broker has been actively expanding a scale industrialization program of the seeds business. The Seeds broker's ambition is to become an international top player in the R&D and commercialization of hybrid wheat seeds. Another SORI actor who plays a broker role is **the Bee broker** in the Honeybee NW, a technical service institution with proprietary of honeybee pollination technology and an influential image in the bee industry. Both actors play technical roles in the respective NWs in addition to act as brokers.

The Vegetable researcher specializes in research of new varieties of vegetables. During recent years, it has successfully bred dozens of excellent vegetable varieties. In the Honeybee NW, the Vegetable researcher provides vegetable field and technical service for the pollination operation.

The Agro-researcher is one of the top research institutions in agricultural science in China and is responsible for the product management of the mixed compound fertilizer in the Compound fertilizer NW.

The Chemical engineer focuses on research and development of process technology and completes existing engineering projects of phosphate chemicals and fertilizer. The center's role in the Compound fertilizer NW is to design and install the production facilities and process future improvements as well.

The Pomology researcher in the Biofertilizer NW is an important institute in the field of pomology research in the western part of China which undertakes a number of State assigned projects. The institute was invited into the NW mainly for providing technical training support to the fruit growers in the targeted market.

Finally, **the Pesticide researcher** is the only SORI actor in the Agrochemicals NW. This institute specializes in the researching of chemical pesticides, bio-pesticides, and fine chemicals, enjoying a renowned position in the field at home and abroad for its achievements of great number of research projects. The Pesticide researcher's tasks in the Agrochemicals NW focuses on the research and development of new varieties of pesticides for the NW.

As introduced in section 4.2.2, since 1998 new State policies encouraged the SORIs to take initiatives of engaging in market activities and generating sources of finance rather than relying solely on State funding. Under these circumstances, the economic dimension becomes a new challenge, pressuring SORI actors who are not normally as familiar with market practice and management of business operations as compared to the business actors. On the other hand, research actors have also found themselves increasingly welcomed by enterprises hungering for new technology and products.

4.3.4 Privately Owned Enterprises – the POE Actors

Having discussed government agency actors and SOE actors, the light is now shed on the final group of actors in this section - the non-State owned, or POE, actors.

As presented in 4.2.1.1.3 one of the important outcomes of market-oriented reforms in China over the past 20 years or so is the emergence of a significant private sector which now accounts for about one third of gross domestic product and is officially recognized as an important component of the economy. According to data collected the POE actors were found playing active roles in the NW groups of this study as well.

Four POE actors were interviewed from three NWs, the Beekeepers association in the Honeybee NW (see Appendix I 2-6), the Fertilizer producer in the Compound fertilizer NW (see Appendix I 3-6), and the POE broker and the Biofertilizer distributor in the Biofertilizer NW (see Appendix I 4-6). These actors are further classified into four types according to their organizational nature and business activities as shown in Table 29.

The Beekeepers association in the Honeybee NW is collectively sponsored by the private apiculturists. The task of the association is to assist the members developing their business by searching new technical information, arranging purchasing, exporting channels of the bee products, lobbying local government for favorable policies for beekeepers, and coordinating their technical and commercial activities. The Beekeepers association provides all the honeybee colonies required for the pollination field operations carried out by the NW.

The Fertilizer producer in the Compound fertilizer NW is a Taiwanese invested manufacturer producing one of the primary nutrients - sulphate of potash (SOP) with ISO9002 and ISO14001 certification standards. The Fertilizer producer's contribution to the Compound fertilizer NW is to manage the production process and ensure the product quality.

The POE broker in the Biofertilizer NW is a small, privately owned firm specialized in manufacturing and supplying biological bacteria fertilizer - fermented by the biotechnology of nitrogen fixation. The producer positioned itself as ecology friendly and sustainable agriculture supporter and adhered to a green image focusing on only biotechnological products. In addition to his functional role as producer, he also plays a broker role in the NW. Another POE actor in the NW is **the Biofertilizer**

distributor, a small privately owned business in Yichuan County which deals with agrochemical, fertilizer, and some farming equipment. The owner, Mr. Wu (a civil servant who worked for many years in the local government) has profound experience in the local agribusiness operation; his role in the NW was to distribute the biofertilizer products to the local apple growing market.

Having presented the present status of the actors in the NW groups, the next section provides some tendencies observed during the data collection process from the actors in relation to their future development.

4.3.5 Transitional Aspects of the Actors

This section presents some trajectory tendencies reflected by the actors as observed during interviews. Further analysis on the actor's behavior in relation to the NW building process will be presented in the later section 4.7.3.3. As presented in section 4.2, several external factors in China's transitional economic reform process have influenced the actors' strategic conduct in relation to their participation of NW form cooperation. As the reform process and the impact of various external factors to the actors' behavior continue, the actors' objectives and interests may also change or develop as each NW evolves into new phases. Consequently, the relationships between the NW participants are possibly rearranged as well.

Among these external environmental factors, for example: deregulation, (as previously discussed), is a dominant process affecting the activities of most of the actors in the NW groups. The transition from the former central planning system to a market economy has been enhancing the breaking up of the industries in the agribusiness sector into different markets. Many SOE actors during the reforming process were transferred into a holding structure like the actors belonging to the INWs group, and later may well be broken up into individual firms with specific ownerships. For these SOE actors, the INW organizational form serves as a transitional vehicle from big conglomerates to smaller and individual firms. In the case of the Ammonia NW, the new steps of reform to be taken would be toward a direction of reforming the group units into individual firms owned by diversified shareholders – as was expected by the managers interviewed.

Another possible trajectory is that since the individual actors first cooperated with a relatively loose-coupled relationship in a NW structure, they may later merge into one company or a new structure with tighter relationships between the participants. The actors have typically demonstrated that such tendencies are from the two DNWs. With further expansion of the businesses in both Hybrid seeds and Honeybee NWs, actors such as the Parent seeds producer in the Hybrid seeds NW and the Township administrator in the Honeybee NW have all explicitly expressed their wishes to transform the present relationships into tighter arrangements. Additionally, the Seeds reproducer in the Hybrid seeds NW also indicated that the overall strategic expansion of the business would, accordingly, requires adequate management capabilities. He suggested that both government and research actors would be no longer suitable for the managerial roles demanded. Consequently, managers with professional business qualifications would be required for the playing roles of managing expanded NW operation.

In the case of the Compound fertilizer NW, the change of actors' roles was already arranged during the formation phase. The SODE broker pulled back from the present

operational management role to the strategic leadership role of board of directors along with assuming a functional role of distribution. Thus, the Fertilizer producer became a co-lead operator. The same tendencies were observed from the Seeds reproducer in the Hybrid seeds NW and the Agro-tech center in the Compound fertilizer NW as well.

Finally, in the Biofertilizer NW, data collected showed that participants are in the process of tightening up their relationships by a more formalized contractual arrangement. The Science bureau likely remains as a supporter. The Pomology researcher may need to enrich his role, in terms of value adding contributions to the NW, because previous technical promotion roles were well performed by the other three partners without the Pomology researcher's presence. Furthermore, the clearly expressed intention of expanding the business beyond the Yichuan market by the POE broker and the Biofertilizer distributor, would mean an emergence of a new set of relationships - leading to possible a redistribution of power and roles among the actors. The trajectory developmental aspects of the NW actors are to be resumed in section 4.7.3.3 by analyzing the evidences collected from the interviewing questions dealing primarily with the transtage phase of the NW building process.

To conclude this section, three types of actors - **Government administrative actors**, **SOE actors**, and **POE actors** - were identified in the NW groups investigated. Within each group of actor types, further classification into subgroups was made according to their organizational characteristics and original activities.

The general characteristics of the operational style of the government actors at strategic levels such as MCI, the State broker, and the SOIE broker were vertically and hierarchically oriented.

Among the SOE actors, the SOIEs faced a situation of both opportunities and challenges - namely, the opportunity of direct access to markets and the challenges of the increased pressure of market competition and resources constraints. To achieve an overall revitalization, apart from the ongoing process of enterprise reforming on structures and systems, improving managers' managerial styles and their strategic and operational capabilities should be prioritized. The SODE actors, on one hand, lost their previous monopoly status and have to compete in the open market as everyone else. However, on the other hand, they have chances to develop businesses in other provinces and regions, since the previous geographical restrictions were broken up. The SODEs have taken new strategic initiatives for stabilizing their supplying sources by pursuing NW form cooperation. The SORI actors are increasingly welcomed by enterprises for their new technology and products. The new policy has brought opportunities of gaining income based on their knowledge resources - though this challenges those who are not familiar with market activities and business management.

The POE actors are found playing active roles in the NW groups of this research. This is in confirmation with the outcomes of the market-oriented reforms that enabled the emergence of a significant private sector accounting for about a third of gross domestic product, and is officially recognized as an important component of the economy.

Virtually **all types of actors in the NW groups have played broker's roles**. - MCI, the State broker and the SOIE broker (State industrial administrators); the SODE broker (the SODE actor); the Insecticide producer and the Market center (the SOIE

actors); the Seeds broker and the Bee broker (the SORI actors) and the POE broker (the POE actor).

Among the NW groups investigated in this research, considerable differences were found between the NW participants in DNWs and SNWs - in terms of sizes, resources, activities, and ownership of the actors. Once formed into a NW constellation these differences attributed to the NW partners, particularly the different resources, fit complementarily to each others' and the NW's overall needs – as is presented in section 4.2. Complementary resources were favored elements for cooperation by all actors in the NW groups. This, however, would require the brokers to have a broader scope of knowledge, experience and skills, and network of contacts from different business fields.

4.4 OBJECTIVES OF ACTORS AND NETWORKS

The first research question of this dissertation is “*why do firms form strategic NWs in the agribusiness sector in the context of the transitional Chinese economy?*” This section is specifically dedicated to the topic of the actors' objectives in forming NW form cooperation. For this purpose, question 2 of the interview guide was used to ask the respondents “*Which of the following factors motivated you to form/join this cooperative arrangement?*” (Refer to question 2 of the interview guide to see a list of 17 motivation factors that was presented to the group of respondents). Appendices III – XI present and summarize data obtained on the topic.

Data collected through question 2 revealed that the majority of the informants interviewed responded that the most important factors which motivated them to pursue the NW form cooperation were “**responding to a growth opportunity, improving product quality, and gaining market share position.**” “**Gaining organizational flexibility through changing ownership structure, a step towards diversification/ expansion, access new sales or export channels and sharing R&D, HR, marketing costs, and expenses with partners**” were also considered important motivating factors by the actors in the NW groups.

Due to diverse attributes of the actors in the NW groups, as presented in the preceding - section 4.3, each type of actor may have a different set of motives and objectives in relation to their decisions on NW formation. Under such circumstances, randomly calculating the scores on all responses obtained from the survey questionnaire may not adequately reflect the individual objectives of each different type of actor. For example, the three types of State owned actors, though in the same SOE group, may very well have different concerns and, therefore, motives and objectives in relation to the NW cooperation. Consequently, this section is processed in two parts. Section 4.4.1, 4.4.2, and 4.4.3 focus on examining the individual objectives of each actor by actor groups as classified in section 4.3. Then follows section 4.4.4, which integrates the results of the actor groups into the formation of each NW, thus, establishing links between the objectives of the individual actors and the common objectives of the NWs.

4.4.1 Objectives of the Government Agency Actors

The eight informants in the Government actors group responded to question 2 that for them, the most important motives to form the NWs were “**responding to a growth opportunity**” and “**improving product quality**.” Table 31 summarizes the individual objectives of the government actors in the different NW groups.

Table 31: Individual Organizational Objectives of the Government Actors

ACTORS		OBJECTIVES	NWS
GOVERNMENT AGENCY ACTORS	Central/ provincial level ²³		
	MCI	Strategic upgrading of the national agrochemical synthetic capability Revitalizing the SOEs economically Establish South pesticide Syntheses center within the Agrochemicals NW	The Agrochemicals NW
	The State broker The SOIE broker	Developing Shanghai chemical industry Creating employment opportunities	The Agrochemicals NW The Ammonia NW
GOVERNMENT AGENCY ACTORS	Provincial/ County/ Township level		
	The Agro-tech center The Parent seeds producer The Seeds reproducer The Seeds distributor The Science administrator The Township administrator The Science bureau	Developing science and technology in rural areas Developing rural agricultural economy Creating employment opportunities for rural population Incentives of engaging in economic activities	The Compound fertilizer NW The Agrochemicals NW The Hybrid seeds NW The Honeybee NW The Biofertilizer NW

As introduced in the case description, (see Appendix I, 6-6) the decision of forming the Agrochemicals NW by MCI resulted from a strategic move of upgrading the capability of the nation’s pesticide synthesis technology, to therefore meet the surging market demand for agrochemical products with high efficacy and environmental acceptance standards. At the State broker level - according to the data collected - in addition to the central strategic dimension, the efforts in pursuing the project were also driven by the attraction of an allocation of a five hundred million RMB fund from the central government for establishing the Center inside the Agrochemicals NW. The government administrators at lower levels – the Agro-tech center, the Parent seeds producer, the Seeds reproducer, the Seeds distributor, the Science administrator and the Township administrator, and the Science bureau - recognized the growth opportunities fostered by the business potential of the NWs in relation to the economic development of their respective places of jurisdiction. For this group of actors there is an additional dimension - the *incentives* of being involved in economic activities in the wake of the policy change, as was explained in the preceding sections 4.2 and 4.3.

The second motivating factor - *improving product quality* can be explained by the fact that the majority of Chinese pesticide and fertilizer producers, especially at county and township levels, have long been operating mainly on the comparative advantage of low labor cost, with inadequate efforts made on the product quality. By experiencing increased competition and the overall development of the country’s

²³ The objectives of the Central and provincial government administrators reflected their overall strategic direction. The objectives of the Agrochemicals and Ammonia NWs were parts of their overall missions.

economic environment, the industrial administrators and enterprise managers have realized the fact that product competitiveness does not mean only offering market a low price. Managers become increasingly aware of the reality that high quality is the key to succeed, and even to survive. Under the circumstances, overall improvement of quality on product and services are called on as major tasks in enterprises. The two motivating factors are directly linked with the functions of the agrotechnical administrators at grass roots level in relation to the rural development of science and technology and development of the rural agricultural economy.

4.4.2 Objectives of the State Owned Enterprises – the SOE Actors

The SOE actors have also considered **“responding to a growth opportunity”** and **“improving product quality”** as their primary motives to forming the NWs. In addition to the similar explanations of the above two motivation factors by the government actors, the respondents representing the three groups of SOE actors – the SOIEs, the SODEs and the SORIs in the NW groups - also have their specific reasons in relation to their forming NW alliances.

All SOIEs actors in the two INWs responded that **“decision of the superiors and requirement by the State owners”** was the most important factor which *“decided and formed”* the two INWs. As presented in the case description of the two INWs (see Appendix I, 5-6 and 6-6), the background information of the top-down formation process, revealed by the key informants interviewed, confirmed that the central and provincial industrial administrators strategically drove the objectives of the formation of the Agrochemicals and Ammonia INWs.

Another important factor for the SOIEs and the SODEs was **“gaining market share position.”** This is explained by their strategy of combining the similarity of activities into powerful supply positions in the Agrochemicals and Ammonia INWs. **“A chance to survive”** was also acknowledged as an important factor by actors in both INWs - showing that SOIEs pressures have impacted their objectives in forming NWs. **“Access new sales or export channels”** reflected an operational urgency of the SOIE actor’s wish to pursue the Agrochemicals NW. **“Gaining organizational flexibility through changing ownership structure”** was hoped for by the SOIEs in the two INWs as a step towards gaining autonomy through restructuring the SOE system into multi-shareholding firms. **“A step towards diversification and expansion”** was also considered as an important reason by the SODE broker in the Compound fertilizer NW - explaining his strategy of stabilizing and searching for new product supply sources.

In the case of the SORI actors, contrary to the situation of the SOIEs, the factors of the **superior’s decision** were regarded as unimportant. Informants from the Seeds broker, the Bee broker, the Vegetable researchers in the Hybrid seeds and the Honeybee NWs, the Pesticide researcher in the Agrochemicals NW, the Agro-researcher, and the Chemical engineer in the Compound fertilizer NW all expressed that their participation in the respective NW cooperation was primarily **“responding to a growth opportunity.”**

For the SORIs the research activities remained as priority tasks. It was observed during the interview that some of the actors belong to this group, like the Agro-researcher and the Chemical engineer in the Compound fertilizer NW, treated their business involvement in the NW (at least for the time being) as an experimental

activity. This attitude is somewhat linked with **learning**, and the objectives of this group of actors in forming the NWs tends to be long term oriented, therefore less pressured for short-term gain. Table 32 summarizes the motivations and objectives of the SOE actors in the different NW groups.

Table 32: Individual Organizational Objectives of the SOE Actors

ACTORS			OBJECTIVES	NWS
SOE ACTORS (State owned enterprises/ organizations)	SOIEs / SODEs	The Insecticide producer The Fungicide producer The Herbicide producer The SOIE broker The Marketing center The Fengxian fertilizer plant The Qingpu fertilizer plant CCP /CFP/NFP/ PCP	Revitalizing the SOEs economically Creating employment opportunities for SOE workers	The Agrochemicals NW The Ammonia NW
		The SODE broker The Seeds distributor	Maintaining leading position in distribution of agricultural means /products	The Compound fertilizer NW The Hybrid seeds NW The Honeybee NW
	SORIs	The Seeds broker The Bee broker The Vegetable researcher The Agro-researcher, The Chemical engineer The Pomology researcher The Pesticide researcher	Achieving economic benefits by commercializing proprietary technologies Becoming research based business firms	The Hybrid seeds NW The Agrochemicals NW The Ammonia NW The Honeybee NW

4.4.3 Objectives of the Private Owned Enterprises - the POE Actors

Data collected from question 2 shows that **“Responding to a growth opportunity”** was the most important factor that motivated all POE actors in this study in their decision of forming NW alliances with other Government agencies and SOE actors. The second most important factor was **“gaining market share position.”** The POE broker and the Biofertilizer distributor formed an alliance with a government agency in order to establish a strategic position in the Yichuan Apple growing market. The Beekeepers association’s interests of capturing the bee pollination business, driven by the growing rural farming operation and the Fertilizer producer’s expansion in the new mixed compound fertilizer business via partnership with other SOE partners in the SNW, all explained the importance of the above two factors which motivated them to form or join the respective NWs.

Despite the rapid development of the private enterprise sector, many of them (especially small ones in the NW groups of this study - as introduced in 4.3) are short of necessary resources for their business development. Hence, the motivating factor **“sharing R&D, HR, marketing costs and expenses with partners”** is of a particular importance to this group of actors. Promotion of agrochemical products is a very costly activity because of the extensive customer education and field trials required at different influencer and user levels. Both the POE broker and the Biofertilizer distributor are small businesses with financial constraints in carrying out large-scale

marketing operations in the remote rural market. By establishing cooperative partnerships with a local government agency, the Science bureau (which is influential among the local users) provides a solution to this problem. In the case of the other two POE actors, the Beekeepers association (as an association collectively owned by the private beekeepers) and the Fertilizer producer (a privately owned Taiwanese manufacturer) by joining their respective NWs, substantially reduced cost through sharing with other NW partners who have the needed types of facilities and resources which otherwise would have to be reinvested. Table 33 summarizes the motivations and objectives of the POE actors in the different NW groups.

Table 33: Individual Organizational Objectives of the POE Actors

ACTORS		OBJECTIVES	NWS
NON SOE ACTORS (Private Owned enterprises) POES	The Beekeepers association	Developing business opportunities for the members	The Honeybee NW
	The POE broker	Becoming a major 'green' product player Achieving a leading bio-fertilizer supply position in the Yichuan apple growing market	The Biofertilizer NW
	The Biofertilizer distributor	Developing a sustainable agrochemical distribution business in Yichuan by obtaining reliable products supply sources	
	The Fertilizer producer	Stabilizing product supplying source Expanding into the mixed compound fertilizer business	The Compound fertilizer NW

4.4.4 NW Objectives

Having presented and analyzed the individual motives and objectives of different types of actor groups, in relation to their involvement of NW form cooperation, the focus moves on to the second part of this section: the NW objectives or the common objectives of the NW participants. Consequently, the analytical focus of this subsection shifts from the actor groups to the NWs.

4.4.4.1 The Hybrid Seeds and Honeybee DNWs

The actors in the two DNWs consist of the SORI actors, the SODE actors, and County and Township agrotechnical administrators. Each actor group has distinct objectives out of its own concerns. However, they were commonly motivated by the factors of **“responding to a growth opportunity”** and **“improving product quality.”** The actors recognized the synergies and complementary relationships with each other in the value chain operations of the hybrid seeds business - the same was true for the bee pollination service business. By forming DNWs, each actor contributes his part of a value-adding role to the NW activities, and independently maintained their other commitments - as was the case with the research activities of the SORI actors, public duties of the government agency actors and other products distribution operation of the SODE actor. A common objective could only be effectively achieved by all NW participants' endeavors. Table 34 shows the relationship between the individual

actor's objectives and the common objectives of the Hybrid seeds and Honeybee DNWs.

Table 34: Individual Actors' Objectives vs. NW Objectives in the Hybrid seeds and Honeybee DNWs

NWs	ACTORS	INDIVIDUAL ORGANIZATIONAL OBJECTIVES	COMMON INTERESTS TO FORM NWs	NW OBJECTIVES SET BY THE BROKERS/ MEMBERS
The Hybrid seeds NW	The Seeds broker	- Achieving economic benefits by commercializing proprietary technologies - Becoming a research based business firm operating at both domestic/ international seeds market	- Responding to growth opportunity - Improving product quality - Incentives of engaging in economic activities - Learning - Gaining market share - Reducing market uncertainty - Sharing cost	Through combining the complementary resources and competences of the different NW participants in a loosely coupling cooperative system, to jointly achieve successful results which satisfy each participant's individual objectives
	The Parent seeds producer The Seeds reproducer	- Developing science and technology for the rural agriculture /economy - Creating employment opportunities for rural population		
	The Seeds distributor	Maintaining leading position in distribution of agricultural means /products		
The Honeybee NW	The Bee broker The Vegetable researcher	Same as the Parent seeds producer and the Seeds reproducer in the Hybrid seeds NW	- Reducing market uncertainty - Sharing cost	
	The Science administrator The Township administrator	Same as the Seeds broker in the Hybrid seeds NW (but focusing on the domestic market)		
	The Beekeepers association	Developing more business opportunities for the members		

4.4.4.2 The Compound Fertilizer and Biofertilizer SNWs

As presented in section 4.3, there are four types of actors in the SNWs group: the SODE, the SORIs, the POEs and government agency actors at provincial, county, and township levels. Same situation can be seen in the DNWs, where the actors in this group were motivated mainly by the factors of **“responding to a growth opportunity”** and **“improving product quality.”** Along the value chain process of production, promotion, supply, and distribution of mixed compound fertilizer in the Compound fertilizer NW and biofertilizer in the Biofertilizer NW, the actors found that each of their own concerns and objectives was complemented by the common

NW objectives. Table 35 illustrates the relationships between individual actor's objectives and their commonalities in the Compound fertilizer and the Biofertilizer SNWs.

Table 35: Individual Actor's Objectives vs. NW Objectives in the Compound fertilizer and the Biofertilizer SNWs

NWs	ACTORS	INDIVIDUAL ORGANIZATIONAL OBJECTIVES	COMMON INTERESTS TO FORM NWs	NW OBJECTIVES SET BY THE BROKERS/ MEMBERS
The Compound fertilizer NW	The SODE broker	- Maintaining leading position in distribution of agricultural materials/products - Stabilizing product supply sources	- Responding to growth opportunity - Improving product quality - A chance to survive - Gaining market share - Gaining organizational flexibility	Through combining the complementary resources and competences of the different NW participants in a relative stable operational process, to jointly achieve successful results which satisfy each participant's individual objectives
	The Agro-researcher	- Achieving economic benefits by commercializing proprietary technologies - Becoming research based business firms		
	The Agro-tech center	Developing science and technology for the rural agriculture /economy		
	The Fertilizer producer	Expanding into the mixed compound fertilizer business		
	The Chemical engineer	- Achieving economic benefits by commercializing proprietary technologies - Becoming research based business firms		
The Biofertilizer NW	The POE broker	Achieving a leading biofertilizer supply position in the Yichuan apple growing market	- Incentives of engaging in economic activities - Sharing R&D, HR, marketing costs expenses with partners - Learning	
	The Biofertilizer distributor	Developing a sustainable agrochemical business in Yichuan by obtaining reliable products supply		
	The Science bureau	Same as the Agro-tech center Creating employment opportunities for rural population		
	The Pomology researcher	Same as the Agro-researcher		

4.4.4.3 The Agrochemicals and Ammonia INWs

Data collected through question 2 and the case descriptions (see Appendix I, 5-6 and 6-6) showed that the primary cause of the formation of the Agrochemicals and Ammonia INWs were the result of **the decisions of the central and local industrial administrators**. The objective of the Agrochemicals NW as determined by the central authorities was to gain a **strategic position** by establishing a research based and marketing oriented agrochemical conglomerate. With this objective, the Agrochemicals NW was given a mission to develop one of the important research centers and a full-fledged agrochemical giant in the Asia Pacific region.

In the Ammonia NW case, the objective set by the SOIE broker was to create a relatively unified supply position, stopping the disorderly competition among the six fertilizer plants, and to standardize operation by coordinating their activities into a cooperation of sharing resources. Externally, the new organizations were expected to

coordinate relationships between the plants and distributors for a better cooperation of supply and demand ties.

During the survey process the NW members expressed different views toward the building process of the two INWs, which are to be presented in the subsequent sections of this chapter. As far as the organizational objectives are concerned, the individual objectives of the SOIE actors in the two INWs principally and theoretically fall into the framework of the overall strategic objectives. Table 36 illustrates the relationship between the individual actors' objectives and the objectives of the Agrochemicals and Ammonia INWs.

Table 36: Individual Actors' Objectives vs. NW Objectives in the Agrochemicals and the Ammonia INWs

NW _s	ACTORS	INDIVIDUAL ORGANIZATIONAL OBJECTIVES	COMMON INTERESTS TO FORM NW _s	NW OBJECTIVES SET BY THE BROKERS
The Agrochemicals NW	MCI	Strategic upgrading of the national agrochemical synthetic capability	To modernize China’s national chemical industry	To gain a strategic position by establishing a research-based and marketing-oriented agrochemical conglomerate
	The State broker	- Developing Shanghai chemical industry - Establish South pesticide Syntheses center within the Agrochemicals NW - To obtain State financial support	To modernize Shanghai’s chemical industry	
	The Herbicide producer	Revitalizing the SOEs economically Creating employment opportunities for SOE workers	- Decisions of the central and local industrial administrators - A chance to survive	
	The Insecticide producer			
	The Fungicide producer			
	The Pesticide researcher	- Achieving economic benefits by commercializing proprietary technologies - Becoming a research based business firm	- Access financial resources - Gaining market share	
The Ammonia NW	The SOIE broker	Same as the actors in the Agrochemicals NW	- Responding to growth opportunity - Improving product quality	To centrally coordinate the marketing activities of the six fertilizer producers
	The Market Center			
	The Fengxia and Qingpu fertilizer plants			
	NFP/CFP CCP/PCP			

To summarize this section, data collected through question 2 demonstrated the individual organizational objectives of the different types of actor groups in relation to their motives to the formation of NW cooperation (see Appendices III - XI). Nearly all NW actors were commonly motivated by the factors of **“responding to a growth opportunity.”** This reflects the dynamic economic situation originated by China economic reform. Another factor was **“improving product quality”** which was

regarded as a matter of surviving from the increasingly severe competition and became the specific concerns to different actors in the NW groups. In addition to general factors, different actor groups also demonstrated their specific interests and concerns. Nevertheless, two types of integration of these individual organizational objectives into the overall NW objectives were processed from the outset of the NW formations. First, the Government initiated NW formation of the Agrochemicals and the Ammonia INWs. **“Decision of the superiors”** was the primary reason for the creation of the two NWs. Therefore, the actors in the two INWs had no choice but to follow the objectives set by the superior organizations. Second, the market initiated NWs groups. The formation of the Hybrid seeds, the Honeybee NWs, the Compound fertilizer, and the Biofertilizer SNWs were all primarily motivated by the factors of **“responding to a growth opportunity”** and **“improving product quality.”** Moreover, the forming of the NW cooperative arrangements were entirely the actors’ own decisions.

4.5 RESOURCES

Much literature has explained that resource dependency is an important reason for the organizations to enter into a cooperative arrangement with other partners.

In this dissertation, variable resources are also found to be an important factor to the actors in the NW groups (in relation to their forming NW alliances). Question 6 of the interview guide asked informants interviewed (n=27) about their preferences on the cooperative partners. The results showed that, among the 10 factors, the overwhelming majority of informants interviewed from each NW expressed that they prefer to cooperate with partners who have **“possession of key required resources.”** The calculated results from a five point Likert scale for question 6 showed that the factor has a score of maximum importance (1.67) among all listed factors (refer to question 6 of the interview guide and survey results in Appendix 12).

Given the importance of variable resources, by its theoretical and empirical implications to this dissertation, this section investigates the relationship between resources and the actor’s motives and behaviors in relation to their participation in the NW form cooperative arrangement. Namely: Why did the actors form strategic NWs from the resource point of view? To reach this objective, a two-step analytical process was structured. Section 4.5.1 deals with the topic, in relationship to the actor types, in two dimensions: 1) internal resources, the resources the actors had in their own possession and 2) external resources, the resources needed by the actors to attain their objectives in relation to the formation of alliances and how did they obtained them. The analytical outputs are, afterwards, integrated into each NW in section 4.5.2 - which presents an overview of the resource combination by the participants in the NW groups.

4.5.1 Resource Structure of the Actors

An internal resource in this study refers to the resources owned by the individual actors before the NW creations. External resources, on the other hand, are resources needed by the actors to achieve specific objectives, although they are not in their possession. To illustrate, in the context of the NW participants of this research and before the formation of each NW, the internal resources of the distributors are the external resources sought out by the manufacturers who, in turn, have their internal

resources sought out by the distributors as an external resource. At the same time, both actors are searching for a particular type of resource which is owned only by the researchers - who are likewise searching for the resources owned by the manufacturers and the distributors. In order to attain their respective objectives, as presented in section 4.4, the actors formed the NW alliances with other partners, thus, have acquired these external resources needed for achieving their common objectives. As a NW develops the possibility of new resource needs may emerge. The search for external resources, therefore, continues.

Furthermore, resources - as discussed in this section - include both knowledge resources, such as intellectual property, special talents, skills and capability of achieving particular tasks; and physical resources, which can be financial means and infrastructure, facilities or any tangible assets for making specific products, or conducting services which can be used for exchange and value generating.

4.5.1.1 Government Agency Actors

4.5.1.1.1 Central and Provincial Industrial Administrators

The central and provincial State industrial administrators MCI and the State broker represented the owners of the State assets in the chemical industry. They had the influence to determine allocation and distribution of the industry resources according to the State planning within their jurisdictions. The State owned resources included large and small manufacturing factories, research institutions, information service centers, administrative and infrastructure facilities, and a great number of specialized and general workers. In Shanghai the SOEs of the chemical industry have been changed into a shareholding system, as has happened in many other regions in China. The assets that were previously controlled by the State broker now belong to a large chemical conglomerate, Huayi Chemical Group, as introduced in the case description (see Appendix I, 6-6). The SOIE broker in the Ammonia NW is from one of the branch companies of this group. For the central and provincial industrial administrators, the most desired resources are knowledge resources such as **efficient managerial, marketing and other different types of technological professionals** who can make better use of the existing resources for sake of furthering value creation. Efforts of improvement on these particular aspects can be seen in the increasingly emphasized management development and efficiency building activities through organizing senior executive training programs and the reforming of human resource management.

4.5.1.1.2 Provincial/County/Township Level Agrotechnical Administrators

The agrotechnical administrators operating at provincial, county and township levels, the Agro-tech center, the Science administrator, the Parent seeds producer, the Seeds reproducer, the Science bureau, and the Township administrator are the departments of the local governments administrating State assets at each of their respective places of jurisdiction. For example, by law all of the land in China belongs to the State, and any land use has to be approved by the State land administrative authorities. Farmers and agricultural workers have contractual arrangements with local government agencies for their farming operations. The resources relevant to this study, besides land and basic infrastructure, are their **administrative power** in local jurisdiction or **influence** of local resources allocation.

As local administrators in agricultural science and technology extension, they have strong capabilities in organizing large-scale farming operations at field levels for the activities involving introduction of new technical input as technology or products. The farmers tend to have more trust in official sources when judging a purchase of new technical input promoted by commercial firms, especially those coming from other parts of the county. For the actors belonging to this group, the desirable resources are **new technology and investment projects** that can activate rural economic development. This is directly linked to their duties as the local administrators in agricultural science and technology extension.

In the Hybrid seeds NW case, the Parent seeds producer and the Seeds reproducer entered NW cooperation with the Seeds broker primarily because of new hybrid wheat seeds technology and the good business opportunities created for the local agricultural population.

Similarly - in the Honeybee NW case - the two government actors (the Science administrator and the Township administrator) appreciated the pollination technology which contributed directly to the local economic development of vegetables and fruits growing business. Table 37 indicates the relationship between the internal and external resources of the government agency actors in the NW groups.

Table 37: Resources Structure Attributing to the Government Agency Actors

ACTORS			INTERNAL RESOURCES (Owned by the actors)	EXTERNAL RESOURCES (Searched by the actors)
GOVERNMENT AGENCY ACTORS	Central/provincial level	MCI	- Strategy and policy making authority for the national chemical industrial development - Administrative power of resources allocation and distribution to SOEs	- Efficient managerial, marketing and other various types of technical professionals at strategic and operational levels, who can make better use of the existing resources for further value creation - New technology and high quality technical inputs for the nation's sustainable agriculture industry
		The State broker		
		The SOIE broker		
	Provincial/County/ Township level	The Agro-tech center	- Administrative power in local jurisdiction - Capability of organizing farming population at field levels - Influence of local resources allocation (financial, man power) - Government status (trustworthy image to farmers)	- New technology and investment projects that can activate the rural economic development
		The Parent seeds producer		
		The Seeds reproducer		
		The Seeds distributor		
		The Science administrator		
		The Township administrator		
		The Science bureau		

4.5.1.2 State Owned Enterprises and Organizations – the SOE Actors

Table 38 indicates the relationship between the internal and external resource structures of the three types of SOE actors in the NW groups.

Table 38: Resources Structure Attributing to the SOE Actors

ACTORS			INTERNAL RESOURCES (Owned by the actors)	EXTERNAL RESOURCES (Searched by the actors)
SOE ACTORS (State owned enterprises/ organizations)	SOIES	The Insecticide producer The fungicide producer The Herbicide producer The SOIE broker The Marketing center The Fengxian fertilizer plant The Qingpu fertilizer plant CCP /CFP/NFP/ PCP	▪ Chemical industrial infrastructure and production facilities of agrochemical and fertilizer products ▪ Workforce trained in Chemical industry	Modern management experience/marketing skills New technology, products Financial resources
		The SODE broker	▪ Experience of distribution of agricultural means and products ▪ Access to agro market channels, customer NWs and key materials ▪ State fund for key agricultural materials	New product supply sources
		The Seeds distributor		Expertise of R&D and manufacturing activities Management experience if industrial enterprise Technology New products
	SORIS	The Seeds broker The Bee broker The Vegetable researcher The Agro-researcher, The Chemical engineer The Pomology researcher The Pesticide researcher	▪ Professional research teams and advanced research facilities ▪ State science and technology research institutional status ▪ New technology and products	Experience and Capacity in managing large-scale industrial /commercial business operation Capacity in organizing farming population at field levels Research expenses and new research assignments/ projects Field technology

4.5.1.2.1 State Owned Industrial Enterprises - the SOIE Actors

Under the previous central planning system the SOIEs in the Agrochemicals and the Ammonia NWs were merely supply bases of pesticides and fertilizer to the SODEs. The internal resources of the SOIEs were mainly the chemical **industrial infrastructure and production facilities** of agrochemical and fertilizer products and its trained **workforce** in chemical industry.

Data collected showed that, to many SOIEs, the most needed resources were **new technology and new products**. Besides, general resource problems are often related to **financial constraints** which, for example, are reflected in the Agrochemicals NW case (see Appendix I, 6-6) in relation to the State broker's efforts for fund allocation from the central government. For the Ammonia NW financial resources are needed for covering inventory during low-sale seasons and readjusting business structure and directions of member firms.

According to the survey results obtained from interviewing key informants from the two INWs, the most important resources needed by the SOIEs actors are, in fact, the same as their superiors - but more at an operational level. For them, it means they need efficient managerial, marketing, and other various types of technical professionals who can make better use of the existing resources for further value creation.

4.5.1.2.2 State Owned Distribution Enterprises – the SODE Actors

The internal resources attributed to the other two SOEs who specialized in agricultural materials distribution (the SODE broker and the Seeds distributor) are the **experience in distribution** of agricultural means and products, access to agro **market channels**, **customer networks** and **key materials** and access some **State funding** for key agricultural materials. These resources were privileges inherited from the traditional central planning distribution system, as introduced in section 4.2. However, with the exclusive distribution rights of agrochemical products abandoned by the reform, and the increasing competition in the agribusiness market, the SODE actors were required to adjust their approaches for each different type of resource needed. In order to realize his strategy of establishing a stable supply base of mixed compound fertilizer, the SODE broker had to search for the type of competences which he did not possess by himself from the other partners who had expertise in **R&D** and **manufacturing activities**, industrial enterprise **management experience**, as well as **technology** and **new products**. In the Seeds distributor case, the SODE actor in the Hybrid seeds NW also accumulated substantial experience and expertise in conducting field trials and technical demonstrations of new seed variety - very important for the special nature of seeds business. The most desirable resource for the Seeds distributor was to have stable supply sources of **high quality seeds**.

4.5.1.2.3 State Owned Research Organizations - the SORI Actors

The primary internal resources of the SORI actors in the NW groups were **professional research teams** and **advanced research facilities**. With long-time State's support, the SORIs had developed many excellent research talents who were well trained in conditioned research environments at home and abroad - such as Dr. Zhao and his team as well as many other SORIs investigated in this study. Enterprisers and investors increasingly welcome those SORIs that accomplish good research that result in new-patented technology or new products.

The **prestigious status** of State science and technology research institutions is particularly respected in the agribusiness environment, since science has played an extremely important role in making the Chinese agriculture a success.

With the change of policy, as discussed in section 4.2, research institutions were encouraged to participate in the market economy. However, most of the SORIs were not used to market oriented economic activities, and they generally lacked **experience in managing industrial and commercial operations**. In the Hybrid seeds and Honeybee DNWs, both hybrid seeds production and honeybee pollination technical service businesses required the deployment of a large number of dispersedly located farmers, and such operations are best handled by local government administrators who have influence in their particular counties, towns or villages. Therefore, **capacity in organizing large-scale farming operations** is the type of external resource that the Seeds broker and the Bee broker desired to have in order to achieve their respective objectives. And despite their lack of necessary business operation managerial ability both the Seeds and Bee brokers choose to manage the business operations by themselves at this stage with an intention of developing the managerial resources through learning by doing.

In the Agrochemicals NW case the Pesticide researcher was the only one actor who brought different resources into the NW - namely R&D ability, facilities of pesticides formulation, and synthesis technologies. In the Compound fertilizer NW the Agro-

researcher and the Chemical engineer brought in different technical resources that were needed, rendering the venture possible from its formation to its future development. The Pomology researcher in the Biofertilizer NW, as a renowned research authority in the field of pomology, had a strong technical influence upon the farmers' choice of using biotech fertilizer instead of chemical fertilizer.

4.5.1.3 Privately Owned Enterprises - the POE Actors

Like the above two actor groups presented in the preceding sections, different actors owned different resources and needed different resources in the POEs group. Table 39 indicates the relationship between the internal and external resources of the private actors in the NW groups.

Table 39: Resources Structure Attributing to the POE Actors

ACTORS			INTERNAL RESOURCES (Owned by the actors)	EXTERNAL RESOURCES (Searched by the actors)
POE ACTORS (Private Owned enterprises)	POEs	The Beekeepers association	Apiculturists and bee swarm sources of supplies	Technology and facility of bee pollination Technical status/influence
		The POE broker	Experience, technology and production facilities for manufacturing and marketing of Bio-fertilizer	Financial funds in conducting marketing activities in remote markets
		The Biofertilizer distributor	Social contacts /business NWs in Yichuan County Knowledge and experience of local agrochemical market	New products supply sources
		The Fertilizer producer	Management skills /experience of fertilizer manufacturing activities / production facilities Overseas Chinese status	Knowledge of business development in mainland market Distribution channels

The internal resources of the Beekeepers association in the Hybrid seeds NW were **the professional beekeepers and bee colonies**; in addition, they also had some bee-products-related processing facilities and expertise. The Beekeepers association's internal resources, although, were instrumental to a successful pollination operation. Regardless, had the beekeepers decided to go alone in carrying out the business operation their efforts would have been insufficient because their resources need to be combined with the equally important resources owned by other actors such as the Science administrator, the Township administrator and the Bee broker as explained previously.

In the Biofertilizer NW the POE broker owned a small company with a team of **experienced technicians** running **R&D laboratory** and **production facilities** and a **sales and marketing force** for manufacturing and marketing biofertilizer. To capture business opportunity in a remote market with financial constraints like Yichuan County, the POE broker had to seek resources of **influence and capability** in organizing the dispersedly located farmers from the local government actor - the Science bureau (as was also the case in the Hybrid seeds, Honeybee and Compound fertilizer NWs). Furthermore, the business process required the POE broker to cooperate with the Biofertilizer distributor who had **social contacts** and **business networks** in Yichuan County and **knowledge and experience** of the local agrochemical market. Likewise, the Biofertilizer distributor in order to survive needed to be backed up by **reliable supply sources of high quality products** - and if not from the POE broker, then from someone else. As introduced in section 4.3, the

Fertilizer producer brought **management skills** and **experience of fertilizer manufacturing** activities and **capital** into the Compound fertilizer NW. Along with this the Taiwanese manufacturer's special overseas Chinese **status**²⁴ is was politically useful as well. As a Taiwanese firm member, the Fertilizer producer desired to have **business development capabilities** in a Mainland China environment - getting access to more distribution channels and customer networks for his invested production sites and future growth. Forming the Compound fertilizer NW, obviously, was one way of obtaining these resources.

4.5.2 Resources Distribution in the NW Groups

This section integrates the data treated in section 4.5.1 while presenting an overview of the resources distribution in each NW. Specifically, how did the actors combine their internal resources in each NW?

4.5.2.1 The Hybrid Seeds and Honeybee DNWs

In the Hybrid seeds and Honeybee DNWs, each of the SORI actors, POE actors and Government actors possess different types of resources and competences which were **complementarily** combined in the respective NWs. Table 40 illustrates the relationships between the internal resources brought by each individual actor into the alliance and the needed resources available for sharing in order to achieve their common objectives in the two DNWs.

Table 40: Resources Combination in the Hybrid seeds and Honeybee DNWs

NW ACTORS		INTERNAL RESOURCES (Owned by the actors)	EXTERNAL RESOURCES (Searched by the actors)
The Hybrid Seeds NW	The Seeds broker	New technology and products Professional research teams and advanced research facilities State science and technology research institutional status	Capacity in organizing large-scale farming operations /Field farming technology / Experience and capacity in managing large-scale industrial /commercial business operations
	The Parent seeds producer	Administrative power in local jurisdiction Capability of organizing farming population at field levels /Influence of local resources allocation (financial, manpower) / Government status (trustworthy image to farmers)	New technology and investment projects that can activate the rural economic development
	The Seeds reproducer		
	The Seeds distributor	Specialized license for distributing seeds in Baodi County and nearby areas Extension and technical trial experience of seeds at field level	New product (seeds) supply sources
The Honeybee NW	The Bee broker	Same as SORI actors' resource structure in the Hybrid seeds NW	Same as the SORI actor's resources needs in the Hybrid seeds NW
	The Vegetable researcher		
	The Science administrator	Same as the local Government actor's resources structure in the Hybrid seeds NW	Same as the local Government actor's resources needs in the Hybrid seeds NW
	The Township administrator		
	The Beekeepers association	Apiculturists and sources of bee hive supplies	Technology and facility of bee pollination / Researcher status/influence

²⁴ The Chinese Government has a policy which offers favorable treatments and economic incentives to Chinese living outside the mainland who continue investing and doing business in China. The Chinese from Taiwan are included in this category.

4.5.2.2 The Compound Fertilizer and Biofertilizer SNWs

Similar as in the above two DNWs, the resource structure in the two SNWs were also characterized by their complementarities. **Knowledge, competence and physical resources** for producing, promoting, and distributing the products were complementarily combined by different participants in the two SNWs. Table 41 illustrates the relationships between the internal resources of each individual actor and the needed resources available for sharing to achieve their common objectives in the Compound fertilizer NW and the Biofertilizer SNWs.

Table 41: Resources Combination in the Compound fertilizer and Biofertilizer SNWs

NW ACTORS		INTERNAL RESOURCES (Owned by the actors)	EXTERNAL RESOURCES (Searched by the actors)
The Compound fertilizer NW	The SODE broker	Experience in the distribution of agricultural means and products Access to agro market channels, customer NWs and key materials State funds for key agricultural materials	Expertise in R&D and manufacturing activities Management experience in industrial enterprise Technology Stable new products supply sources
	The Agro-researcher	Professional research teams and advanced research facilities State science and technology research institutional status New technology and products	Research expenses Commercial, business management experiences and market knowledge
	The Chemical engineer		
	The Agro-tech center	Administrative power in local agricultural extension activities Capacity in organizing large-scale farming operations Government status (trustworthy image to farmers)	Commercial, business management experiences and market knowledge
	The fertilizer producer	Management experience in fertilizer manufacturing activities Production facilities Special overseas Chinese status (political assets)	Knowledge and experience in business development in the Mainland market Distribution channels
The Biofertilizer NW	The POE broker	Experience, technology and production facilities for manufacturing and marketing of Bio-fertilizer	Capacity in the conducting of field marketing operations in remote farming regions Finance
	The Science bureau	Same as the local Government actor's resources structure in the Compound fertilizer NW	Same as needs of the local Government actor's resources in the Compound fertilizer NW
	The Biofertilizer distributor	Social contacts /business NWs in Yichuan County Knowledge and experience of local agrochemical market	Stable supplying sources of high quality products
	The Pomology researcher	Same as SORI actors' resource structure in the Compound fertilizer NW	Same as the SORI actor's resources needs in the Compound fertilizer NW

4.5.2.3 The Agrochemicals and Ammonia INWs

The actors in the Agrochemicals NW had a relatively complementary resource combination between the three SOIE actors of different types of pesticide production facilities (herbicide, insecticide and fungicide) and each of them has a large trained chemical workforce. Moreover, a SORI actor brought in R&D capabilities of pesticide production.

However, in the Ammonia NW (compared to the Agrochemicals NW) the picture is completely different. The resource structures attributed to the SOIE actors were identical to each other between the NW participants, and, further, they were dealing with the same oversupplied fertilizer market. Table 42 below illustrates the relationship between the internal resources and external resources of the SOIE actors in the two INWs.

Table 42: Resources combination in the Agrochemicals and Ammonia INWs

NW ACTORS		INTERNAL RESOURCES (Owned by the actors)	EXTERNAL RESOURCES (Searched by the actors)
The Agrochemicals NW	The Insecticide producer The fungicide producer The Herbicide producer	Chemical industrial infrastructure and production facilities of agrochemical products Differentiated product lines (herbicide, fungicide, Insecticide) Workforce trained in Chemical industry	Modern management skills New technology and products Financial resources
	The Pesticide researcher	Professional research teams and advanced research facilities State science and technology research institutional status New technology and products	Research expenses and new research assignments/ projects Commercial, business management experiences and market knowledge Financial resources
The Ammonia NW	The SOIE broker The Marketing center The Fengxian fertilizer plant The Qingpu fertilizer plant CCP /CFP/NFP/ PCP	Chemical industrial infrastructure and production facilities of ammonia fertilizer Similarity or redundant resources structure Trained workforce in Chemical industry	Similar resource needs as the SOIEs in the Agrochemicals NW

The above analysis has shown that two types of resources were combined by the actors in the NW groups, 1) **complementary resources** and 2) **similar resources**.

The actors in the DNWs, the SNWs, and the Agrochemicals NW in the INW group - have resources which are complementary to each other. One of the major reasons for having formed the NW organizations was to share the complementary resources with other partners in order to overcome the hurdle of shortage of desired resources needed for achieving their respective objectives.

Contrary to all, in the Ammonia NW case, the resources attributed to the six SOIE actors were more similar in type, and - moreover - they were badly in need of the same types of external resources which were not available from their partners.

Data collected from questions 10,11 and 12 (member) and 11, 12 and 13 (broker) of the interview guide showed that the overwhelming majority of the informants interviewed in the NW groups were in favor of cooperating with partners who have complementary resource and competence.

Further analysis relating to complementarities versus similarities of resources is presented in section 4.6 - in connection to the actor's activities and relationship pattern. Figure 31 illustrates how the internal resources of the actors were combined in the different types of NWs in the value chain process.

Figure 31: The Resource Combination in the Three Types of NW Groups

NW operation process		Production	Research	Raw materials	Influence	Distribution
DNWs	The Hybrid Seeds NW	Production process knowledge in hybrid seeds brought by SORI and local government actors	Professional research teams, Research facilities, Technology, products and image contributed by the SORI actors	Original seeds purchase from farmers via the government actors	Administrative power in local agricultural extension activities	License for distributing seeds by the SODEs Extension and technical trial experience of seeds at field level
	The Honey bee NW	Operational process knowledge in pollination service /special facilities by SORI		Honeybee colonies sources of supplies by the Beekeepers association	Capacity in organizing large-scale farming operation Government status (trustworthy image to farmers) By the agrotechnical administrators	Organizing field demonstration to the fruit and vegetable farmers by the government actors
SNWs	The Compound fertilizer NW	Management experience in fertilizer and biofertilizer manufacturing activities		Access to key raw materials for producing the compound fertilizer	(Capital, land and technical forces in the DNWs)	Market channels, customer networks and key materials State fund by SODE actor
	The Biofertilizer NW	Production facilities		Biofertilizer producer own procurement system		Business NWs, Knowledge/ experience in local agro market by POE distributor
INWs	The Agrochemicals NW	Chemical industrial infrastructure and production facilities		Centralized purchasing /bargaining power	A strong strategic position in pesticide industry	Own marketing teams/ distribution system
	The Ammonia NW	Production facilities of agrochemicals and fertilizers SOIE actors		Centralized purchasing/ bargaining power	A strategic position /bargaining power of ammonia supply	Coordination with the SODE distributor

The major findings of this section are that, between the two types of resources combined by the actors in the NW groups, the overwhelming majority of informants expressed preference in cooperating with partners who have **“possession of key resources required.”** In addition, most of the actors in the NW groups placed importance on **knowledge types of resources** such as capabilities of strategic and operational management of enterprise, technological expertise, marketing talents as desirable resources.

Having examined the resource aspects of the actors, in relation to their strategic conduct in forming NW alliances, the next section will present the activities and relationship patterns in the NW building process.

4.6 ACTIVITIES AND RELATIONSHIP PATTERNS IN THE NETWORK BUILDING PROCESS

This section focuses on the structural and relational properties of the NW groups. Using Bircher's model (1998) the analytical method is structured into two main aspects: 1) the qualitative "content" of the activities realized in the six NWs and the relations resulting from the nature of these activities, and 2) the formal structure of the relations and the measurement of these relations. Section 4.6.1 presents the type of activities that the actors had combined in the NW form cooperation at formational and developmental phases during the NW building process. Section 4.6.2 presents the similarity and complementarity of combined activities in the NWs and evaluates their advantage and disadvantage aspects. The NW actors' opinions on the different forms of combination of activities and business field are presented. After that, participants' perception towards the subject of risks of losing knowledge in combining activities is examined. Finally, section 4.6.3 describes the formal structure of relations in the NW groups. The formal and informal cooperative arrangement of NWs, loose and tight coupling relationships, and measurements of the relations in the NW groups are presented and analyzed.

4.6.1 The Combined Activities during the NW Building Process

Section 4.3 presented the original activities attributed to each actor. The current focus is to present and analyze the types of activities throughout the NW building process executed by the actors along the value chain concept. To gain a holistic view of the combined activities of the various actors in the NWs, two questions in the interview guide were specifically designed for the brokers in each NW, since they had the most comprehensive information about each actor's activities. Regarding the actors' activities during the NW building process, question 10 consists of 17 items asking each of the NW initiators about the major challenges they faced during the formational phase. Question 23 consists of eight items asking the activities of the brokers during the developmental phase (refer to question 10 and 23 of the interview guide to see the lists of questions that were presented to the group of respondents, and Appendixes XVI-XVII).

4.6.1.1 The Hybrid Seeds and Honeybee DNWs

4.6.1.1.1 Formation Phase

Professor Zhao, the Seeds broker responded to question 10 that "**determining a good business opportunity**" and "**overcoming financial constraints**" were the major activities during the initial formation stage of the Hybrid seeds NW. In order to obtain financing for the start-up stage of the project they had to convince investors of the high performance and potential business prospects of the new hybrid seeds. In the Honeybee NW case Mr. Wang, the Bee broker, stated that the major challenges they had encountered were "**working out a solid business plan and proposal**" and "**convincing potential partners to join the cooperative arrangement,**" which were unfamiliar activities to the research actors. Coupled with this, the Bee broker had to overcome some regulatory barriers that required the researcher to improve his production facilities' condition (refer to Appendix I, 2- 6).

The two DNWs were formed along an evolutionary process of business development whereby the two brokers cooperated with their present partners in the trial field

operation of hybrid seeds and apiculture research activities. After negotiating and agreeing on the principle conditions and arrangements between the partners, the NWs were formed and operational. Since the relationships between the partners were loosely coupled no particular activities or efforts associated with legal arrangements or formalities were involved. Therefore, fewer transaction costs were incurred.

The participants of each NW actively cooperated with the brokers in forming the respective NWs. Data collected from question 4 and 5 showed reactions from the stakeholders to the NW formations. Mr. Xiang, the Seeds reproducer explained: *“the Funan government was very supportive and provided us with the capital, land and technical forces needed for the experimental operation. A deputy governor was especially assigned to be responsible for the operation.”* Mr. Liang, the Parent seeds producer, said the same: *“the Shunyi county government, and Gaoliying Township government and agricultural commission supported the project’s approval and provided capital resources ...local leading officials visited the sites...”* The actors in the Honeybee NW acted with a same enthusiastic way as Mr. Xu, the Township administrator explained: *“we organized farmers to see the field demonstrations and good results. Further promotions were carried out via the local and Beijing TV stations ... at our request, the financial department of the county government provided financial support to the promotion activity.”* Apart from the collaboration of the government actors, and the POE actor, the Beekeepers association also made efforts by actively promoting the benefits of the NW idea to its member beekeepers and lobbied for support from the local County authorities to the formation of the NW alliance.

4.6.1.1.2 Development Phase

Responding to question 23 of the interview guide, Professor Zhao said that **“coordinating relationships among the partners and other stakeholders and strategic leadership of the cooperative activity”** were the most important activities when the NW became operational. This can be explained by reviewing the hybrid wheat seeds business process which consists of three basic set of activities: 1) parent seeds production; 2) hybridizing and reproduction, and 3) marketing finished products to users (including technical promotion activities, field trials). The process started with the Seeds broker instructing the Parent seeds producer about the requirement of the parent seeds production. The Parent seeds producer organized the local farmers visits to field demonstrations and allocated production assignments to the farmer groups via its administrative system. Then the farmers grew the parent seeds according to the Seeds broker’s instructions. The Parent seeds producer monitored the farmer’s operation throughout the entire process. Upon harvest, the Parent seeds producer collected the seeds that met the specified quality standards from the farmers and delivered them to the Seeds broker. The reproduction operation was handled by the Seeds reproducer in Funan County - which was technically supported by the Seeds broker’s local technicians who controlled the crucial parts of the technology and provided training courses to the Seeds reproducer’s technical force. The Seeds reproducer further trained the key contractors who then taught the farmers accordingly. The process continued with the Seeds reproducer then distributing the parent seeds to the contractors and then following up, monitoring and controlling their growth time and observing the wheat blossoming through a three-tier system. At the time of harvest, the Seeds reproducer’s activities included pre-screening and

dispatching samples collected from each grower to be sent to the Seeds broker for quality analysis. Upon acceptance of the samples, the collected seeds were then packaged with the Seeds broker's special bags and then delivered. Finally, the Seeds distributor distributed seeds through his own channels. As a routine activity of the seeds business, the Seeds distributor conducted regular field trials and field demonstrations to his distribution and users networks. During the commercial process, the Seeds broker continued providing technical services to the users under the Seeds distributor's coordination.

The activities executed in the Honeybee NW during the development phase are in many aspects similar to the seeds business process in terms of technical instructions and operators training. Mr. Wang responded to question 23 that, based on his experiences, the most important activity in the development phase was **“strategic leadership of the cooperative activity.”** The Honeybee NW operation process started with the working plan designed by the Bee broker. The Science administrator and the Township administrator, in their respective areas, organized farmers to watch technical demonstrations of bee pollination and then collected orders from the users. Usually, the Bee broker was notified 15-30 days before the operation. Upon receiving the orders, the Bee broker started making arrangements with the Beekeepers association on the specifics of the required bee colonies. Following the instruction, the Beekeepers association prepared bee colonies and then transported them to the field and makes a technical display of the pollinating facilities - according to the Bee broker's instruction. The farmers who requested the service were notified by the Township administrator to receive the treatment in their field at a specified time. The Bee broker's technical team then performed the pollination operation. At the end of flowering season, the bee colonies were then returned. In case some farmers failed to pay after using the service, the Township administrator played an effective role in settling the payments. In addition, Mr. Wang also responded to question 23 that the most important activities for his firm included **“new business development”** (since there was a synergy between the pollination operation and other honeybee related product development and research activities that could be efficiently combined) and **“developing new partner/ members and concentrating on your own core competence”** of pollination technology. Figure 32 summarizes the major activities executed in the value chain processes of the two DNWs.

Figure 32: Major Combined Activities Executed in the Hybrid seeds and Honeybee DNWs

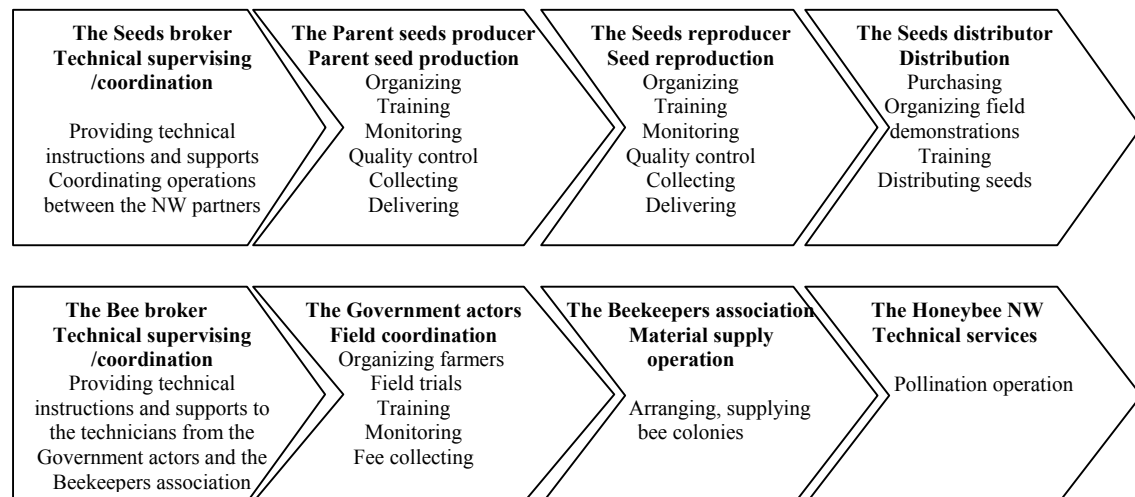


Figure 32 illustrates that in order to achieve the objectives as presented in section 4.4.4.1 several participants operated at each point along the value chain. The Seeds broker and the Bee broker relied on only a limited set of core competencies, mainly technologies of hybrid seeds production and honeybee pollination and special facilities. Each participant of the two DNWs focused on a portion of the value chain and forged relationships with other specialist partners to offer the final seeds and pollination service, which were identical to the operating logic of the DNW linked to the divisional form of organization as introduced in section 2.3.2.3.4.

4.6.1.2 The Compound Fertilizer and Biofertilizer SNWs

4.6.1.2.1 Formation Phase

Responding to question 10 of the interview guide, the brokers from the two SNWs (the SODE broker and the POE broker) commonly deemed **“determining a good business opportunity,” “working out a solid business plan and proposal”** and **“gaining support from the parent organization”** as the most important activities during the formation phase. The SODE broker initiated the cooperation by organizing the potential partners to evaluate the project’s feasibility. With overall positive responses from the participants, the broker then proposed an equity share JV as the cooperative arrangement. This was duly accepted by the potential partners. During the broker-led formation process, the partners agreed on the structure of the equity share participation, worked out a business plan, and clarified their respective responsibility according to each partner’s strengths. During the formation phase the brokers had the task of obtaining business licenses and allocating land for the production site, warehouse, and administrative facilities. The Fertilizer producer’s task was to purchase production equipment and design the production process. The Agro-researcher and the Agro-tech center carried out product trials, technical promotion, and field application. The Chemical engineer took care of the product formulation, quality control, and assisted the Fertilizer producer in installing the production facilities. The activities during the formation phase also included redesigning the cooperative structure with the three SORIs. The most important activities combined by each partner during the NW formation phase were their joint contributions for obtaining governmental approval of the project.

For the POE broker in the Biofertilizer NW, the other three activities listed in question 10 of the interview guide “identifying suitable potential partners, convincing potential partners to join the cooperation and develop personal relationship/contact to the key stakeholders” were important activities during the NW’s formation phase. The situation of the Biofertilizer NW was different from that of the Compound fertilizer NW’s because it did not involve any formal new organizational formation or investment project approval process. The activities of the POE broker were mainly devoted towards establishing relationships and building trust with the key influential government agency. While the relationships were built up at both organizational and individual levels, initial distribution of product was executed and further ties with the Biofertilizer distributor were established. With the basic elements of NW cooperation in place, the broker and his partners started the business operation.

4.6.1.2.2 Development Phase

The SOIE broker from the Compound fertilizer NW and the POE broker from the Biofertilizer NW indicated that **“coordinating relationships among the partners and other stakeholders”** and **“new business development”** were the most important activities of their NWs when they entered into the development stage.

The data collecting process for the Compound fertilizer NW was conducted during July 2001, just four months after the new NW organization was founded. The Compound fertilizer NW was in the process of implementing its plans. The broker, in addition to coordinating the internal and external relations of the NW, prepared for the distribution of the new product. The Fertilizer producer sent a GM who managed all technical operation of the Compound fertilizer NW. The responsibilities of the three SORIs remained as ongoing activities and were seen as increasingly important as the product reached the marketplace.

In the Biofertilizer NW, steps of combined activities were taken to create a strong awareness of the biofertilizer product. This was done by carrying out field promotion activities. The promotion program was first implemented by the Science bureau to assign the task to administrators operating in the township village level – where they would then organize farmers’ education on the scientific management of apple trees. In the farmers’ gatherings, chaired by the Science bureau staffs, the POE broker would present the product, answer farmers’ questions, and distribute technical information leaflets. During the field promotion process the Biofertilizer distributor followed up with parallel actions of making arrangements to collect orders, distribution plans, and logistic procedures along with the POE broker. The three partners conducted such activities in nine out of ten towns - covering more than 100 villages in the Yichuan County. The joint efforts of promotion activities by the three partners generated initial purchases from the farmers, and made the POE broker the first biofertilizer supplier to successfully penetrate the Yichuan market in such a relative short period of time. The three partners continually carried out their combined activities in the after sales service and further development of market shares in the Yichuan County. The major combined activities executed in the two SNWs are illustrated in Figure 33 below.

Figure 33: Combined Activities Executed in the Compound fertilizer and Biofertilizer SNWs

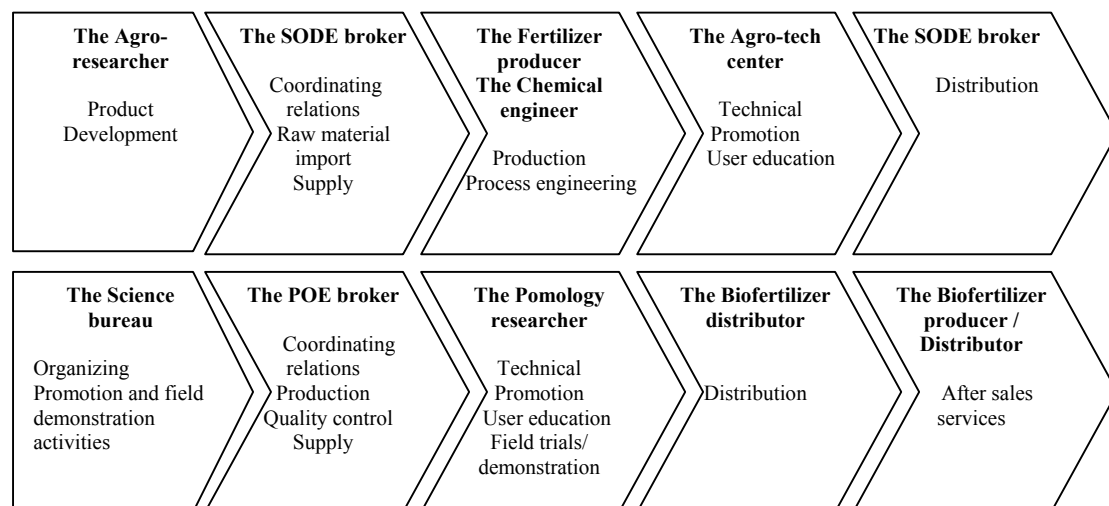


Figure 33 shows that in the two SNWs, the lead firms - the SODE broker and the POE broker - and each of their upstream and downstream partners had knowledge of each other's abilities and were committed to making the entire value chain operate effectively. Data collected showed that there was a strong willingness among the participants throughout the NWs to interact with each other in complementary fashion. In the two NWs, the brokers, instead of employing the vertical integration associated with the traditional functional organizations, outsourced their non-core competencies to their specialist firms in order to increase flexibility throughout the NWs. The operational character of the Compound fertilizer and Biofertilizer NWs corresponds to the operation logic of the centrally coordinated specialization of the SNW - which has its roots in the structure of the functional organization as explained by Miles and Snow (1994) in section 2.3.2.3.4.

4.6.1.3 The Agrochemicals and Ammonia INWs

4.6.1.3.1 Formation Phase

As explained before, both formations of the Agrochemicals and Ammonia INWs were government initiated internal restructuring processes. The establishment of the South Pesticide Synthesis Research Center within the Agrochemicals NW gained strong financial and political supports from the central government. The MCI and the State broker also obtained a special status for the Agrochemicals NW, enjoying all preferential treatment entitled only to firms registered in the special economic development zone. With all of these favorable conditions the broker smoothly formed the Agrochemicals NW in just six months. The vertical decision-making and top down integration process conducted by the State industrial administrators from central to local levels did not involve a process of negotiation, bargaining or compromising amongst various stakeholders. The State broker drove through the entire formation process and appointed the management team of the Agrochemicals NW consisting of the leading members from the four integrated organizations. Mr. Lang, the former president of the Agrochemicals NW, responded to the listed points of question 10 that for him, the major activities during the formation time of the new group was to deal with the problems of relationships between the partners. Some **“potential partners did not trust or dislike other partners”** in the cooperative arrangement, **“conflict of interests”** among some of the potential partners, **“resistance from the key stakeholders”** and individual/personal resistances to join the cooperation **“fearing to loose personal interests.”** At the participants' level, each of them remained their usual routine operations during the formation phase since there were no business interactions among the actors.

The operational challenges in the Agrochemicals NW case largely coincided with the experience of Mr. Liu Min, GM of the Ammonia NW. He faced similar problems of managing the conflict of interests among some of the potential partners as well as resistance from the key stakeholders. As part of an overall top down SOEs restructuring process, the SOIE broker formed the Ammonia NW as a marketing platform company with the six fertilizer producers located in different counties. Mr. Zhou, the SOIE broker, responded in the questionnaire that **“determining a good business opportunity,” “working out a solid business plan and proposal”** and **“gaining support from the parent organization”** were the major activities in connection to the Ammonia NW's formation at his level. The member firms of the

Ammonia NW like the partners in the Agrochemicals NW, simply followed the instructions of the parent organization and played little roles for the NW formation.

4.6.1.3.2 Development Phase

Both brokers, from the INWs, responded to question 23 that by stating that **“coordinating relationships among the partners and other stakeholders”** was the most important activity of their NWs after the organizational formation. In addition, Mr. Zhou considered **“strategic leadership of the cooperative arrangement”** to be an important activity from his position in relation to the Ammonia NW during the development phase.

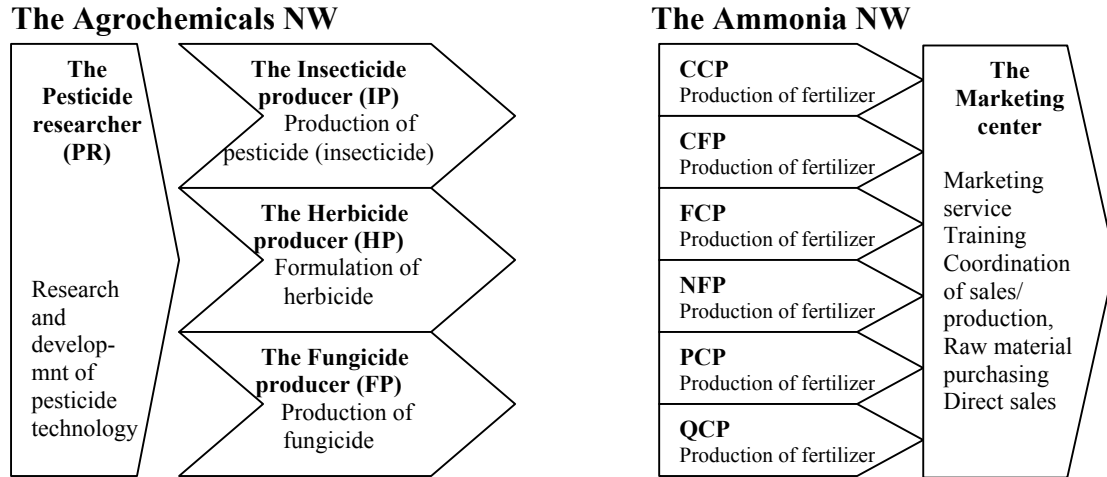
Directed by the State broker, the Agrochemicals NW’s main activities during the development phase included the internal tasks of reforming management systems, restructuring operational process and systems and implementing shareholder system; and external tasks of developing joint R&D and synthesis operations with agrochemical enterprises and research institutions, participating in international research exchange activities and importing technology from abroad. Despite the importance of these tasks many of them, in reality, were not implemented as they were expected. Instead, some harmful occurred which manifested mainly non-cooperative behavior among the partners. This explains why the former president of the Agrochemicals NW responded to question 10 that coping with the problems of relationships between the key partners were the major activities for him starting from the formation phase. The same situation existed in the Ammonia NW as well, according to the GM Mr. Liu. The nature of the non-cooperative activity issue will be analyzed in the coming section dealing with actors’ relationship patterns.

In the Ammonia NW, the initial operation was positive, due to the effective coordinating efforts of the Marketing center on selling prices among the member plants and cooperating with the distributors in the material flow management. However, the remaining oversupply problem of the market and shortage of inventory financing in the plants created difficulties for the NW in its development process. Consequently, a similar situation happened as in the Agrochemicals NW, such as rule-breaking and internal competition among the members. Like his superior’s response to question 23, the GM of the Ammonia NW and Marketing center also felt that his efforts after the NW formation were mainly focused on **“coordinating relationships among the partners and other stakeholders.”** With this, he considered other points in the questionnaire such as **“operational coaching and facilitating the cooperative arrangement, new business development and developing new strategies for the NW members”** to be the important activities in his operation as well. The Marketing center made a deal with distributors for an exclusive distribution of 250,000 tons of fertilizer for the local region, and in exchange the distributor was expected to provide a loan equivalent to 60% of the financial needs for the Ammonia NW’s member plants in the financing of their inventories.

Other activities of the Ammonia NW included developing markets outside of Shanghai for the remaining 250,000 tons of fertilizers by employing sales staff in those markets and providing incentives to the distributors along with cooperating with the upper stream raw material suppliers. To bring down the production volume to an appropriate level, the Marketing center swapped an amount of 50,000 tons of fertilizer to produce a different chemical compounds for the SOIE broker.

Efforts made by the Marketing center also included creating a central marketing research and information system, centralizing raw materials purchasing, providing training support, and introducing new products and business to the members. Figure 34 presents the major combined activities executed in the two INWs.

Figure 34: Combined Activities Executed in the Agrochemicals and Ammonia INWs



IP=the Insecticide producer/HP=the Herbicide producer/FP=the Fungicide producer/PR=the Pesticide researcher / CCP=Chuansha Chemical plant/ CFP=Chongming Fertilizer Plant/FCP=Fengxian Chemical Plant /NFP=Nanhui Fertilizer Plant/PCP=Pudong Chemical Plant/QCP=the Qingpu chemical plant

Existing literature suggests that the logic of the INW requires the creation of a market inside a firm. In the Agrochemicals NW, the internal market arrangements were that the research results of new technologies developed by the Pesticide researcher were to be transferred to the group internally. Furthermore, the three SOIE actors provided toll production services to each other for specific product formulations. In the Ammonia NW the member fertilizer plants could choose to sell their products directly to the market, or through the internal mechanism of the Marketing center.

This section has described the combined activities of the actors in each NW during both formational and developmental phases. The following section presents the analysis on the characteristics of these combined activities in each NW, and their advantages and disadvantages as perceived by the NW participants in the NW groups investigated.

4.6.2 Characteristics of the Combined Activities in the NWs

According to data collected shown in the preceding sections, the actors' activities in the six NWs of this research are combined both in similarity and complementarity.

Questions 10,11 and 12 (member) and 11,12 and 13 (broker) of the interview guide asked the informants about their opinions of the two forms of activity combination in their cooperation with partners coming from a same or different business field. All informants (n=27) interviewed in the NW groups expressed their views on the advantages and disadvantages of the two forms of activity combination. The informants' views and experiences are presented in the following section.

To begin with the analysis, a summary of both similarity and complementarity of combined activities in the NW groups is presented in Table 43.

Table 43: Combination of Activities in the NW Groups

NWs	Combination of activities	COMBINED ACTIVITIES	OBJECTIVES, SYNERGIES
The Ammonia NW	SIMILARITY of combined activities	6 X PRODUCTION/SUPPLY MARKETING	- Cost reduction - Negotiation power of supply/purchasing - Market share position - Technology development - Standardization
The Agrochemicals NW	COMPLEMENTARITY of combined activities	3 X PRODUCTION/SUPPLY (different product lines)+ 1 RESEARCH	- Economies of scale - Complete product lines - Costs reduction - Capacity utilization - R&D integration
The Biofertilizer NW		RESEARCH + PRODUCTION/SUPPLY + DISTRIBUTION + INFLUENCER	- Costs reduction - Fast penetration of new market - Customer satisfaction - Strong marketing
The Compound fertilizer NW		RESEARCH + PRODUCTION/SUPPLY + DISTRIBUTION + INFLUENCER	- Fast penetration of new market - Costs reduction - Customer satisfaction - Strong marketing
The Hybrid Seeds NW		RESEARCH + PRODUCTION/SUPPLY + DISTRIBUTION + INFLUENCER	- Fast penetration of new market - Costs reduction
The Honeybee NW		RESEARCH + PRODUCTION + DISTRIBUTION + INFLUENCER	- Customer satisfaction - Flexible relationship with partners

Adapted from Bruno Bircher (1998) a NW approach to telecommunications-Introduction

4.6.2.1 Similarity NWs – Advantage and Disadvantage

As Table 43 shows, among all NW groups investigated in this research the Ammonia NW was the only alliance where the actors' activities were combined with a complete similarity. The six fertilizer producers manufacture the same type of product and supplied to the same market territory. The advantages of combining the similar activities in a NW according to Mr. Zhou, the SOIE broker, were: **“gaining a strong market share position, cost reduction on raw materials, improving technology of a particular product, prolonging the product life cycle, strengthening after sales service in the same product category and sharing resources.”** On the other hand, he also pointed out that combining similar activities within the group has disadvantages of **high cost in coordinating several internal firms, redundancy of the senior managers, and potential competition** between the members who are doing same things. Finally, he thinks that firms conducting similar activities are also less innovative.

Mr. Tian Xiao, manager of the Fengxian fertilizer plant, believed that cooperation between partners in the same field has the advantage of **information sharing, price coordination**, and that it further advantageous because it can become a united **negotiation power**. He thinks that **disclosure of commercial secrets** may be a disadvantage for similarity cooperation. Mr. Zhu, manager of Qingpu fertilizer plant, was concerned about the existence of potential competitive elements between the partners (in their combined similar activities) that could lead to unwanted future consolidation – ‘big fish eats small fish’.

Informants from the Agrochemicals NW also have different opinions about the advantage and disadvantages of the subject. Mr. Gao, deputy secretary general of the CNPA and former deputy director of the Agrochemicals, NW said: *“...cooperation between parties from a same field makes it easier to reach agreement on technical and market matters, but can also narrow down knowledge scope - which is not good for development. Cooperation between the partners from the same field can develop the size of the enterprise and save management and operational cost.”*

Professor Zhou, the Agro-researcher from the Compound fertilizer NW, expressed his view on the subject thusly: *“cooperation between parties from a same field lacks complementarity.”* While Mr. Xu, PR manager of the Chemical engineer, believed that: *“cooperation in the same field has potential competitive elements, it would not have such problems if it was in different fields.”* Mr. Hao, the POE broker and his market manager Mr. Zhang Feng concluded that: *“companies in the same field (bio-fertilizer business) have no possibilities to cooperate...”* and Mr. Wu, the distributor in the same NW said: *“[when working] within a same field, we can benefit from balancing prices, but it is not easy to handle a competitive relationship.”*

The informants from the two DNWs were generally less enthusiastic about the combination of similar activities. As Mr. Xiang, director of the Seeds reproducer in the Hybrid seeds NW, said: *“... in the same business field, complementary technical resources help to achieve a bigger leverage. However, potential competition and conflict of interest exist. When working in different fields there is no such problem.”*

Mr. Jiao, the Seeds distributor business manager, introduced his experience from the seeds business point of view: *“...we have some specific cooperative activities such as the mutual lending of stocks etc. with firms from the same field - however, not at strategic level. We are definitely against each other strategically because we are competitors.”* Professor Zhao, head of the Seeds broker, expressed his view about combination of similar activities in relation to their concern of cooperating with another seeds research institute: *“...cooperation in the same field brings only identical strengths and has competitive potentiality. In regards to the present situation of intellectual property protection, we prefer to be cautious”* (in cooperating with partners with same activity). In the Honeybee NW, Mr. Sun, the Vegetable researcher worried about that: *“...Cooperation between parties from a same field may cause technology to leak.”*

Having presented the views and experiences of the NW participants in relation to the advantages and disadvantages of the similarity NW, the following section presents the findings with respect to the complementary NWs.

4.6.2.2 Complementary NWs – Advantages and Disadvantages

Data collected from questions 10,11 and 12 (member) and 11,12 and 13 (broker) of the interview guide showed that all of the 18 informants interviewed from the DNWs and the SNWs expressed preferences towards the combination of complementary activities. As Professor Zhao, the Seeds broker, said: *“...cooperation between different fields have advantages of complementary resources and strength. In our case, the Seeds broker is responsible for technology, while the local partners manage farmers, and the seeds companies do the distribution. We need more complementary partners with large industrial and financial resources.”* Mr. Liang, the Parent seeds producer explained *“...I believe the cooperation between the parties from different fields is better than cooperation from a same field, because of the complementary*

resources and strength of the partners. We have many conflicts of interests with other similar organizations engaged in the same kind of activities as ours in neighborhood areas (pricing of agribusiness products, statistic reporting etc). With the Seeds broker we do not have such problem." Mr. Xu Changmao manager of the Township administrator in the Honeybee NW shares the opinion: *"cooperation between the partners from different fields has the advantage of adding complementary strength to each other and has less competing elements. I choose to cooperate with partners from different fields."* Similar views were heard from the two SNWs such as Mr. Hao the POE broker: *"...in complementary cooperation in different fields, as in our case, the producer supplies the product and provides after sales service, farmers listen to the Science bureau (government influence) while the Biofertilizer distributor has a good reputation, local retail outlets, and financial capabilities."*

Data collected from the Ammonia NW showed that the majority of informants operating with similar activity combinations also expressed preference towards complementarity of combined activities. Mr. Zhou, the SOIE broker, talked about many good aspects of the similarity of combined activities as presented in the preceding section, and but also remarked that: *"for the strategic formation, mutual complementariness is important in a value chain."* Not only did he agree with other informants about the advantages of complementary resources and strength between partners, but also added: *"...complementary cooperation tends to be more long-term oriented because there are no conflicts of interest or competitive elements between the partners."*

Mr. Liu, GM, of the Market Center, based on his experience from the Ammonia NW, concluded: *"I think cooperative partners with complementary resources and strength are better (than the cooperative partners with similar resources and strength)."* Similarly, Mr. Zhu, an Ammonia NW member and the Qingpu plant manager, said: *"I prefer cooperation between partners from different fields, because of their complementary resources. Innovation (referring innovation in organizational form) is beneficial to the development of enterprises."* Mr. Guo, the Pesticide researcher and former deputy director responsible for technology of the Agrochemicals NW, said: *"I think the best is [arrangement is] complementary cooperation between partners who are in the same industry, but with different professions."* According to Mr. Gao, former deputy director of the Agrochemicals NW: *"...if I could choose, I would choose market based cooperation (versus administratively arranged relationships) with privately owned partners having complementary resources."* A further statement made by Mr. Lu, former deputy director responsible for marketing in the Agrochemicals NW: *"It is not important whether cooperative partners were from similar fields or not, the key thing is the complementary factor."*

Questions 45 (member) and 47 (broker) asked informants *"what type of organizational form and cooperative arrangements are more suitable for the agribusiness sector at present in China's economic development stage and why?"* The informants' responses to this question, especially those from the SNWs and INWs, emphasized the complementary cooperative relationship between the partners as the most suitable forms of cooperation for the agribusiness sector.

However, different views were heard as well. Few informants raised their individual viewpoints of the disadvantage aspects of such activity combination. Mr. Chen, the Fertilizer producer and GM in the Compound fertilizer NW, expressed the following from his operational point of view: *"...the disadvantages were that all partners might be less familiar with the product compared, to the same field partners or the partners who are doing the same activity."* This view was further extended by the Fengxian

fertilizer plant manager Mr. Tian in the Ammonia NW to a direction of potential impact on the partner's relations: *"for example, with the distribution of benefits, for a similar operation, partners understand comparative elements such as cost structure and pricing etc. Partners from a different fields might have different views, and, therefore, more chances for conflict."* Similar worries came from Mr. Gao, former deputy director of the Agrochemicals NW: *"...different field partners can be complementary to each other, but the communications may not be easy."*

Regarding communication between partners who are unfamiliar with each other's activities Mr. Tian, the Agro-tech center in the Compound fertilizer, NW has the view that: *"It might be less easy to communicate over too-technical matters for the partners from different fields, but one is specialized in his own field and other partners should be trusted for the rest. I think cooperation between the different fields is better because of the mutual complementarities."*

Data collected from questions 10,11 and 12 (member) and 11,12 and 13 (broker) of the interview guide showed the different views and preferences of the NW participants toward the two forms of activity combinations. The overwhelming majority of the informants interviewed were in favor of **complementarity of combined activities**. The actors' preference towards combining activities with partners who have complementary resources and competence is in line with the findings in section 4.5 - wherein the survey results showed that complementary resources were very important factors for cooperation – as was viewed by most of the actors in the NW groups. The findings of this section and related sections implicate that the complementary NWs, as preferred by the participants, would require brokers to be particularly capable of managing the complex relationships between several cross-functional actors. Especially brokers should pay attention to those factors which could potentially affect the effectiveness of the complementary NWs as some critics raised by the NW participants at the end of this section.

4.6.2.3 Risks of Losing Knowledge in Combination of Activities

Many literatures suggest that one of the important risks of alliance is loss of knowledge. Regarding this particular issue, question 31 (member) 33 (broker) of the interview guide asked informants *"are you afraid of losing your know-how or commercial secrets in this cooperation? What measures did you seek to protect your know-how?"*

Data collected through question 31 and 33 showed that risk of loss of knowledge was found to be, indeed, a major concern by the actors in both complementarity and similarity NWs. As Mr. Sun, the Vegetable researcher in the Honeybee NW, said in the preceding section: *"...cooperation between parties from a same field may cause technology to leak."* In the Ammonia NW where similar activities were combined, Mr. Tian, the Fengxian fertilizer plant manager said: *"disclosure of commercial secrets may be the disadvantage of similarity cooperation."* He further described that in the Ammonia NW, although less worried about their outdated production technology, the partners were on their guard all of the time, fearing disclosure of their commercial secrets to other NW members - such as arrangements with particular customer networks. Consequently, the exchange of information among the partners within the Ammonia NW was often conducted in ambiguous ways.

Similar situations were found in the Agrochemicals NW, according to Mr. Guo, head of the Pesticide researcher: *"...we were worried about this point, we insisted signing a*

confidentiality agreement with the partners in the Agrochemicals NW...” Knowledge loss risks in the alliances with similarity of combined activities can be explained by the fact that even in the most basic similar activity there can be different quality standards achieved by different operators using similar production process or facilities.

In the Hybrid seeds NW, according to Professor Zhao’s explanation, prior to the stage of commercializing their research result, the Seeds broker did consider the possible options - such as having licensing or royalty arrangements with a commercial firm in the seeds field. However, he concluded to do it all on his own. This decision was made largely due to the concern for loss of knowledge. To prevent their technology from possible imitation by partners, precautionary measures were taken, as Professor Zhao explained: *“we mainly used technical protection measures, such as producing ‘one time use’ seeds, geographically separating the production and application sites, publishing less information, controlling brain drain, and speeding up development process.”*

Similarly, in the Honeybee NW, Mr. Wang, also admitted: *“...we afraid of possible leaking of the key technology and therefore used a technical control mechanism for example, ‘one time use bee colonies’.”* Further, when Mr. Sun the Vegetable researcher was asked if he was worried about potential issue, he replied: *“Yes, we did worry about this (technology leaking) so we used a special code system and locked up the operational sites.”* In the Compound fertilizer NW case, Mr. Xu, the Chemical engineer said: *“...we have some worries on this particular aspect, we used an agreement for our protection.”*

According to data collected in relation to the issue of knowledge protection, most of the informants who have expressed concerns on the loss of knowledge were the SORI actors. For the actors belonging to this group, **“technology”** is the major resource they possess and most of them are in the DNWs and SNWs.

For government actors and actors who were operating in the more traditional industrial sector and with relatively less advanced technology (as did the SOIE actors in the Agrochemicals and Ammonia NWs, the SODE broker, the Fertilizer producer and the Agro-tech center in the Compound fertilizer NW and all partners in the Biofertilizer NW) expressed little concern about the risks of knowledge loss. In this case, however, concern for knowledge loss may be associated with disclosure of commercial secrets, as Mr. Tian, from the Ammonia NW explained earlier. The protection methods used by the actors who were afraid of losing knowledge were mainly through means of technical control and legal agreements.

Another dimension of the issue, according to the informants interviewed, is that loss of knowledge happens more in the cooperative arrangement between the partners who have similar or close expertise in similar professional fields or activities than between partners who have different professional disciplines. The latter were evidenced by their responses to questions 31 and 33. The Parent seeds producer, the Seeds reproducer and the Seeds distributor in the Hybrid seeds NW and the Science administrator, and the Township administrator in the Honeybee NW, and nearly all of the actors in the Compound fertilizer and the Biofertilizer SNWs have all simply expressed that they were not concerned about the issue (loss of knowledge). Table 44 summarizes the advantages and disadvantages of the two forms of combination of activities evaluated by the informants based on their experiences in the NW groups.

Table 44: Informant's Evaluation of the Two Forms of Combination of Activities

Preferences of form of activity combination (n=18)		ADVANTAGES	DISADVANTAGES
3	SIMILARITY of combined activities	- Costs reduction - Concentrated resources - Economies of scale - Supply/purchasing power for a particular product or service - Market share position (for a single product) - Partner communication	- Conflicts of interests/ potential competition - Lack of complementary resources - Risk of knowledge loss - Narrow knowledge scope - Lack of innovation
* 18	COMPLEMENTARITY of combined activities	- Complementary resources and competences between partners - Costs reduction - Innovation - Flexible relationships between partners	- Risk of knowledge loss - Communication barrier between partners of different activities

*Some informants expressed their preferences on both forms of combination of activities with different emphasis.

4.6.3 The Structure of Relations in the NW Groups

This section is aimed at describing and measuring the formal structure of relations in the NW groups by analyzing the following selected variables: the formal and informal cooperative arrangement of the NWs, loose and tight relationship couplings, centrality, and structural hole.

4.6.3.1 The Formal and Informal Cooperative Arrangement of the NWs

According to the literature presented in section 2.3.2.1 formal cooperative arrangements consist of joint ventures, licensing, co-production agreements and management contracts. Industrial NWs are informal cooperative arrangements. The actors in the NW groups of this dissertation are pursuing both formal and informal cooperative strategies. Both formal and informal NWs are found in the data collected. The following sections will describe the findings of these dimensions in the NW groups.

4.6.3.1.1 The Formal Dimension of the NW Cooperation

The formal dimension of the cooperation in the NW groups is found mainly in the Agrochemicals and the Ammonia INWs. The first characteristic of the formal dimensions found in the two INWs, and in the Agrochemicals NW as well, is the high degree of visibility they have during the formation phase as a consequence of strong support provided by the central and provincial industrial administrators. However, from the data collected, the ease of their early formation did not necessarily, in the development stage, translate into successful business operation (refer to section 4.8).

The second characteristics of the formal arrangements are that the formation of the two INWs was initiated by **command** instead of by **market**. The SOIE actors in the two INWs followed directives from their respective superintendents to work together in newly formed set-ups for predetermined objectives. This was seen in section 4.4, “*decisions of the superior /required by the State owners*” were said, by all the SOIE actors, to be the most important factor which decided the formation of the two INWs. Data collected through question 3 of the interview guide explained the ways the NW organizations were initiated (see question 3 of the interview guide). Mr. Zhou, Chairman of the SOIE broker, briefed the initiative process of the Ammonia NW’s formation thusly: “*We first organized plant manager meetings to announce and explain strategic reasoning to them. The managers welcomed the move. The municipal economic commission and planning commission empowered us with responsibility for the restructuring task.*” And Mr. Liu GM of the Ammonia NW added: “*the SOIE broker carried out the restructuring process by organizing administrative conferences and issuing documents to the member plants. The municipal government department supported the operation by subsidizing 1/3 of the electricity costs of the Ammonia NW plants.*” However, from a member point of view, Mr. Zhu, manager of Qingpu fertilizer plant had a different response to the same question: “*...the SOIE broker activated the process by sending documents and organizing meetings at the plants. Some of the members just obeyed orders, while other plans who were pressured wished to profit from the changes. There were no market-based evaluationson other alternatives, such as conducting a feasibility study ...*” another informant Mr. Tian, the Fengxian fertilizer plant, explained that: “*...a project team from the SOIE broker implemented the process, formed a BOD and appointed a GM and deputy GMs...*” The five informants interviewed from the Agrochemicals NW unanimously responded to the question: “*the new group was initiated by MCI’s strategic decision to establish the South Synthesis Center.*” Consequently, under the top down integration process, the relationship pattern between the partners was an arranged relationship instead of a chosen one.

4.6.3.1.2 The Informal Dimension of the NW Cooperation

The informal dimension of the cooperation in the NWs group of this study was examined in the Hybrid seeds, Honeybee and Biofertilizer NWs. Contrasting to the characteristics of the two formal INWs presented in section 4.6.3.1.1, the visibilities of the NWs’ formation were low, but the cooperation between the actors in the informal NWs were successful (refer to section 4.8).

As analyzed in the previous section, 4.4, the actors of this group of NWs formed cooperative arrangements out of their own motives of “**responding to a growth opportunity.**” This has characterized the formation of the Hybrid seeds, Honeybee, and the Biofertilizer NWs as being driven by market decisions, rather than by command driven decisions as was found with the INWs. Furthermore, this market driven initiative is manifest by the fact that the three brokers in each NW, initiated the respective cooperative arrangements with other actors who had complementary (as opposed to similar) resources and competences. Professor Zhao, the Seeds broker, responded to question 3 of the interview guide, this way: “*...We initiated the cooperation. The hybrid breeding process technically requires some natural environmental conditions. We tried to do the fieldwork on our own for about four years, but it was inefficient, risky and the result was poor. We realized the need and advantages of cooperating and sharing risk with partners with government*

background at local sites, and all the parties were interested.” In the Biofertilizer NW, Mr. Hao, the POE broker, explained his initiative of the Biofertilizer NW cooperation thusly: *“We wanted to introduce our product to Yichuan county... as a model of cooperation between a local government department which is trusted by farmers. A technical professional, the POE broker, and a local distributor came into my mind as possible allies.”* In the Honeybee NW case, Mr. Wang was the initiator of the cooperative arrangement in pollination service: *“We initiated the project and approved by BAAFS management for establishing the Honeybee NW.”*

The informal dimension was also characterized by the formation process of the NW alliances between the actors that evolved over a period of time as a consequence awareness of mutual interests grew. Data demonstrating this third characteristic include: the seeds field trial activities between the partners in the Hybrid seeds NW; the “Wall bee” field research cooperation between the Bee broker and his partners; the exhibition-organizing activities between the POE broker and the Science bureau; and the professional exchanging activities between the actors in the Compound fertilizer NW. As Mr. Jiao, the Seeds distributor, said: *“we had known the Seeds broker since 1988 and had always been looking for new products with mid-to-long term prospects. The hybrid wheat seeds have a great market potential. We wish to have a special relationship with the Seeds broker to get more supply of the seeds,”* and Mr. Liang, deputy director of the Parent seeds producer explained *“... Professor Zhao was the initiator of the cooperation. We had collaborative activities with the Seeds broker in the past and it was a pleasant experience ... We believed that this project has a great potential and we have a long-term strategic view on this cooperation and how it can affect the development of the North China wheat market.”* Similar explanations came from Mr. Xiang, director of the Seeds reproducer *“We were introduced to the Seeds broker in 1995, and we offered our site as its field experimental base. ... The trial result was good, and we had high interest in the cooperation.”* Similar relationship evolution was found in the Honeybee and Biofertilizer NWs (see question 3 of the interview guide). In the Compound fertilizer NW, the SODE broker, Mr. Chen, introduced the evolutionary characteristics of his NW: *“we knew each other and had cooperated before. Due to our complementary strengths, we have arrived at today’s cooperation.”* Mr. Zhou, the Agro-researcher also stated: *“we had previous cooperation experience with the SODE broker.”* Mr. Xu, the Chemical engineer: *“we had previous cooperation experience with the SODE broker, and the leading members of our two organizations have good relationship with him as well,”* and Mr. Tian, the Agro-tech center added to this: *“we knew most of the partners from many joint activities.”*

The informal dimension of the NW groups in this study show that, during the process of their social and business exchanges, the actors had invested in the relationship with each other and, consequently, **developed trust at both organizational and personal levels.**

Data collected during the interviews have confirmed that personal relationships and trust were the foundation of cooperation in the informal NWs - especially the DNWs and SNWs where the actors emphasized more on relationship and trust development between partners. However in the two INWs, the Agrochemicals NW in particular, less emphasis was put on this aspect. In the Ammonia NW the general manager exerted considerable efforts to developing sound personal relationship with the NW members. Since the NW was arranged by the SOIE broker, instead of the partners’

own will, the formation of the Ammonia NW was not based on trust, as was in the informal NWs. The internal instability characterized by the partners' uncooperative attitude, competitive behavior, plus the increasingly tough external market conditions caused by fertilizer oversupply, along with competition from new technology and products made the road of the Ammonia NW even bumpier.

The importance of personal relationships and trust between partners were further illustrated by data collected from questions 32/33 (for members) 34 (broker) and 35 (stakeholder) of the interview guide. An in-depth treatment of the variable of personal relationships and trust made in section 4.7.2.2 - which is dedicated to the subjects of cultural development, personal relationship, and trust.

4.6.3.1.3 The Formal and Informal Dimensions of the NW Cooperation

Unlike all of the other NWs presented in the preceding section, the Compound fertilizer NW's structure combined both formal and informal dimensions. The SODE broker had a formal equity share JV partnership with the Fertilizer producer while also having loosely coupled relationships with the two SORI actors and the agrotechnical administrator. This combined relationship pattern, as a consequence of its formation, has two characteristics in relation to the actors' relationships in this NW. First, due to the influence of his SOE background, the SODE broker habitually preferred formally integrated cooperative arrangements between the partners. And second, the evolutionary characteristic of the informal cooperative arrangement between the partners allowed formation of the Compound fertilizer NW become a reality. Table 45 presents an overview of the formal and informal aspects of the NW groups.

Table 45: The Formal and Informal Aspects of Cooperation in the NW groups

NW Cooperation	Characteristics	NWs
Formal dimension	- Prescribed NWs, Government initiated formation - High visibility - Integration - Legal arrangements	The Agrochemicals NW
		The Ammonia fertilizer NW
Informal dimension	- Emergent NWs, Market initiated formation - Cooperation based on personal trust developed through social/business exchange and evolves as consequences of growing awareness of mutual interests - The parties invest in the relationship with each other - Visibility comes first and business later	The Hybrid Seeds NW
		The Honeybee NW
		The Biofertilizer NW
Formal & informal dimensions	- Legal arrangements /integration	The Compound fertilizer NW

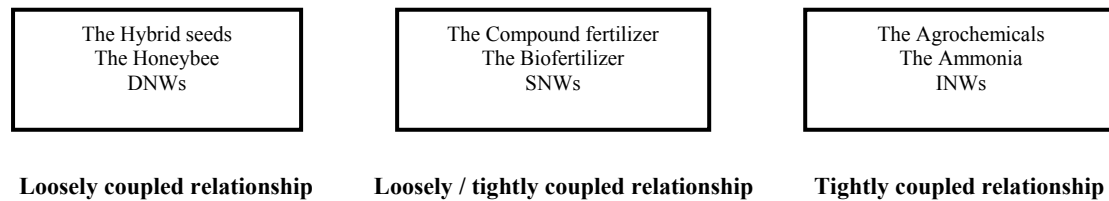
The previous section has presented and analyzed the formal and informal dimensions in the NW groups. Data analysis shows that, the command prescriptions characterize the formal NWs, as opposed to the informal NWs (which are characterized by market driven decisions made by the NW participants themselves and evolutionary development relationships and cooperation). Conclusively, the informants interviewed expressed their preference more towards informal NW cooperative arrangement to formal ones.

Having analyzed the formal and informal dimensions of the NW groups, the coming section presents the different coupling systems and their impacts in the NW groups.

4.6.3.2 Differently Coupled Relationships between NW Participants

According to literature presented in 2.3.2.1, NWs are ‘loosely coupled systems’ when compared to hierarchical organizations - and are relatively ‘tightly coupled systems’ when compared to purely market-style relations. The six NWs investigated in this study all had different kinds of coupling systems. The DNWs were loosely coupled cooperative systems, the INWs are tightly coupled cooperative systems, and finally, the two SNWs flowed between loosely and tightly coupled systems. Figure 35 illustrates the different degree of couplings in the different NWs.

Figure 35: The Loose and Tight Coupling Systems in the Different NWs



The current section focuses on identifying and analyzing the elements that are coupled with different degree by the actors, and in particular the brokers, in the NWs investigated; as well as the impact of these differently coupled relations and systems on the NW performance. Data collected from questions 19 (member) and 20 (broker) of the interview guide reflect the views of the NW actors in relation to the coupling systems in their respective NWs.

4.6.3.2.1 The Loose Coupling Systems in the NW Groups

In the Hybrid seeds and Honeybee DNWs, the Seeds, and the Bee brokers have arranged cooperative structures with their primary contacts interacting to accomplish highly differentiated tasks, while each actor simultaneously maintains his independent legal entity and autonomous status. The relations between these partners are coupled in the domains of partial hybrid seeds operation production and honeybee pollination processes. Professor Zhao explained his view regarding the loose coupling system in the Hybrid seeds NW in the following extract: “...the loosely linked relationship provided each party a freedom of choice and independence I think it is the best model. Based on the experience of our cooperation, it is unnecessary to put tight controls in many areas. As long as the target could be hit any means could be used. For example, on the field level, the local authorities could apply both market and administrative means; we do not integrate everything into our place...” Other actors in the Hybrid seeds NW also expressed their opinions about the loosely coupled system. As Mr. Xiang, the Seeds reproducer explained: “...the loosely linked relationship is good; because it avoids those who are eating from the ‘Big-Messy-Rice Pot’ (a Chinese term for public-funds abuse) and brings the initiatives of all parties involved in the cooperation into full play.” Mr. Jiao, the Seeds distributor also said “I think the present loosely linked relationship is good. We do not want to integrate into one company because our scope of business covers more than the seeds business. However, at the same time when each partner retains their independent status, a tightly linked contractual relationship is necessary to help regulate both parties.”

In the Honeybee NW, Mr. Wang responded to question 20 of the interview with: “a loosely coupled relationship is determined by the market elements and offers

flexibility. According to the experience we have with our partners, a loosely linked relationship is good." Mr. Liu the Chairman of the Beekeepers association: *"a loosely linked relationship is good because each partner has its strengths. A tightly linked relationship restricts players in each of their own fields. Therefore, it is not good for development."* Another SORI actor in the Honeybee NW, the Vegetable researcher Mr. Sun, also favored the loose coupling relationship saying: *"a loosely coupled relationship is better to both parties because of the freedom and flexibility."*

The characteristics of the loosely coupled cooperative systems in the DNWs are that partners use a yearly based renewable agreement, and the relations are coupled in the domains of non-essential technological areas where the actors have fewer available resources to accomplish the tasks by themselves, therefore they have to rely on one another's strength. Tightly coupled elements in cooperative arrangements are mostly found in the operational process when sensitive technology is involved - as explained by Professor Zhao: *"...we only use a tightly linked relationship in the Shunyi base because of the sensitive nature of key technology..."*

As indicated by the informant's responses to question 20 of the interview guide, the brokers and most of the NW members considered loosely coupled relationships as important to the successful cooperation of their NW. Some NW participants even believed that a loosely coupled system was better-suited NW operation during the initial stage as well. With further business development the systems would eventually have to be changed into a mode of tighter coupling relationships. As Mr. Xu, the Township administrator said: *"for the time being, a loosely linked relationship is better. As for the future, when the business grows bigger and has more complexity, a tighter relationship may be better to enforce partners' performing their own duties."* Mr. Liang from the Parent seeds producer expressed the same view: *"for the present time, a loosely linked relationship is good, as each party has its own needs. However, for the future, we are thinking of forming a partnership company engaging in larger scale business operation (the North China Strategy)[and will, therefore have] to centralize the resources."*

To determine the NW actors' preference on the forms of cooperative arrangement in the agribusiness sector, questions 45 (member) and 47 (broker) asked informants *"what type of organization form/cooperative arrangements are more suitable for the agribusiness sector at China's present economic development stage/ and why?"* The responses from the informants, especially from the two DNWs emphasized, that the loosely coupled cooperative relationship between the partners are the most suitable forms of cooperation for the agribusiness sector.

Finally, in response to question 7 of the interview guide – which asked informants whether the different ownership of various actors was an issue to the cooperation, Professor Zhao confirmed that: *"it is precisely because of the loosely coupled system that the partners cooperating with different ownership systems did not have any problems."* Mr. Wang, the broker of the Honeybee NW, echoed this in this statement: *"since the relationship between the partners of the present cooperation is loosely coupled, no problems associated with the different ownership systems have emerged so far."* Both SORI brokers believed that loosely coupled relationships between the NW participants have created space to accommodate the differences of each of the NW partners and, thus, enabled them to concentrate more on the productive cooperative operations.

4.6.3.2.2 The Tight Coupling Systems in the NW Groups

In the Agrochemicals and Ammonia INWs, the two State industrial administrative brokers, have arranged rather vertically integrated structures for their two organizations. Although the actors within the structure kept their independent legal entity status, they were still tightly coupled in their use of the common corporate systems that integrated all administrative and operational elements of each unit within the system - especially in the Agrochemicals NW. In the Ammonia NW, although the domains of coupling are only on the marketing operation, since all NW members are operational units under a same corporate umbrella, and all engaged in a complete same activity dealing with a same product line, Consequently, their overall relationships were tightly coupled.

Different opinions toward the coupling systems in the two hierarchical systems were seen from the responses of the participants to questions 19 (member) and 20 (broker). Mr. Lang, the former president explained his personal view regarding the tight coupling system in the Agrochemicals NW: “... *a loosely linked relationship is easy to coordinate and reach agreement. A tightly linked relationship has the problem of dealing with the vertical type of relationship...*” his feeling specifically referred to the experience of non-cooperative behavior among the NW partners. Mr. Guo, the Pesticide researcher and former deputy director of the Agrochemicals NW, also expressed his view on the subject: “...*a loosely linked relationship has a temporary nature, existing only if there is a benefit - otherwise it could not develop; it is normally used for temporary projects (e.g. a field trial). We preferred to choose between the two, having an operationally tight and legally loose linking relationship.*” In the Ammonia NW, Mr. Liu, GM of the Marketing center believed: “...*a tightly linked relationship makes partners treat their responsibility and duty seriously because of the clear consequences.*” Mr. Tian of the Fengxian fertilizer plant supported tight coupling as well: “*a tightly linked relationship is better, because there are often too many uncertainties...*” However, Mr. Zhu from the Qingpu fertilizer plant saw the matter differently, he argued: “*the loosely linked relationship allowed more freedom and dynamism.*”

The views of NW actors of the Agrochemicals and Ammonia NWs toward the relationship coupling were rather mixed. No particular evidences were linked to the failure of the Agrochemicals NW and the unsatisfactory result of the Ammonia NW in relationship to the coupling systems they applied. The key managers of the Agrochemicals NW strongly voiced that enforcing a tightly coupled relationship among the partners, as characterized by typical SOE styles, did not help the group to achieve congruent management actions and performance expectations; especially at the time of China's overall economic transitional stage, new ways of relationships were pursued by many enterprises. In the Ammonia NW's case, the GM thought differently from the members. The GM favored a tighter relationship to strengthen the vertical authority in the NW, while most of the NW members themselves preferred to have a flexible and loosely coupled relationship with the corporate organization and believed that the individual fertilizer plants could perform better with less SOE system control and more autonomy.

4.6.3.2.3 The Loose and Tight Coupling Systems in the NW Groups

Compared to the DNWs and INWs, the SODE broker of the Compound fertilizer NW used a mixed coupling system in his NW. While the SODE broker along with the

Fertilizer producer, used a tightly coupled system which integrated the key production technology, management expertise, capital investment and a special status which enabled the venture benefiting from the governmental policy - the same SODE broker, managed a relatively loosely coupled cooperative agreement with the other partners that enabled the establishment of the venture and retained valuable roles of the two SORI actors and one administrative partner to the NW. When the NW entered into the development phase, for the SODE broker, a loosely coupled relationship structure showed more advantages over a tightly coupled one with the SORI - since the research and administrative partners had less industrial and business experience therefore, have less frequent operational involvement in the day to day management during the NW development process.

The perceptions toward this relational arrangement from the three loosely coupled partners are reflected in their responses to the question 20 of the interview guide. As the Agro-researcher said: *"... loosely linked relationships allow more freedom and dynamism. However, it could also lead to less responsible relationship."* The Chemical engineer believed that: *"A tightly linked relationship is better, because a contract relationship offers minimum protection and there is an arbitration available in case of disputes."* Finally, the Agro-tech center spoke from the point of view of the State agrotechnical administrator: *"a loosely linked relationship is good, because we have so many tasks; promoting fertilizer is only a small part of our operation. We prefer to leave space free for others."* The key merit of a combination of loose and tight coupling systems, on the elements of cooperative relationship between the five partners, is the successful establishment of the strategic position - as determined by the SODE broker. Additionally, these arrangements, to a certain extent, have paved a way for the future so that each partner can focus professionally and proportionally on the tasks relating to the developmental process of the NW operation.

In the Biofertilizer NW, the cooperative relationship between the three actors was initiated and developed based on a verbal understanding. Coupling occurs in the domains of promotion and distribution of the biofertilizer product. The cooperative relationship was rather loosely coupled in terms of each partner's independent, legal entity and autonomous status. Nevertheless, with the achievement of initial successful results of the NW cooperation, the actors' attitude towards the relational coupling began to vary - as is reflected in their responses to question 20 of the interview guide. Mr. Hao, the POE broker explained his view on the matter: *"a loosely coupled relationship is better than a tight one in situations where each party has its own interest and parties, and once joined, then have a common interest - this is because each party will try his efforts for the common interests and will take care of their own concerns separately."* Contrary to this statement, Mr. Wu - the other POE actor/ Biofertilizer distributor, strongly expressed his concern about the absence of a tightly structured contract regulating the relationship between the partners. He feared that at some point, some individuals from the Science bureau would try to endanger his business by taking over the role of distribution in Yichuan County. Therefore, he clearly expressed his preference of a tight coupling partner relationship when he responded to question 20: *"a tightly linked relationship is better because the closeness can bind both parties - and this is to the benefit for the development of the business."* He increasingly pushed for a contract with the broker firm, who later agreed with the request. Mr. Liu, director of the Science bureau, supported this move: *"a tight relationship emphasizes responsibilities; a loosely coupled relationship emphasizes fewer responsibilities in this respect."* Because of its Governmental status and its lack of experience in handling business operations (as described in the case

descriptions) (see Appendix I, 4-6), the Science bureau was happy to keep a loosely coupled cooperative relationship with the two POE actors. At present, the broker of the Biofertilizer NW operates successfully with a combined loose and tight coupling system with the two NW partners.

In the DNWs, the brokers **loosely coupled** their relationship with the other NW members, which enabled different types of actors to work together toward common NW interests while maintaining their independent status and commitment to their other obligations outside the NWs. The loose coupling system of relationship creates room for actors using their specific approach in solving certain problems - such as using administrative means to handle the field operation by the government actors. The brokers of the two SNWs used both **loosely and tightly coupled** systems with the different types of NW partners for the sake of accommodating their different partners' needs. In the INWs, largely due to the transitional nature from the traditional hierarchical SOE structure to a market oriented organizational structure (and to a certain extent because of the characteristics of this type of INW) the brokers used a **relative tightly coupled** system which emphasized control of the NW members' activities.

General observations from interviewing the informants shows that brokers in the DNWs and SNWs (namely the market initiated NWs) have tendencies to put their preferences on a loosely coupled instead of tightly coupled cooperative relationship with their respective NW members. This phenomenon may be explained by reviewing the characteristics of the type of NWs discussed previously by Miles and Snow (1992). The two DNWs emerged in settings where new, and high market potential required managerial capability for large-scale field operation, and where investments in costly special-purpose assets were risky. The DNW models enabled the two brokers to hold technology assets, which they could employ fully and flexibly, while focusing on their portion of the value chain and forge relationships with other specialist partners to offer the final product and service. Besides, the broker's central position (degree centrality of power, alternatives, possession of key resources) also favors the broker's persistence of maintaining such flexible organization forms. In the SNWs, the SODE broker and the POE broker were in a mature industry with relatively predictable market cycles and demands. SNWs formed around the SODE broker and the POE broker for which NW partners contributed both upstream and downstream services (technical support, production and promotion in the Compound fertilizer NW case; promotion and distribution in the POE broker case). Relational arrangements combining both loose and tight coupling dimensions with different NW partners may better suit the SNW environment. In the two INWs case, the State broker and the SOIE broker used tightly coupled relationships to gain competitive advantages through shared utilization of internally owned assets as well as continuing development and exchange of managerial and technical know-how.

Observations from the informants also show the different attitudes the NW members had toward the degree of relationship coupling in the DNWs and SNWs. On one hand, the small POE actors and the SORI actors preferred to have a relatively tight coupling relationship with the lead firms - indicating, to a certain extent, their dependencies on the brokers in reducing uncertainties resulting from involvement in unfamiliar activities. On the other hand, government actors had to maintain loose coupling relationship in the NWs because of their special status. Finally, the SOIE members in the two INWs expressed their preferences towards loosely coupled systems - which indicated their desire for more autonomy.

The third aspect of the degree of coupling systems in the NW groups of this research is that **both loose and tight coupling systems are in constant process of change**. The relational elements that are loosely coupled under the present situation may well become tightly coupled under different situation and vice versa.

4.6.3.3 Centrality and Power in the NWs

This section focuses on the relationship between power and centrality of the brokers in relation to the building process of the NW groups. Sections 4.6.3.3.1, 4.6.3.3.2, and 4.6.3.3.3 first present the empirical analysis, then the theoretical measurement, by applying the three related measures of centrality - **degree, closeness, and betweenness** as summarized by Freeman (1979). Finally, as a comparison to the results of the empirical and theoretical analysis, section 4.6.3.3.4 presents the direct views and experience from the informants interviewed in areas concerning the central relations in each NW. For this purpose, question 15 asked informants: *“who do you think is in a best position to coordinate various relationships in this type of cooperative arrangement?”* Questions 34 (member) 36 (broker) asked informants during the NW development phase, *“which are the firms/individuals that maintain the most important relations in the cooperative arrangement during the operational process?”* (See questions 15 (member) and 16 (broker) and 34 (member) 36 (member) of the interview guide).

4.6.3.3.1 The Hybrid Seeds and Honeybee DNWs

Data in the case descriptions showed (see Appendix I, 1-6 and 2-6) that both the Seeds broker and the Bee broker had the most critical positions in the structures of the two DNWs. First of all, the two brokers were in possession of the most important resources - the technologies for the hybrid seeds production and the honeybee pollination business. Furthermore, both brokers' influential status through scientific and research institutions were respected in the fields.

In addition to key resource aspects, the two brokers initiated the NWs consisting of the partners playing different roles in the NW's activity chain. Among the relationships in the Hybrid seeds NW, the Parent seeds producer, the Seeds reproducer and the Seeds distributor had no ties to each other, therefore, the Seeds broker was the only actor who had trustful relationships separately with all the other participants as result of previous cooperation. Operationally (compared to the roles of each NW participant), by handling the core activities, the Seeds broker, had an irreplaceable position in the NW. As for the other participants, each played important roles in the NW operation. And even if participants did not 'corner the market' – in terms of their services provided – their replacement could still be found in the regions although with additional efforts and costs.

The high centrality of the Seeds broker in the Hybrid seeds NW was based on his control on the direct relations to the other three participants. However, each of the three non-broker partners was still responsible for specific domains of activity in the process of seeds production, and, accordingly, controlled key relevant resources and relations in their respective local communities. As presented in section 4.6.1.1, the Seeds broker experienced unsatisfactory results undertaking his own endeavors without the cooperation of the Parent seeds producer in the Shunyi county and the Seeds reproducer in the Funan region.

The relationships in the Honeybee NW were a bit different from those of the Hybrid seeds NW. The Science administrator, who was in direct contact with the agricultural communities in the local area, introduced the Beekeeper's association to the Bee broker. During the interview Mr. Chen, the Science administrator, believed that in the Pinggu County or at the field level, the Science administrator played a central facilitating role to the pollination operation, this being because of his direct contacts and official influence to both beekeepers and the fruit growers in the area. The Science administrator appreciated the Bee broker as a State research institution whose scientific activities were in line with the function of the Science administrator - in terms of developing rural science and technology. The Beekeepers association appreciated the cooperation with the Bee broker because of the strong business synergy of between not only worked for them in the limited local area, but also (and more importantly) in the other regions where the Bee broker had influence. Data obtained from the interviews showed that the central position of the Bee broker was supported by the Government and POE actors on the basis of their complementary objectives, resources, and combination of activities.

In view of the importance of the NW partners' local strength in the respective NWs, the two brokers spent considerable efforts in developing good relationships with the NW participants. Both NWs demonstrated high degrees of autonomy among each of the NW participants and interdependent relationships between the brokers and the NW participants.

Following the empirical explanations, the theoretical schemes of Freeman (1979), introduced in section 2.4.3.2.2.1, are used to measure the centralities in the two DNWs.

Degree

In the Hybrid seeds NW, the direct links to the actors are calculated by four minus one - giving a degree centrality to the Seeds broker with one indegree and two outdegrees. Each of the remaining actors, the Parent seeds producer, the Seeds reproducer, and the Seeds distributor has a degree centrality of one. The Seeds broker has the highest degree of centrality: three.

Similarly, in the Honeybee NW, the direct links to the actors are calculated by four minus one - giving a degree centrality to the Bee broker with one indegree and two outdegrees. Each of the remaining actors, the Science administrator, the Beekeepers association, and the Township administrator has a degree centrality of one. The Bee broker has the highest degree centrality - three.

The Seeds broker and the Bee broker have the highest degrees of centrality among the actors within the respective reference units. The results of the degree measurements in the two DNWs are shown in Table 46.

Table 46: Degree Centrality in the DNWs

The Hybrid Seeds NW				The Honeybee NW			
The Seeds broker	The Seeds producer	The Seeds reproducer	The Seeds distributor	The Bee broker	The Science administrator	The Township administrator	The Beekeepers association
3	1	1	1	3	1	1	1

Closeness

In surmising the geodesic lengths, from the perspectives of the Seeds broker and the Bee broker to all other actors within the two DNWs, shows that the Seeds broker and

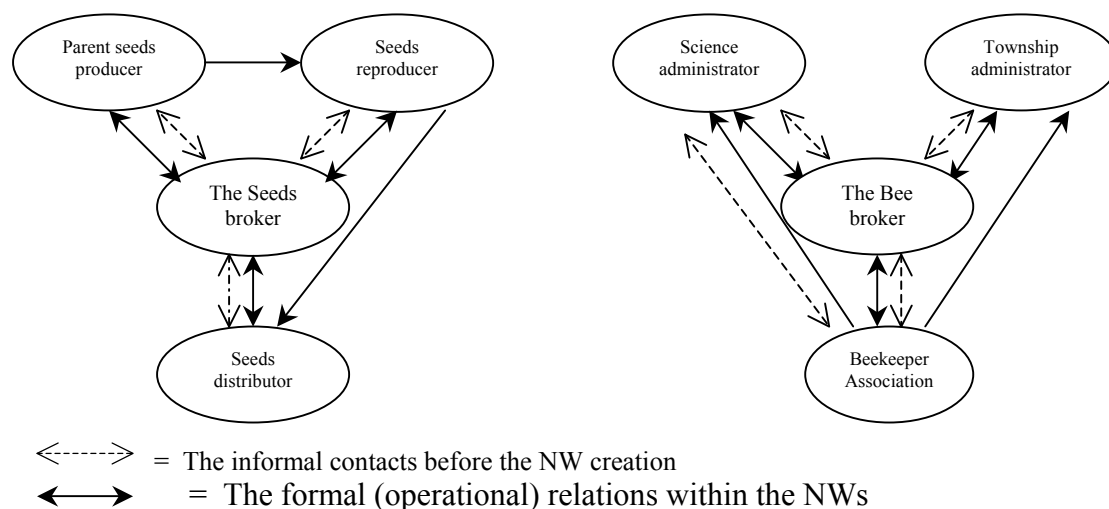
the Bee broker are the most central actors within the NWs. But when using closeness to measure the extended relations of the NWs, the Parent seeds producer, the Seeds reproducer and the Seeds distributor in the Hybrid seeds NW, the Science administrator, the Township administrator, and the Beekeepers association in the Honeybee NW become more central. The above primary contacts to the brokers have shorter paths than the brokers - hence they are more efficient in reaching a greater number of secondary contacts among township, village level administrators, seeds retailers, and hundreds of individual beekeepers.

Betweenness

The centrality measurement within the relations of The Hybrid seeds and Honeybee DNWs indicates that, among the four members in the Hybrid seeds NW, the Seeds broker obtains the highest possible betweenness score - where as the three actors are tied only to the Seeds broker, which is in a star position since it lies on all the geodesics of the NW. Similarly, among the four members in the Honeybee NW, the Bee broker obtains the highest possible betweenness score only where the three actors are tied to the Bee broker's being a star position, which lays on all the geodesics in the NW.

Conversely, when betweenness is used to measure the extended NW relations of the two DNWs, the primary contacts to the brokers - all NW participants (except for the brokers) fall - respectively - between the brokers and a great number of secondary township contacts, village level administrators, seeds retailers and hundreds of other individual beekeepers on the geodesics connecting them. Being the waypoints between the Seeds broker and the Bee broker and the secondary contacts, NW participants (except for the brokers) mediated the flow of resources and communication between the Seeds broker, Bee broker and secondary contacts, further connecting them with a greater number of field operators and users. Thus (when using a betweenness measure) the Parent seeds producer, the Seeds reproducer, the Seeds distributor in the Hybrid seeds NW, and the Science administrator, the Township administrator and the Beekeepers association in the Honeybee NW become more central in their respective NWs. Figure 36 illustrates the centrality relationships in the Hybrid seeds and Honeybee DNWs.

Figure 36: Centrality in the Hybrid seeds and Honeybee DNWs



4.6.3.3.2 The Compound Fertilizer and Biofertilizer SNWs

Data in the case descriptions (see Appendix I, 3-6 and 4-6) showed that the SODE broker and the POE broker in the two SNWs had the most critical positions to the NW's structures - identical to the situations in the DNWs. The SODE broker in the Compound NW obtained his central power, mainly, from three aspects. Firstly, from his resources and core competence aspects - as the SODE broker had rich experience in distributing agricultural means and products, accessing agriculture market channels and customer networks, key raw materials, and State financial funding. This resource and competence strength, as introduced in section 4.2, proved vital to the NW's success - and no other partners in the NW had similar resources. Secondly, from relationship arrangement aspects, the SODE broker formed a relatively formal NW alliance with the Fertilizer producer, the Agro-researcher, the Agro-tech center and the Chemical engineer and this tight coupling system between the partners and shareholding structure gave the SODE broker a majority position in the NW - allowing him to legally control the major decision making processes such as the board of directors. Thirdly, the SODE broker, as a long established distributor of agricultural production means and materials, maintained direct contacts with the other distribution networks in the counties and towns. The current agribusiness market is more in favor of powerful distributors than manufacturers. And finally, the SODE broker developed good relationships with all the partners and in the professional circle, therefore winning high recognition for his position in the agriculture materials business. The building of the central position in the Biofertilizer NW was very different from the Compound fertilizer NW. Unlike the SODE broker, the POE broker used a loosely coupled relationship arrangement between the NW partners. From the resource point of view, the POE broker had technology and facilities for manufacturing biofertilizer but was short of marketing resources to penetrate the targeted market. On the other hand, the Science bureau in the Yichuan County - like the Science administrator in the Honeybee NW - had strong influence and broad contacts in the local area. The director, Mr. Liu, believed that the Science bureau was the center of the operation because all of the major activities were carried out in the local marketplace and beyond - and because it was he who introduced the Biofertilizer distributor to the POE broker in the first place. Nevertheless, the Science bureau also appreciated the POE broker's endeavors to introduce new environmental friendly products to the local fruit growing - and industry that was largely in line with the responsibilities of his bureau. According to data analyzed in section 4.7.2.2.2, all actors in the Biofertilizer NW expressed that their personal relationships played a very important part in the good workings of their cooperation in their NW. In principle, the POE broker gained a central position mainly based on the trust and relationships developed with the other NW partners.

Despite the differences between the two SNWs (in terms of NW structure, coupling systems, cooperative arrangements and operational styles) the two brokers commonly spent efforts emphasizing the development of trust and personal relationships with their NW members. In return, the trust and good relationships in which they invested helped them to gain support from the NW partners in the respective NWs for their central positions. The partners in the Biofertilizer NW had more autonomy than did the partners in the Compound fertilizer NW, and both NWs demonstrated high interdependency relationships between the broker and the NW participants.

The subsequent paragraphs present a theoretical analysis by applying Freeman's measurements of centrality (1979) to the two SNWs.

Degree

In the Compound fertilizer NW, the direct links to the actors are calculated by five minus one, giving a degree centrality to the SODE broker with four outdegrees. Of each of the remaining actors (the Agro-researcher, the Chemical engineer, the Agro-tech center and the Fertilizer producer) all have a degree centrality of one. The SODE broker has the highest degree centrality: four.

In the Biofertilizer NW, the direct links to the actors are calculated by four minus one - giving a degree centrality to the POE broker with three outdegrees, while each of the remaining actors (the Science bureau, the Pomology researcher and the Biofertilizer distributor) have a degree centrality of one. The POE broker has the highest degree centrality: three. Consequently, both brokers have the highest degree centrality among the actors within the respective reference units. Table 47 indicates the degree measurement in the SNWs.

Table 47: Degree Centrality in the SNWs

The Compound fertilizer NW					The Biofertilizer NW			
The SODE broker	The Agro-researcher	The Chemical engineer	The Agro-tech center	The Fertilizer producer	The POE broker	The Science bureau	The Biofertilizer distributor	The Pomology researcher
4	1	1	1	1	3	1	1	1

Closeness

In summing the lengths of the geodesics from the points of the SODE broker and the POE broker to all other actors within the respective two SNWs, it can be seen that the two brokers are the most central actors within the NWs.

In addition to his shortest and most direct links to all the actors within the NW, the broker in the Compound fertilizer NW also had direct links with most of the secondary distributors and retailers at county level agrochemical and fertilizer markets. None of the other actors, such as the Agro-researcher, the Chemical engineer, and the Fertilizer producer, had such commercial links; therefore, the SODE broker maintained a high closeness centrality within the NW and with extended NW relations. In the Biofertilizer NW, when measuring the closeness of the extended relations of the NWs, the two primary contacts (the Science bureau and the Biofertilizer distributor) were more efficient in reaching a greater number of secondary township contacts, village level administrators, and hundreds of individual farmers since their paths were shorter than the POE broker - therefore, they became more central.

Betweenness

Measuring the centrality results within the relations of the Compound fertilizer and the Biofertilizer SNWs indicate that, in the Compound fertilizer NW of five members, the SODE broker obtains the highest possible betweenness score only when the four actors are tied to the broker, who occupies a star position, lying on all the geodesics in the NW. Similarly, In the Biofertilizer NW of four members, the POE broker obtains the highest possible betweenness score only when the three actors are connected to the POE broker in its star position lying on all the geodesics in the NW.

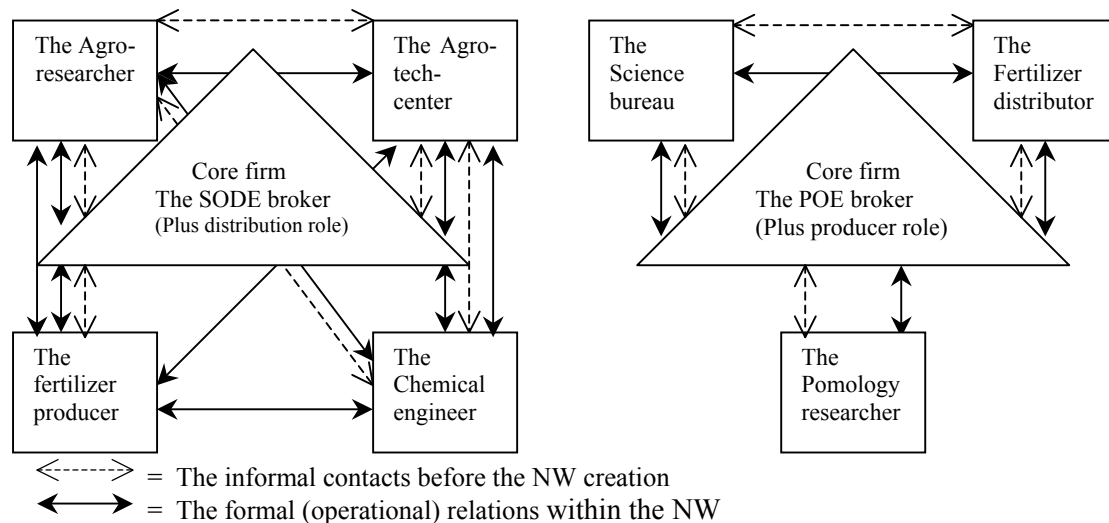
When measuring the extended NW relations of the Compound fertilizer NW, the broker who has direct access to the market maintains a central position because none of the technical partners (except for the Agro-tech center) falls between the broker and fertilizer retailers and major institutional or individual users. The Agro-tech center however (by accessing the secondary contacts of township and village level agrotechnical administrators and major institutional and individual farming groups)

achieves a higher betweenness centrality than the other three partners only positioned next to the SODE broker. After all, though less powerful than the Agro-tech center (in terms of technical influence and organizational capability) the broker also has direct access to the field level operations, giving him a special advantage.

In the Biofertilizer NW, the Science bureau and the Biofertilizer distributor fall - respectively - between the POE broker and many township and village administrators secondary contacts, in addition to the farmers on the geodesics connecting them. By falling between the broker and the secondary contacts, the Science bureau and the Biofertilizer distributor mediated the flow of communication between the POE broker and field operators especially - who were more connected with greater number of institutional and individual farmers in Yichuan County.

The betweenness measures indicate that the SODE broker and the Agro-tech center in the Compound fertilizer NW, and the Science bureau and the Biofertilizer distributor in the Biofertilizer NW had high betweenness centralities. Figure 37 illustrates the centrality in the Compound fertilizer and the Biofertilizer SNWs.

Figure 37: Centrality in the Compound Fertilizer and Biofertilizer SNWs



4.6.3.3.3 The Agrochemicals and Ammonia INWs

Among the NW groups investigated in this research, the two INWs have the characteristic of being command initiated alliance organizations. The central power bases in the two NWs were accordingly determined by this characteristic from the outset of the NWs' formation.

In the Agrochemicals NW, a strong centrality was maintained by the State broker's application of a traditional SOE management system. The three SOIE actors, the Insecticide producer, the Herbicide producer, the Fungicide producer, and one SORI actor, and the Pesticide researcher all followed the decisions made by the State broker under the vertical hierarchical system. According to data collected by questions 32 (members) and 34 (broker), 33 (members) and 35 (broker), under the traditional SOE environment, the State broker emphasized fewer efforts on the development of relationships with the NW participants and more on executive directories and the tasks oriented leadership style, conflict management and impersonal communication with the NW members. This rigid system supported the centrality but it did not, however, help the State broker in achieving any of the expected results during the

development phase. On the contrary, each NW member demonstrated noncompliance to the broker's central authority of and showed uncooperative behaviors between each other by breaking the written rules of the NW. They also ignored various internally coordinated actions. Eventually, these factors caused the failure of the NW.

Due to the same SOE system, the central power in the Ammonia NW also remained strongly with the SOIE broker, as with the situation in the Agrochemicals NW. Under this system, the NW participants had no real commitments to the NW leadership, but instead conducted internal competitive activities among themselves by reducing prices to their own sales channels. However, some differences were found from the behaviors of the brokers in relation to their centrality positions. Unlike the president of the Agrochemicals NW, the General manager of the Marketing center in the Ammonia NW spent considerable efforts developing personal relationships with the NW members and coordinated their activities through value adding ways despite the extremely difficult market environment. His personal oriented behavior to a great extent, creating positive effects in maintaining the centrality of the SOIE broker. Consequently, the organization could continue to work for further improvement.

The common ground of the two State initiated INWs was that both brokers had strong centralities which were internally-determined by the superior organizations under the traditional SOE system. Consequently, all other business relations had no choice but to follow their lead in the central decision making process. However, predetermined centralities have not helped the NWs in achieving their expected objectives, and evoked rather contrary behaviors. On the other hand, different attitudes and ways of handling relationships with the NW members made a difference in the outcomes of performances, as indicated in section 3.3.2.3.3, and the corresponding case descriptions (see Appendix I, 5-6 and 6-6). Having explained the empirical analysis, the theoretical measurements of the centrality in the two INWs are presented in the following paragraphs.

Degree

According to the data presented in the case descriptions (see Appendix I, 5-6), the direct links to the actors in the Agrochemicals NW are calculated by five minus one - giving a degree centrality to the broker with four outdegrees; each of the remaining actors; the Insecticide producer, the Fungicide producer, the Herbicide producer and the Pesticide researcher - have a degree centrality of one. The broker has the highest degree centrality: four.

In the Ammonia NW, the direct links to the actors are calculated by seven minus one - giving a degree centrality to the SOIE broker with three outdegrees and each of the remaining actors CCP, CFP, FCP, NFP, PCP and QCP has a degree centrality of one. The SOIE broker has the highest degree centrality of six.

As a result of degree measurement calculation, both brokers have the highest degree centrality among the actors within the respective reference units. Table 48 illustrates the degree centrality in the Agrochemicals and Ammonia INWs.

Table 48: Degree Centrality in the INWs

The Agrochemicals NW					The Ammonia NW						
The State broker	The Herbicide producer	The Insecticide producer	The Fungicide producer	The Pesticide researcher	The SOIE broker	CCP	CFP	FCP	NFP	PCP	QCP
4	1	1	1	1	6	1	1	1	1	1	1

CCP=Chuansha Chemical plant/ CFP=Chongming Fertilizer Plant/FCP=Fengxian Chemical Plant /NFP=Nanhui Fertilizer Plant/PCP=Pudong Chemical Plant/QCP=the Qingpu chemical plant

Closeness

By summing the lengths of the geodesics from the points of the State broker and the SOIE broker to all other actors within the respective INWs, the two brokers have the most central positions within the NWs. When measuring the extended relations of the NWs, the primary contacts to the brokers - the participants in the two INWs (except for the brokers) - become more central because they have shorter paths than the two brokers and more direct links to a greater number of secondary contacts to agrochemical and fertilizer distributors, as well as retailers and major institutional and individual farming groups.

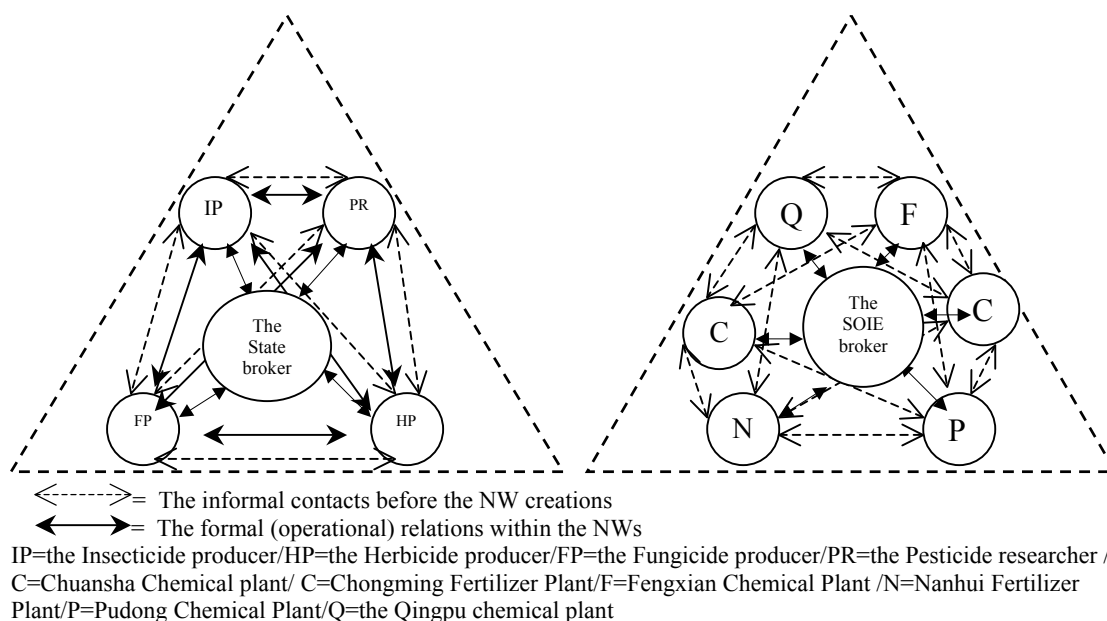
Betweenness

Measuring the centrality within the relations of the two INWs indicates that, in the Agrochemicals NW, the State broker obtains the highest possible betweenness score only when the four actors are tied to the State broker- which is in a star position lying on all the geodesics in the NW. Similarly, in the seven-actor Ammonia NW, the SOIE broker obtains the highest possible betweenness score only when the six actors are tied to the SOIE broker - which is also in a star position lying on all the geodesics in the NW.

When measuring the extended NW relations of the two INWs, all actors (except for the two brokers) fall, respectively, between the State broker and the SOIE broker and the many secondary contacts of agrochemical and fertilizer distributors, retailers and major institutional and individual farming groups on the geodesics connecting them. By falling between the two brokers and secondary contacts, the Insecticide producer, the Herbicide producer, the Fungicide producer, the Pesticide researcher, CCP, CFP, the Fengxian fertilizer plant, NFP, PCP and QCP mediated the flow of resources and communication between the two brokers and secondary contacts.

When measuring the extended NW relations (the primary contacts to the brokers in both INWs), all actors (except for the two brokers) become more central due to their direct contacts to the agrochemical and fertilizer distributors, retailers, and major institutional and individual farming groups. Figure 38 illustrates the centrality in the two INWs.

Figure 38: Centrality in the Agrochemicals and Ammonia INWs



4.6.3.3.4 Centrality Perceived by the NW Participants

Data collected from questions 15, 34, and 36 of the interview guide reflected direct views and experiences from the informants when interviewed about the central relations in the NWs during the different phases of the NW building process. Question 15 asked informants: “*Which (individual or organization) do you think is in the best position to coordinate various relationships in this type of cooperative arrangement?*”? Question 34 (member) and 36 (broker) asked informants, in relationship to the NW development phase, “*which are the firms/individuals that maintain the most important relations in the cooperative arrangement during the operational process?*”

In the Hybrid seeds NW, the responses to questions 15 (member), 16 (broker) and 34 (member), 36 (broker) confirmed the results of the degree measurements; all actors said that the Seeds broker maintained the most important relationship during both formation and development phases. Not surprising, since the broker was in the best position to coordinate various relations because of his control of the key technology and social status.

In the Honeybee NW, the Beekeepers association believed the Bee broker was in the best position for the same reason as in the Hybrid seeds NW. However, the Science administrator and the Township administrator considered *themselves* as the center of relations at the field level because of their positions, controlling information and local influence. In responding to question 34/36, the Bee broker and the two local administrators collectively acknowledged that, “*...the Bee broker and county governments (the Township administrator and the Science administrator) together maintain the most important relations.*” Mr. Chen from the Science administrator emphasized: “*to handle specific operational matters, the key players are the local partners.*” “*Both the Bee broker and the Township administrator were in important position. It won’t work if one is missing,*” concluded Mr. Xu, the Township administrator. This finding conforms to the results of the closeness and betweenness measures - whereby the county and township government actors, the Science administrator, and the Township administrator, being closer to and falling between the Bee broker and numerous secondary contacts, have high centrality. Responses from the two DNWs confirmed the results obtained from the three-centrality measure.

In the Compound fertilizer NW all four NW members responded that the SODE broker was in the central position because of his direct relationship with all partners. Additionally, the SODE broker had strong financial resources, key material supplying channels from abroad, and direct access to the market due to his distribution competence. The empirical evidence of question 15 and 34/36 of the interview guide all confirmed the theoretical measurements of the strong central position of the SODE broker.

Data obtained from the Biofertilizer NW similarly indicated the central position of the POE broker by degree measure. Here, however, the Science bureau considered himself as the center of relationship, during both formation and development phases, because of his local administrative status that was in line with the indication of closeness and betweenness measures.

Data collected from the interview showed that informants in the two INWs acknowledged that the State broker and the SOIE broker occupied the absolute, central positions in their respective NWs. However, they also disagreed with their (the brokers) ineffectiveness in handling both internal and external relations.

The indisputable central positions of the Seeds broker in the Hybrid seeds NW, and the SODE broker in the Compound fertilizer NW (as voted by the members in the two

NWs) explained that the two brokers also had direct access to the secondary contacts at the field levels. To elaborate, the SODE broker reached the county and township agricultural material retailers, and the Seeds broker had access to the support of their counterpart agrotechnical administrators in their respective regions. These direct accesses to key secondary contacts by the SODE broker and the Seeds broker further reduced their dependencies to the others, and, therefore, contributed to their central positions - despite the relatively high closeness and betweenness centralities of the NW members.

The empirical and theoretical analysis in this section, and verifications by the data collected from questions 15, 34, and 36 of the interview guide, collectively conclude that - in the NW groups of this research - the brokers are the most central actors within the boundaries of each NW due to their control of key resources or positions of command. This centrality within the NWs enables the brokers to enjoy which consists of a position of power (degree), efficiency or independence (closeness) and ability to control or increase the dependency of the NW members (betweenness). However, when dealing with the system-wide properties of the network or extended NW relations, as the centrality of the NW members increase, so did the brokers' dependency on them. The satisfactory results achieved by the DNWs and SNWs were, to a great extent, due to the broker's appropriate handling of the dynamic interdependency relationships between the partners, and the emphasizing of personal relationship and trust with their NW members. This, in turn, increased their support of the central leadership of the brokers within the NW.

In the two INWs, the brokers' centrality were characterized by their command power - facilitated by the SOE system's emphasizing less on relationship and trust building with the NW members than on **the vertical control** of its members activities. Consequently, with the closeness and betweenness centrality obtained from their direct connection to the extended NW relations (particularly at a transitional economic stage) the members of the two INWs engaged in non-cooperative and even competitive activities among themselves rather than operating under the coordination of the brokers, - there-by attempting **avoidance of control** by their corporate superiors - the brokers.

Taking into consideration the argument of Burt (1992), "structural holes" is a more important indicator of power and influence than centrality. Therefore, for gaining an in-depth understanding of the relationship between power and the NW participants, a later analysis in the coming section deals specifically with structural holes in the NW groups.

4.6.3.4 Structural Holes

The analytical process of this section consists of section 4.6.3.4.1, which analyzes the direct and indirect conditions which indicate the structural holes in each NW present in this study. The presentation then follows section 4.6.3.4.2, examining the NWs with two design principles of efficiency and effectiveness.

4.6.3.4.1 Cohesion and Structural Equivalence

This section uses the two empirical conditions: **cohesion** (concerns direct connection) and **structural equivalence** (concerns indirect connection) - as presented in section 2.4.3.2.2.2 - to examine the structural holes in each NW.

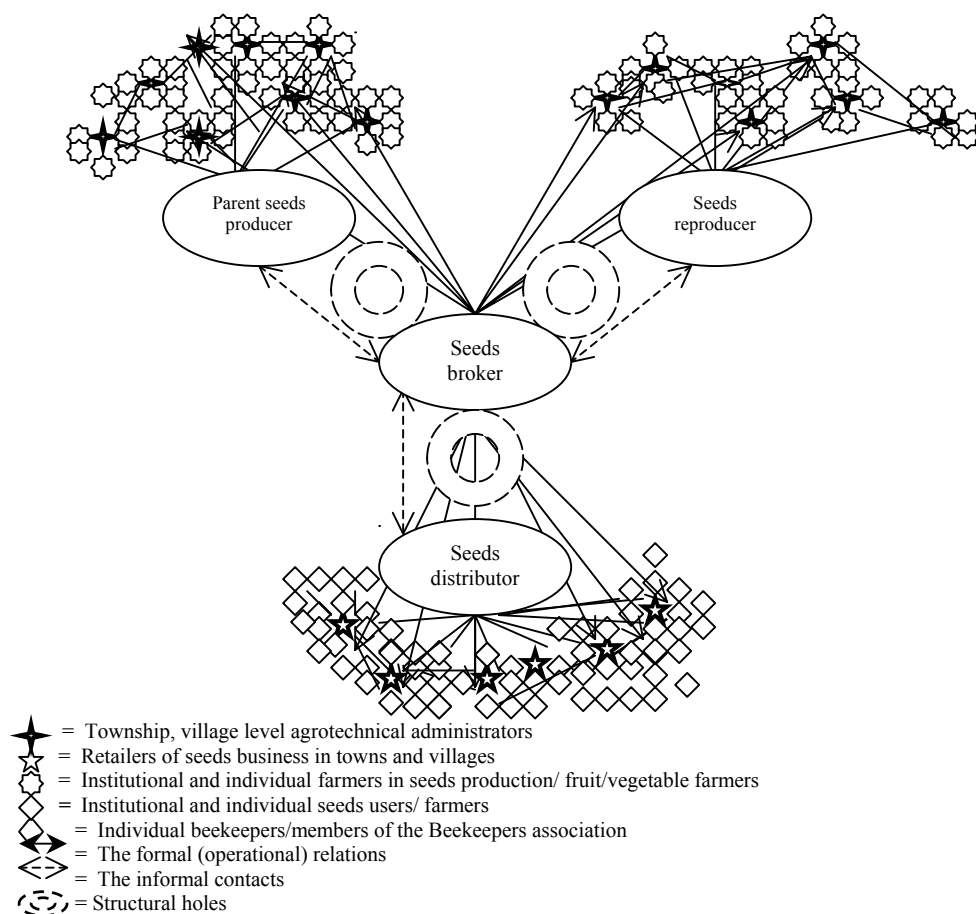
4.6.3.4.1.1 The Hybrid Seeds and Honeybee DNWs

Figure 39 and 40 show that, before the respective NWs were created, most actors had only direct contacts with the brokers in some of the limited cooperative operations and had no business contact with the other actors (the contact between the Science administrator and the Beekeepers association was not based on a business activity).

The right synergisms existed for the potential common interests between the actors in the two NWs to be harnessed for positive impact, but these actors were neither operationally connected nor strategically organized. The field operations of both seeds production and honeybee pollination service required great efforts in organizing a large number of farmers; and the organizing activities were ineffective and costly for the Seeds and Bee brokers if they endeavored to it by themselves.

The individual actors were only involved with their respective original activities, as presented in section 4.3, until the Seeds and the Bee brokers recognized the existences of the structural holes between the actors and the large number of farmer groups - and consequently took actions to fill them up by forming the respective NW organizations. Both the Seeds and the Bee brokers formed NW alliances with partners whom they had known well throughout the evolutionary processes.

Figure 39: The Hybrid seeds NW (before creation)



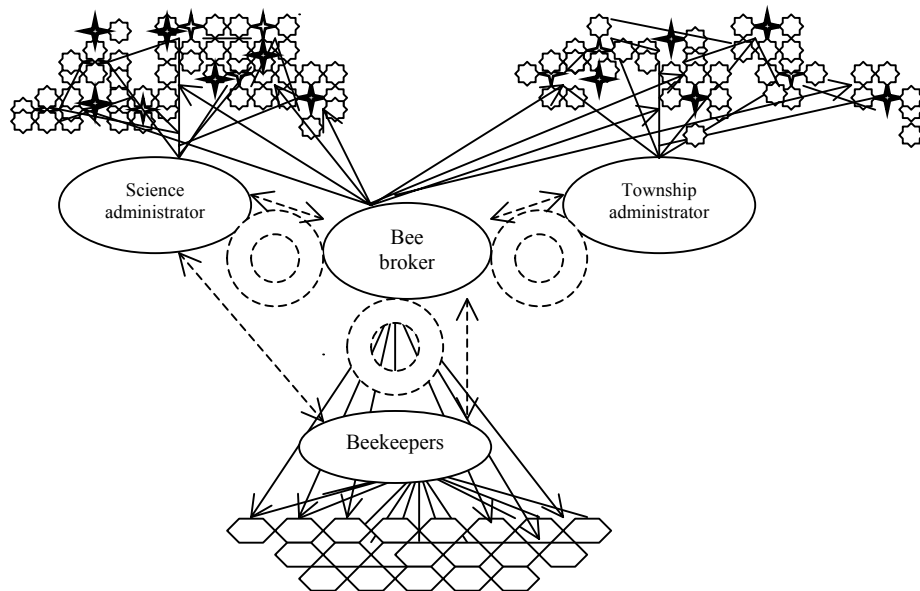
As explained in the case descriptions (see Appendix I, 1-6 and 2-6), the effective identification and combination of the actors in the two DNWs ensured the income of

valuable contributions of each actor to the NW business operation. The two brokers formed the respective DNWs, each having three nonredundant primary contacts in their individual NWs geographically located in deferent places.

Sections 4.6.1.1 and 4.6.1.2 presented how the Seeds broker organized the three originally separated primary contacts into the Hybrid seeds NW and coordinated their joint business activities.

Likewise, the Bee broker put the disorganized partners together into a coordinated field operation along the steps of pollination service process. Furthermore, these contacts to the two NW brokers were not connected to each other at a primary level, nor did they reach the same clusters of secondary contacts (cohesion and structural equivalence criteria). Thus, instead of trying to reach a great number of farmers by the brokers themselves (which were proven to be both ineffective and costly, as illustrated in the Figures 39 and 40) by forming the respective alliances, the brokers concentrated on maintaining only a few relationships within the NWs and achieved results which were not possible if they had been done independently.

Figure 40: The Honeybee NW (before creation)

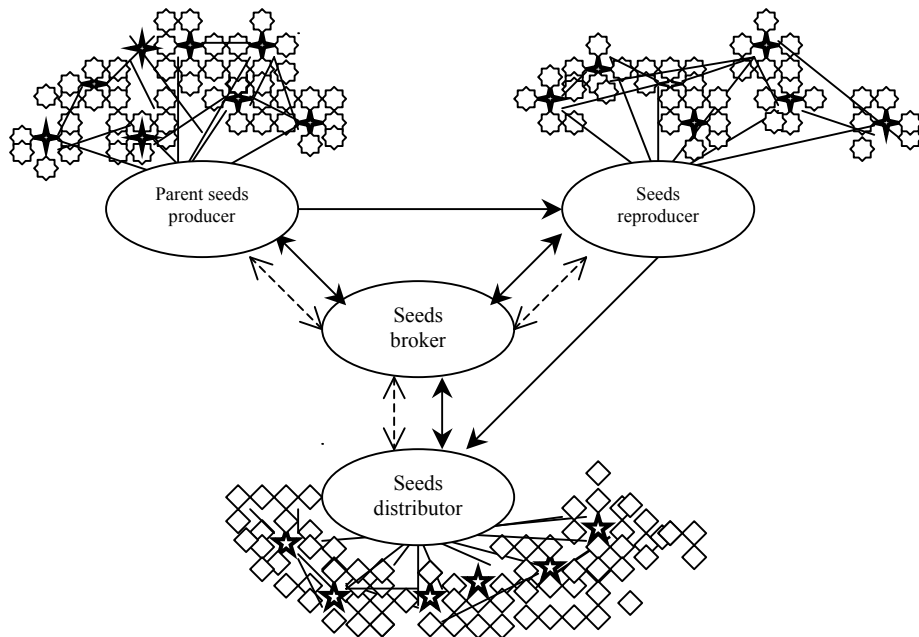


Symbols explanation is the same as Figure 42.

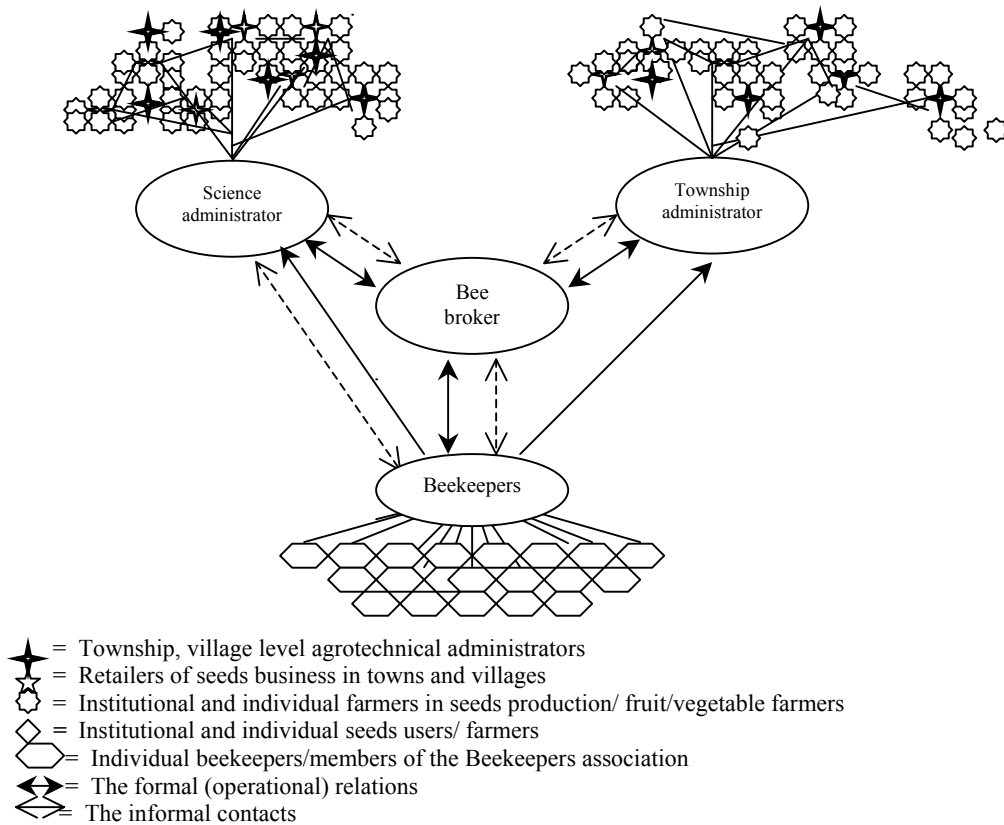
Sections 4.3.2.2.3 and 4.4.1 mentioned that in each DNW there were two county and township agrotechnical administrators with similar government functions. However, their roles in the individual NWs were additive, rather than overlapping, because each of them was responsible for a specific task in each of their separate geographical locations and for dealing with large numbers of farmers with different activities.

In addition, the Seeds distributor in the Hybrid seeds NW and the Beekeeper's association in the Honeybee NW played different, but unique, roles in each individual NW. The efficient structure of participants of the two DNWs directly contributed to their good performance results, as is shown in section 3.3.2.3.3.

Figures 41 and 42 illustrate the situation of each NW as results of the brokers' efforts of filling up the structural holes.

Figure 41: The Hybrid seeds NW (after creation)

Symbols explanation is the same as Figure 39

Figure 42: The Honeybee NW (after creation)

Data from the case descriptions (see Appendix I, 1-6 and 2-6) indicated that both NWs have plans for expansion which will lead to even further recruitment of new members with complementary resources and competences.

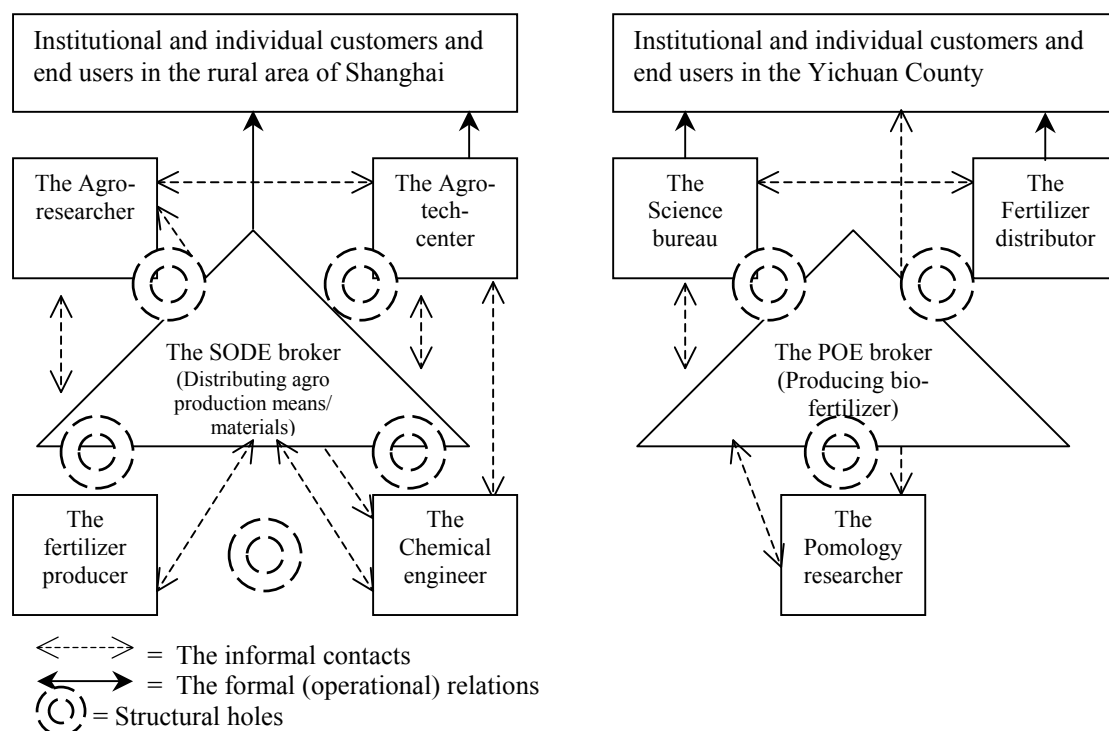
The expansion of the two NWs will not be simply a process of multiplying and establishing similar NW structures everywhere. For domestic market expansion, both the Seeds and Bee brokers are likely to focus on developing the Government and distributor partners in the newly targeted regions.

However, a new dimension for the Hybrid seeds NW is that the Seeds broker will have to search for new partners who have international business experience and contacts in the targeted foreign countries. Filling up these types of structural holes is a rather demanding task for the Seeds broker as a SORI actor, because it requires considerable skills, knowledge, experience and international contacts. For the Bee broker in the Honeybee NW, further expansion of the NW's business operation requires management large-scale business operation experience and various new relationships. Again, this seems beyond the Bee broker's ability as a research institution. A solution to this particular issue is proposed in section 5.4 of Chapter 5.

4.6.3.4.1.2 The Compound Fertilizer and Biofertilizer SNWs

Unlike the DNWs, many actors in the Compound fertilizer and the Biofertilizer NWs knew each other from previous informal contacts, though they may have had no formal business relations between them. The SODE and the POE brokers recognized the structural holes among the various actors, in relation to the business opportunities, and subsequently initiated the formation process of the respective NWs. Figure 43 illustrates such relationships between the various actors before the NWs' formation.

Figure 43: The Compound fertilizer and the Biofertilizer SNWs (before creation)

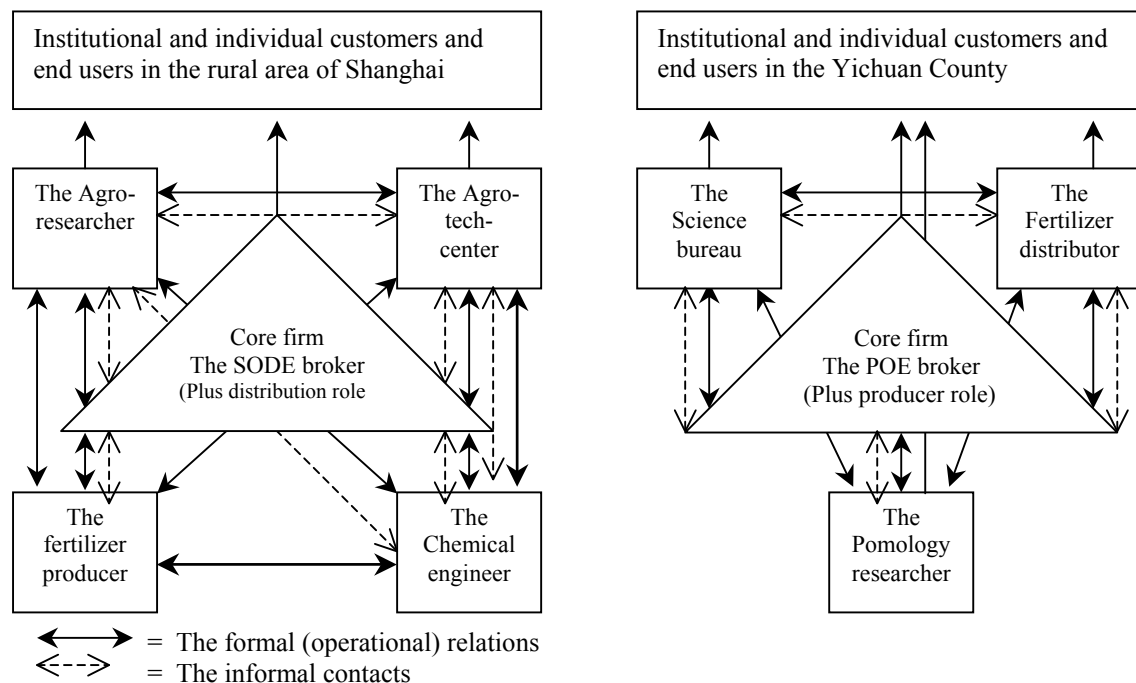


Referring to the evolutionary process of the Compound fertilizer NW, as presented in the case description (see Appendix I, 4-6), one might think that a JV form alliance between a strong distributor and a fertilizer manufacturer would be just good enough to develop the mixed compound fertilizer business without involving several other actors. However, the SODE broker (based on his market experience) believed that, as

a distributor, influential supports from the government, researcher and technological institutions were needed to effectively manage the challenging agribusiness. From among several potential partners who had unique strength in relation to his strategic objectives, the SODE broker identified disorganized relationships and convinced them to form the Compound fertilizer NW. Consequently, ties between the partners were formalized in a relatively tight coupling system. The SODE broker had direct connection with the four primary contacts in the NW, and the county level based agrochemical and fertilizer retailers outside the NW. The Agro-tech center had its agrotechnical extension networks in each county, while the Chemical engineer and the Agro-researcher were respectively linked to their relevant contacts of the chemical industrial administrations and agricultural science and research academies at central and provincial levels. Such indirect contacts are sometimes important for the NW, as is evidenced by the three partners' contributions in obtaining government's approval of the NW organization during the formation phase.

In the Biofertilizer NW, the formational process was very different compared to that the Compound fertilizer NW. In order to penetrate into a remote market, the only effective way the POE broker believed to be effective was to cooperate with all local Government partners who had influence on the farmer populations and local distribution networks. The POE broker, therefore, first established friendly ties with the Science bureau who then introduced the Biofertilizer distributor into the NW. In consequence to the brokers' successfully filling up of the structural holes between the manufacturer, Government, and technical influencers and distributors, each of the partners in the Biofertilizer NW played different and effective roles in the joint business operation. Figure 44 illustrates the situation of the two SNWs after their formations.

Figure 44: The Compound fertilizer and the Biofertilizer SNWs (after creation)



Under cohesion criterion it seems that most of the actors in the two SNWs are redundant because of their direct connections between them. However, they are **not** redundant in terms of their diversities of relations, complementary resources and

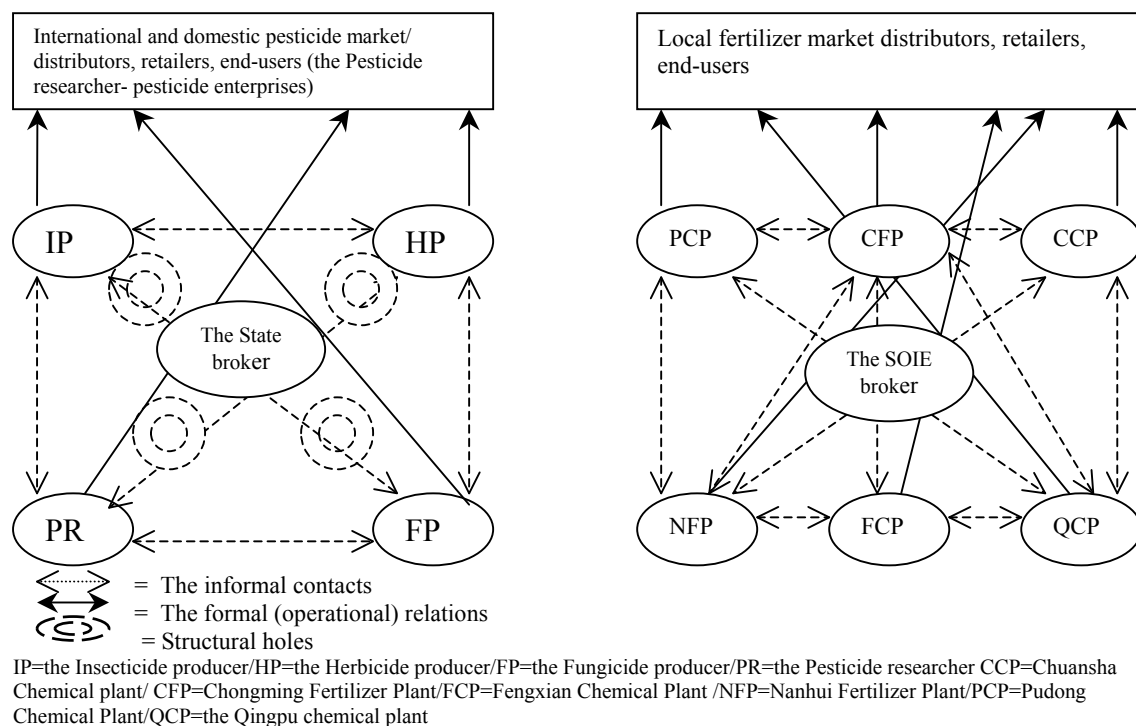
competences and the different types of benefits they brought into the NWs. On top of all, the structural equivalence condition indicates that the secondary contacts reached by the Science bureau and the Biofertilizer distributor are not the same clusters of contact. The Science bureau reaches township and village administrators and the Biofertilizer distributor deals with the agrochemical and fertilizer retailers in township and villages. Finally, **at the end users level, the contacts are complementing to each other's activities rather than overlapping.**

Since both SNWs are at relatively early stages of development it is assumed that, for a considerable period of time, the brokers in the two SNWs are likely to focus their efforts on stabilizing the upper and down streams operational processes. Further developments, such as new product introduction in the Compound fertilizer NW and market territory expansion in the Biofertilizer NW, may require the brokers to discover and fill up new structural holes.

4.6.3.4.1.3 The Agrochemicals and Ammonia INWs

The four participants of the Agrochemicals NW (the Insecticide producer, the Herbicide producer and the Fungicide producer and the Pesticide researcher) were separate operational units within the corporate structure of the State broker before the formation of the NW organization - as shown in Figure 45. As presented in the case description (see Appendix I, 6-6), all actors had known each other, and some of them had unpleasant feelings with each other due to previous experiences. The situation of the Ammonia NW, as far as structural holes are concerned, was problematic from the outset of the NW formation. As Figure 45 illustrates, all actors produced and supplied the same type of product to the same market and business in general was declining due to the environmental factors as presented in 3.3.2.3.2 and 4.2. All of the actors had known each other through both cooperating and competing activities.

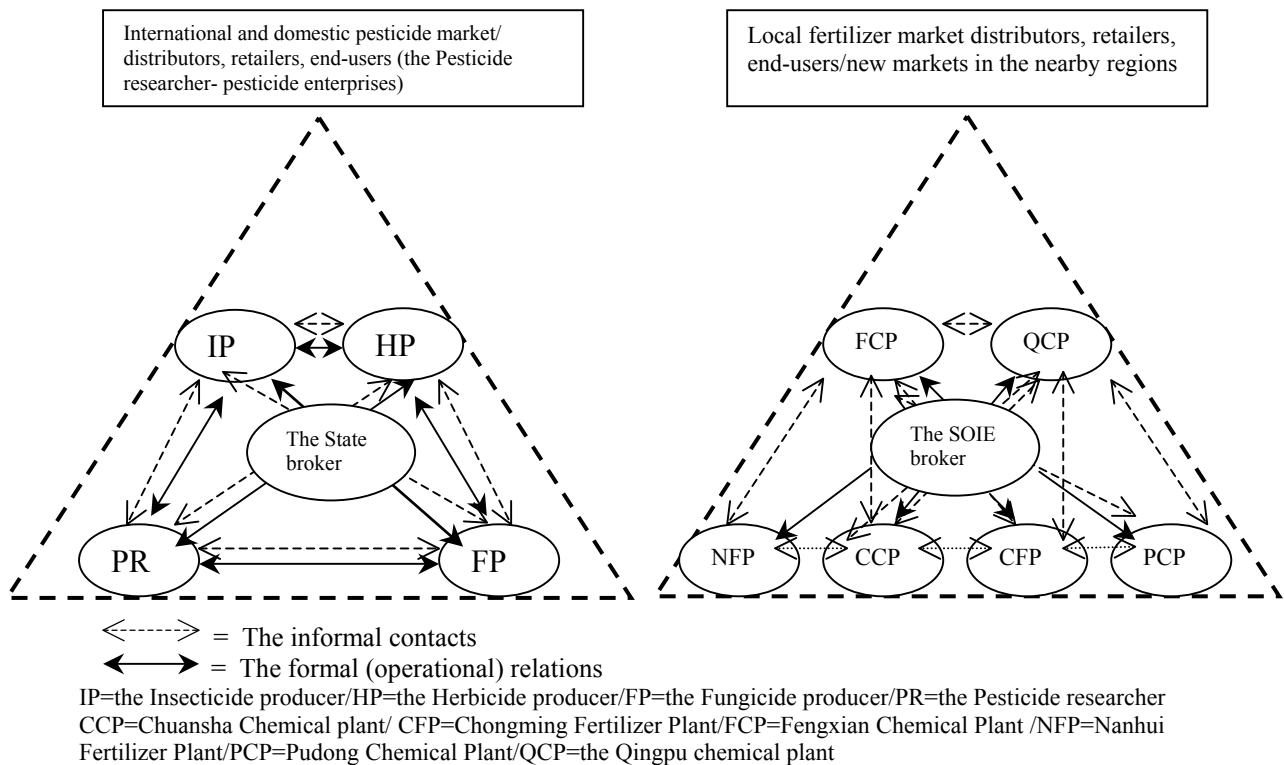
Figure 45: The Agrochemicals and the Ammonia INWs (before creation)



With respect to the objective presented in section 4.4, the State broker recognized the synergetic relations between the three different pesticide producers and one pesticide researcher for building up the strategic position, and, therefore, initiated the formation of the Agrochemicals NW. In this context, the most significant structural holes were identified by the State broker. However, there were only weakly filled with regard to the human relationships between the participants. According to the expectation of the State broker, in the newly established NW organization, the basic activities of the partners such as R&D, production, marketing, material management, supply, information management, external communications, sales, licensing and so on, should be operated under an internally coordinated mechanism to achieve the efficiency of the NW organization. But this arrangement was not honored by the NW members in reality, as presented in the case description (see Appendix I, 6-6). Though having the strong “hardware” of a technically feasible NW structure with all the necessary elements for success, the State broker could not deliver the expected results because of his failure in handling the “software” aspects of interpersonal relationships.

As explained in section 4.4.4.3, the SOIE broker’s objective of forming the Ammonia NW was aimed at reducing internal competition among the six producers through a centralized marketing coordination mechanism. Approaching an oversupplied ammonia fertilizer market with a NW formed by many redundant actors having complete similarities of resource and activity, gave no meaningful structural holes to be filled up by the SOIE broker in the first place. As explained in the case description (see Appendix I, 6-6), the NW was formed in the middle of the restructuring process of further plants closures and business diversification. Figure 46 shows the intended efficient structures for the two INWs by the State broker and the SOIE broker.

Figure 46: The Agrochemicals and the Ammonia INWs (after the NWs creation)



In reality, instead of reducing previous redundant contacts to similar secondary contacts in the market (as shown in Figure 46) the NW participants continued to

practice as they did before the NW formations. The theoretical analysis indicated that in the two INWs, and particularly in the Ammonia NW, a **combination of cohesion and structural equivalence** existed because the primary contacts were connected with each other within the NWs along with the secondary and further mutual contacts of distributors and users outside the NWs. As such, the contacts were both horizontally and vertically redundant.

Under these circumstances the partners operated with each of their own individual channels with the same external contacts instead of taking advantage of the NW resources- concentrating on a few consolidated lines to the external relationships and saving the resources and energies for improvement of other areas. Internally, instead of cooperating, the NW member's competed with each other as presented in the case descriptions (see Appendix I, 5-6 and 6-6). Such multiplying operations were ineffective and costly. Consequently, the Agrochemicals NW failed during its development phase. And the Ammonia NW, though surviving, was in a rather difficult situation. As for the later, only by further restructuring and diversifying of six producers' the business would the broker be able to create a new situation with rich structural holes to be organized into an efficient operation.

4.6.3.4.2 Efficient-effective NWs

Each of the four brokers - the Seeds broker and the Bee broker of DNWs and the SODE broker and the POE broker of SNWs, selected their **primary contacts** - the NW participants in their respective NWs. The formation of NW alliances with these partners was largely based on the good experiences in previous cooperation, personal relationship and trust - as analyzed in section 4.6.3.1.2. Compared to the secondary contacts like township and village administrators, retailers, institutional and individual farmers and beekeepers, the primary contacts were easier to maintain because previous experience had proven that they honored interpersonal debt. Forming alliances with the right primary contacts ensured that the four brokers gaining would reduce efforts to maintain the cluster in the respective NWs. The efficiency principles were thus followed by the four brokers by their optimizing of structural holes. And in the respective NWs with nonredundant primary contacts, each reached great numbers of cluster of contacts and consequently enjoyed more NW benefits.

Regarding the second principle, **effectiveness** concerns the total yield of the NW and **nonredundant contacts** are regarded as the ports of access to the clusters of people beyond. In the environment of the Chinese agribusiness sector, many of the secondary contacts (like county, township and village administrators, distributors, retailers and, further down, the end users to the NWs) of this research were living in dispersed or remote areas - as described in the Biofertilizer NW case. To reach these targeted clusters and get them organized was difficult and costly, as was experienced by the brokers in the DNWs and SNWs. Thus, the development of each NW in this group depended largely on the effective operation of the primary contacts such - like the Parent seeds producer, the Seeds reproducer in the Hybrid seeds NW and the Science administrator and the Township administrator in the Honeybee NW, and the Science bureau and the Biofertilizer distributor in the Biofertilizer NW. In the Compound fertilizer NW case, the situation was slightly different mainly because of The SODE broker's direct market channels. However, the Agro-tech center's role of customer education for the new mixed compound fertilizer to the rural market was extremely important during the product launching time.

Data collected from question 23 of the interview guide presented, earlier in 4.6.1.4.2, reflects the broker's view and experience on the most important activities at the time NWs entered into the development phase. Most of the brokers responded to the question that: *“coordinating relationships among the partners and other stakeholders, strategic leadership of the cooperative activities, operational coaching and facilitating the cooperative arrangement, new business development and developing new strategies were the most important activities after the NW's formation.”* The responses from the informants were, therefore, in line with the effectiveness principle.

By forming cooperation with partners having a maximum of nonredundancy primary contacts and diversified resources and competences, each of the four brokers from the DNWs and SNWs had the largest volume of structural holes between his contacts which functioned as ports of access to a great number of secondary contact clusters. Consequently, the actors (and in particular the four NW brokers- the Seeds broker, the Bee broker, the SODE broker and the POE broker) enjoyed more NW benefits of information, opportunities and as well as warnings of impending disasters.

In the Agrochemicals NW the four primary contacts were selected based on their complementary resources and competences. In addition to the efficient combination of the three different pesticide production lines and an R&D base, one of the operational advantages (as a result of the creation of the NW) was the design of an efficient marketing structure. The new group structure focused on one marketing team who dealt with bringing comprehensive and complementary product lines of insecticide, herbicide and fungicide to distributors who usually carry a structure of all type of pesticides and other agrochemical products. This avoided the previous overlapping practice of three marketing teams approaching one customer. Consequently, the yield of the structural holes could be maximized. If the NW strategy had been implemented according to the direction outlined by the State broker, the agrochemical NW could have become a strong market power in the agrochemical industry. However, this was not the case. Due to the internal relationship problems between the key management team-members (who represented each NW participant) and the State broker's failure to resolve the conflict situation, the NW partners ignored the coordination rules of the group and separately contacted customers from the same cluster. With the NW partners' continuous redundant operations, the NW failed to meet both efficiency and effectiveness principles. Consequently, due to the same relationship problem, the originally intended internal market concept of the transferring of technologies between the Pesticide researcher and the three production actors, as well as the cost-efficient production and formulation swapping operation among the three manufacturing partners, did not materialize.

Contrary to the situation in all of the other NWs in this study, the Ammonia NW was almost completely redundant at both primary and secondary levels. As part of the initiatives of the ZYCC group's restructuring process, as explained in the case description (see Appendix I, 6-6), the marketing operations of the six primary contacts in the Ammonia NW were merged into a centralized marketing NW organization. One of the major objectives of the SOIE broker was to bring internal competitive activities into a coordinated operation. Nevertheless, the strategy had gaps between the redundancy of resources and the activities of the NW partners on the one hand, and an oversupplied ammonia fertilizer market on the other. Without further restructuring of the six fertilizer plants and diversification of their business, the six

partners would remain in a redundant situation which caused continuous internal competition between the NW participants. As a result the clusters of contact in the Ammonia NW were almost completely redundant at both primary and secondary levels - given the NW poor structural holes, and the NW benefits.

4.7 ROLE DISTRIBUTION AND ACTORS' BEHAVIOR DURING THE NETWORK BUILDING PROCESS

This section explains, empirically, the various roles attributed to the different NW participants and how their roles and behavioral patterns affect the outcomes of NW building process.

The presentation and analysis of this section are organized into two parts. The first part consists of sections 4.7.1 and 4.7.2, dealing with the roles and behaviors of the different types of NW participants during the NW building process. The second part, section 4.7.3, devotes itself to focusing specifically on the roles and behavior of the brokers in the NW groups along the different developmental phases of the NW building process. Following the examination on the *actual* roles and behaviors of the actors, section 4.7.4 presents the NW participants' preferences on the types of brokers - according to data collected from the survey process.

4.7.1 Roles of the NW Participants during the NW Building Process

4.7.1.1 Role of the Government Actors

Sections 4.3 and 4.6 presented that the Seeds reproducer, the Science administrator, the Township administrators in the two DNWs, and the Agro-tech center and the Science bureau in the two DNWs were the State agrotechnical administrators. Their primary activities were administrating the rural agricultural science and technology extension work in relation to the social and economic development in their respective counties and towns. Data collected showed that the government actors in the four NWs were important players with roles of '**enabler**' and '**facilitator**' during the NW formation phase '**organizer**', and '**influencer**' during the development phase. The informant's responses to question 5 of the interview guide demonstrated these roles played by the government actors.

Question 5 of the interview guide was designed to find out what roles the government actors played and how they played these roles in the NW building process: "*what assistance or support have been provided by the external/ individuals, organizations and government agencies in connection to the formation of this cooperative arrangement?*" The government actors' roles as *enabler* during the formation phase included providing financial, physical (with exception of the Science bureau), and political support to the NWs - as the data presented in section 4.6.1.1.1. Additionally the government actors at county level also played the role of '*facilitator*' for the NW's formation in terms of introducing potential members to the NW brokers. Data collected from question 5 of the interview guide showed facts in this particular regard. As Mr. Chen, the Science administrator in the Honeybee NW said: "...we have introduced the Beekeepers association to the Bee broker, and provided financial supports to the activity." A similar case was found in the Biofertilizer NW, as Mr. Liu, director of the Science bureau - the county government actor, described: "...we

reported the subject to the County government and the idea was welcomed ... I introduced the Biofertilizer distributor into the cooperation of fertilizer marketing.”

During the development phase, the government actors were the ‘organizers’ - mobilizing a great number of local field forces and end users for the NW operation and because of their governmental status; they also played the role of ‘influencer’. This is seen from the Seeds distributor in the Hybrid seeds NW: *“The county government supported the introduction of the new seeds by organizing field demonstrations and promotional rallies for the distribution service networks and farmers in the county.”* Likewise in the Honeybee NW, Mr. Xu the Township administrator, explained: *“...We organized farmers to watch the field demonstration and trial results. Further promotion had been carried out via the local and Beijing TV stations.”* In addition the two government actors (the Parent seeds producer and the Seeds reproducer) also operationally coached and facilitated local cooperative activities between the NW partners when the NWs entered into the development phase - conforming with Mr. Liang (the Parent Seeds producer) and Mr. Xiang (the Seeds reproducer) response to question 23.

The provincial industrial administrators (the State broker and the SOIE broker) played brokers’ roles in the two INWs. (This shall be discussed in section 4.7.3, roles and behavior of brokers). The State and local Government departments played strong roles of ‘enabler’ and ‘facilitator’ by providing favorable policies and treatment for setting up the two INWs. As Mr. Tian in the Ammonia NW said: *“The government provided a special three year fund to us for the purpose of restructuring process.”* Mr. Gao, former deputy director of the Agrochemicals NW added: *“...the Economic Commission of State Council, MCI, Municipal Government, the State broker supported the establishment of the center by granting the Agrochemicals NW import and export licenses, and allowed it to be publicly listed in the Shanghai stock market.”*

This section concludes that the roles of ‘enabler’ and ‘facilitator’ during the formation phase and ‘organizer’, and ‘influencer’ during the development phase, as performed by the different government actors, are important to the successful formation and development of NW groups investigated in this research.

4.7.1.2 The Role of the State Owned Enterprises – the SOE Actors

4.7.1.2.1 The State Owned Research Institutions – the SORI Actors

As explained in section 4.3, the State’s new policy encouraged research institutions to engage in market relationships to sources of finance through commercial exchange activities rather than relying solely on the State funding. With the country’s rapid economic development, the SORI actors found themselves increasingly welcomed by enterprises hungry for new technology and products. Consequently, more and more SORI actors have started to participate in alliance co-operations with industrial partners, thus playing important roles. In the NW groups of this study, the SORI actors also played important roles in the technological areas of each NW. The two SORI brokers, the Seeds broker and the Bee broker (in addition to their broker roles) also performed functional roles as ‘**technology provider.**’ They were responsible for developing and controlling the key technical domains of the business process. Furthermore, due to the nature of their profession, their roles were of particular importance to the technical **innovation** of the NWs.

In the Compound fertilizer NW, the Agro-researcher was responsible for a **‘product manager’** role, while the Chemical engineer’s role was to make sure that the **‘production process’** operated with maximum efficiency. As presented in the case description of the Compound fertilizer NW (see Appendix I, 4-6), during the formation phase the NW members, led by the broker, participated in the project **‘feasibility evaluation’**.

Furthermore, the two SORI actors contributed to the NW’s formation by providing technical advice to the industrial authorities and by obtaining the approval of the new production site. In the Agrochemicals NW, the Pesticide researcher was the only research actor whose task was responsible for the group’s **‘research and development’** function.

Finally, in the Biofertilizer NW, the Pomology researcher role was to conduct the **‘technical promotion’** of the product manufactured by the POE broker. The SORI actor’s roles were important for the technological innovation and product development throughout the different phases of NW building process.

4.7.1.2.2 The State Owned Industrial and Distribution Enterprises – the SOIE and SODE Actors

Section 4.3.3.1 identified eleven SOIE actors from the two INWs. The actors belonging to this group were commonly characterized by their activities of **manufacturing and supplying** agrochemical and fertilizer products under the same SOE chemical industry administrative system.

The SODE broker in the Compound fertilizer NW also played the functional role of **‘distributor’** - moving the NW’s output to the agribusiness market in addition to his role as a broker (to be dealt with in 4.7.3). The Seeds distributor in the Hybrid seeds NW focused on distributing seeds produced by his NW to the local market. The roles of the SODE actors were especially important during the operational stage when the NWs start to supply their products to the market.

4.7.1.3 The Role of the Private Owned Enterprises – the POE Actors

The four POE actors were from the DNW and SNW groups. In the Honeybee NW, the Beekeepers association played the role of **‘material supply’** for the bee colonies of the NW’s pollination service operation. While in the Biofertilizer NW, in addition to his broker role, the POE broker was mainly responsible for **‘production process and quality control’**. The local Biofertilizer distributor’s task in the NW was to take care of **‘product distribution’**. Together with the government actor, the two POE actors jointly conducted **‘product promotion’** activities. Finally, the Fertilizer producer in the Compound fertilizer NW played the role of **‘production management’** - which covered all aspects of the production activities within the NW.

The POE actors, as a newly developed sector in China’s transitional economy, not only participated in strategic alliances with the Government actors and SOEs, but also played important roles in the various NWs.

The NW members played those functional roles directly linked to their own competence and resources. The actor’s roles of the DNWs and SNWs, as well as the

Agrochemicals NW, were complementary to each other in the value chain of the NW business process. However, in the Ammonia NW, since the actors were involved in similar activities their roles in the NWs were similar as well. Table 49 presents an overview of the roles distributed by actor types in the NW groups.

Table 49: Role Distribution by the Different Types of Actors in the NW Groups

THE TYPE OF ACTORS IN THE NW GROUPS			THE STRATEGIC NW BUILDING PROCESS	
			FORMATION PHASE	DEVELOPMENT PHASE
GOVERNMENT AGENCY ACTORS	Central and provincial level industrial administrators	MCI The State broker The SOIE broker	NW Creator Architect Enabler Facilitator	Lead operator Enabler Facilitator Influencer
	Provincial/ County/ Township level agrotechnical administrators	The Agro-tech center/ The Science administrator /The Parent seeds producer/The Seeds reproducer/The Township administrator	Enabler Facilitator Influencer	Organizer Influencer Rural agricultural science and technology extension
SOE ACTORS (State owned enterprises and organizations)	State owned industrial enterprises (SOIEs)	The Insecticide producer/ The Fungicide producer The Herbicide producer	(Since the industrial administrators created the two INWs in a top-down manner, the participants had practically no roles to play in relation to the NW's formation)	Manufacturing and supplying agrochemical and fertilizer products
		The Fengxian fertilizer plant/The Qingpu fertilizer plant/ NFP/ CFP/ CCP/ PCP		
	State owned research institutions (SORIs)	The Seeds broker The Bee broker	NW Creator Architect	Lead operator Functional/ technical roles
		The Vegetable researcher / the Agro-researcher / /The Pomology researcher The Pesticide researcher The Chemical Center	Technology provider NW project feasibility evaluator	Product management Customer education/ technical promotion R&D of new products/ technology/innovation Production process/ quality control
		The SODE broker	NW Creator Architect	Lead operator Distribution of NW's seeds
	State owned distribution enterprise (SODEs)	The Seeds distributor	Assisting venture creation	Distribution of agricultural means and products
POE ACTORS (Private and collective owned enterprises and	Collectively owned association by the private apiculturists	The Beekeepers Association	Assisting venture creation	Providing bee resource and operating honeybee pollination service under the Bee broker's coordination
	Privately owned industrial enterprise	The POE broker	Brokers- Creators Architect	Lead operator Functional/ production/ supply
	Privately owned distribution enterprise	The Biofertilizer distributor	(Joined the NW after formation)	Distribution of NW's biofertilizer
	Privately owned Taiwanese industrial enterprise	The Fertilizer producer	Assisting venture creation Project feasibility evaluation	Production /manufacturing compound fertilizer

4.7.2 Behaviors of the NW Actors

The preceding section identified actors' roles in the NW groups- focusing on the question 'how did the actors perform their roles during the NW building process have

direct consequences to the outcomes of these NWs?’ This next section will concentrate on examining the actors’ behavior during the different phases of the NW building process. The causal factors of the different behavior patterns such as culture development, personal relationship, and trust, are the focal areas to be analyzed.

4.7.2.1 Cooperative and Competitive Behaviors

Section 4.6 introduced that various actors in the NW groups of this study, especially in the two SNWs and the two INWs, had past knowledge and experience with their present partners before the formation of the alliances. Some of the actors collaborated with each other, while others competed with each other, while still others did both - all of this during the NW’s formation and development phases.

In the NW groups of this study, the actors in the DNWs and SNWs represent cooperative behaviors between partners, while the actors in the two INWs represent the non-cooperative or competitive behavior between partners. The following sections elaborate both types of actor behavioral patterns and their impact on the success or failure of the different NWs.

4.7.2.1.1 The Hybrid Seeds and Honeybee DNWs

As presented in section 4.6.1.1.2, the participants in the two DNWs acted congruently and with good cooperative spirit and efficiency in carrying out a series of differentiated tasks in the value chains of the hybrid seeds production and honeybee pollination business – all under the overall coordination of the two brokers.

One characteristic of these actors’ cooperative behavior, in both NWs, is that the NW members respected the valuable roles played by each other. Each individual actor believed that his own role was important to the success of the business, but appreciated other partner’s indispensable roles, too. These mutual respectful attitudes between the partners are evidenced by data collected through question 34 (member) and 36 (broker) of the interview guide. To the question asking the informants about the firms and individuals who maintained the most important relations in the NW organization, Mr. Wang, the Bee broker replied: “*the Township administrator, the Science administrator and us*” (are all important together). The government administrator of the Township administrator Mr. Xu agreed with this: “*both the Bee broker and the Township administrator are important; it won’t work if one is missing.*” Both actors respected the importance of their partners. This mutual respect and understanding between the partners was developed on the basis of good cooperation experiences, and trusting relations at both organizational and individual levels.

4.7.2.1.2 The Compound Fertilizer and Biofertilizer SNWs

During the formation process, the SODE broker and his four partners encountered difficulties in obtaining approval for the project. It was largely due to each partner’s willingness to cooperate, and each of their valuable contributions, that a new cooperative arrangement was successfully established. The NW was in the process of implementation, as they had planned, and all partners involved appreciated the interdependency relationships linked to complementary roles played by the other NW members.

In the Biofertilizer NW, a cooperative model of “supplier + Government + distributor + farmers” was formed according to the partner’s complementary competences and interests. The broker felt satisfied with the beginning successes of the NW and appreciated the roles played by the local partners - who in turn also felt that a good communication and friendship existed among them. When asked about the success factors of their cooperation, Mr. Hao, the POE broker replied: *“understanding, being supportive, and sharing are the major factors to the successful cooperation among our three partners”* (see questions 51,53,55 of the interview guide). As in the DNWs, a willingness to cooperate and the cooperative behavior of the NW members in the two SNWs resulted in a good initial performance.

4.7.2.1.3 The Agrochemicals and Ammonia INWs

As introduced in section 4.6.1.3.1, the formation of the Agrochemical NW was completed smoothly and rapidly because of strong government support. However, as the group moved into the operational phase mistrustful relationships between the management team members, inherited from the past, led to increasingly non-cooperative behavior between the partners. Data collected (see Appendix I, 6-6) provides evidence of such behavior. For example the Insecticide producer, instead of unitizing the internal resource of the idleness of the Herbicide producer’s facilities, redundantly invested in a new 2,000-ton capacity herbicide formulation line. Likewise the Fungicide producer, instead of utilizing the Herbicide producer’s facilities, outsourced the work without internal coordination. Furthermore, because of the group’s failure in developing new products and paying technology transfer fees the Pesticide researcher then transferred its new technology to outside firms. The relationship was further complicated by resentments and complaints about the appointment of the company president and, consequently, small coalitions were formed between individuals within the management team. In a situation where no partners in the management team respected the internal authority of the president (and the passive behavior of the State broker) coupled with external depression in market condition, the Agrochemicals NW fell apart shortly after its formation.

The six small fertilizer plants under the SOIE broker had had a long history of competing with each other through price wars and dumping activities. By forming the Ammonia NW the SOIE broker created a unified supply position in the region. The objective was to stop disorderly competition among the members by coordinating their activities into a resource sharing cooperation. Internally, The GM and his team tried to improve the members’ operational capabilities, while externally initiating new business arrangements with key distributors. However with the continuous existence of oversupply problems in the fertilizer market, the shortage of financial resources and the internal SOE system problems, the NW members were increasingly found breaching the rules and reengaging in competitive activities.

The causes of the Agrochemicals NW’s failure during its development phase, and the current difficult situation the Ammonia NW encounters, may be partly explained by environmental factors - such as the limitations of the traditional SOE systems, the uncertainties created by the transitional economic process, and so on. Nevertheless, the non-cooperative attitude and competitive behaviors among the NW actors clearly deteriorated the performances of the two INWs. The question of what factors cause such behavioral patterns among the NW actors, in relation to the outcomes of the two INWs, shall be analyzed in the context of broker’s roles and behaviors in section 4.7.3.

According to survey results, the cooperative and competitive behaviors of the actors in the NW groups were influenced by relationship patterns between the NW participants. The next section presents the findings on how factors (such as culture, relationship and trust) influenced the actors' behavior during the NW building process.

4.7.2.2 Development of Culture, Personal Relationship and Trust

By using data collected by questions 6 (member and broker), 36 and 37 (member), and 38 and 39 (broker) the first part of this section investigates the cultural aspects between the NW participants. Explicitly answering the question, 'were there any cultural differences between the NW partners', and if so, 'how did the cultural differences and the actors' perception towards the cultural differences between themselves and their partners influence the NW building process?' Question 36 (member) and 38 (broker) asked informants "*have you found any cultural differences between you and other partners in this cooperative arrangement?*" Further, question 37 (member) and 39 (broker) asked the informants "*what types of problems have been caused by the cultural differences?*"

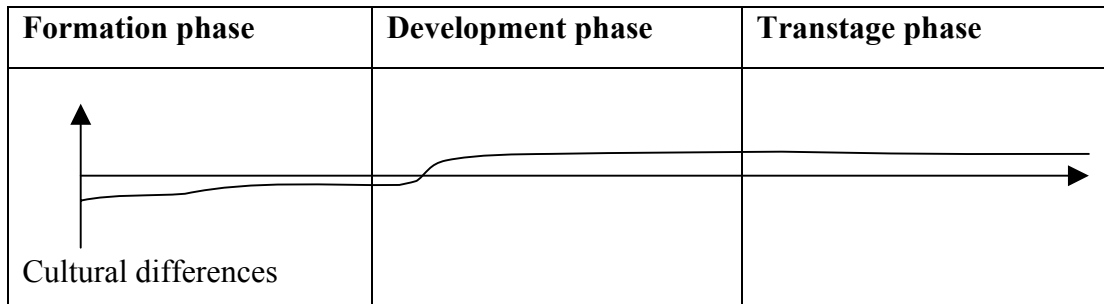
The second part of this section focuses on the importance of personal relationship and trust among the actors in the NW groups by examining data collected by questions 32 (members) and 34 (broker).

A further analysis - on how the variable *trust* is perceived by the different actors from the NW groups (in comparison with other relationship patterns and attitudes) was dealt with by question 35 (member) 37 (broker). These questions asked the informants to assess the importance of the variable in a five point Likert scales scheme (see Appendix XIV). Finally, question 54 (member) and 58 (broker) used the same method in asking all informants (n=26) to assess the importance of a **trustful relationship** between partners - in relation to the success of the NW cooperation.

As presented in section 4.3, all actors (including the Fertilizer producer) belonging to the NW groups of this study are Chinese companies operating within similar industrial sectors with similar social, political, economical, and cultural environments. The culture differences between the types of actors, as they are differentiated in this dissertation, may be less obvious than they might be at a cultural group level differentiated by nationalities or race. For this reason, the analysis of cultural differences in this dissertation is focused on the company level.

Question 6 has ten items where the informants indicated their preference opinions on cooperative partners. Among them, *compatible company culture* was considered as less important than other criterions such as *good cooperation track records with others*, *possession of key required resources*, *synergy in the same business*, *financial strength*, and so on. According to the responses, the actors in the NW groups generally perceived the cultural differences among the partners as insignificant during the formation stage. This can be explained according to the literature. Cultural differences normally are not fully evident at the stage of alliance formation. But eventually they become more apparent as the NWs start operating.

Figure 47 illustrates the gradual emergence of cultural differences among the actors during the NWs building process. That is, as the NWs moved into the development phase, the cultural differences between the actors became more obvious than they had been during the formation phase.

Figure 47: Cultural Differences during NW Building Process

This finding is empirically demonstrated by the informants' responses to question 36 (member), 38 (broker), 37 (member) and 39 (broker). As Professor Zhao explained: *"due to different organizational natures, cultural difference existed among the partners. We, as a research organization, respect a scientific attitude that is often perceived by the government partners as too rigorous. The government partners cared for economic benefits and political achievements however, tended to be less accurate for the operational details of the seeds production. The seeds companies focused more on profitability. In general, there were more complementary elements than conflict elements in the cultural aspects. The loosely linked relationship, to some extent, also reduced the exposure of potential cultural conflicts"* He further responded to question 39: *"we emphasized on overcoming shortcomings and bringing each other's initiatives into full play."* On this point Mr. Xiang, the Seeds reproducer, expressed his view: *"The partners have different understandings of the execution of the agreement from each of their own cultural points of view. The Seeds broker emphasized both social contributions and economic benefits, while the local partners emphasized more on the economic benefit aspects."* Mr. Liang, the Parent seeds producer, argued that cultural difference were not an issue in their cooperative relationship with the broker, *"because the common agricultural science activities have narrowed down the cultural differences."* In other words, he suggested that partners engaging in the same field of activities have less cultural differences. The Seeds distributor did not think that cultural differences were a problem at all. This may be explained by the fact that the SODE actor's participation in the NW's operational process at this stage was less exposed to relationships with other participants - since transactions were made only with the Seeds broker.

In the Honeybee NW, Mr. Xu, the Township administrator, clearly pointed out the differences between the government actors and the SORI actor: *"there were cultural differences. The Seeds broker was driven by economic benefits, while we as government, emphasized more on social aspects."* But, he further explained, *"we understood each other and there were no problem."* The Bee broker, Mr. Wang, neither saw the cultural differences as an immediate concern at the present initial stage of the development phase, nor ruled out their potential. Professor Zhao had a similar thinking: *"maybe due to our loosely coupled relationship, cultural aspects have not been exposed. So for the time being, we have not seen any issues caused by the cultural differences. It may well emerge in the future."*

In interviewing informants in the two DNWs, one noticeable finding led to an additional cultural aspect link. Professor Zhao, the leading player of the Hybrid seeds NW, was originally from the Anhui province where the Funan hybrid reproduction site is located. According to him, the Seeds broker's operation had benefited from many of his personal contacts serving at different local administrative offices as well as his knowledge of the local ways of doing things. It happened that the broker of the

Honeybee NW, Mr. Wang, had a similar personal background with the key pollination site, in the Yangzheng town, before he went to University some twenty years previous. This finding may be just a coincidence. However, it well explains that the brokers' knowledge about cultural environments is helpful to the successful handling of relationships with local government partners in their respective NWs.

The Agro-tech center for the Compound fertilizer NW was of the opinion that “*they* (referring to the broker and the Fertilizer producer) *emphasize more on profit. We do consider economic benefits to a certain extent, but our main interests are on the research results. We do not feel much cultural difference now, but maybe will in the future.*” He further described the cultural aspects in the Compound fertilizer NW: “*due to different backgrounds, quite large differences exist between the SODE broker, the Fertilizer producer (commercial) and us. Culturally we are closer to the Agro-researcher and the Chemical engineer (SORIs). There is no problem at present, but with the development of the NW and the economic changes, its importance to the partners may change as well, and this might lead to an emergence of cultural differences.*” Therefore, the emergent influence of cultural differences between the actors is just a matter of time.

Mr. Hao described the cultural differences in the Biofertilizer NW thusly: “*there were certain demographical cultural differences, such as urban versus rural, corporate versus family business, and enterprise versus county government department. But they have not influenced the cooperation so far.*” Although he did not explain why these identified cultural differences have not affected his NW's cooperation, the Biofertilizer distributor gave an answer on the relationship between the private actors and Government actors: “*although there is a cultural difference with the Science bureau, personal relations are playing a major role now.*”

Nearly all of the actors in the Agrochemicals NW disregarded the cultural differences, which was among the issues which influenced the Agrochemicals NW's outcome. As Mr. Lu said: “*we are all SOEs with similar cultural backgrounds.*” His view was shared not only by the three the SOIE actors, but also the Pesticide researcher - the only SORI actor in the group. “*There were no great cultural differences. Though we are a research organization that still has a SOE nature,*” said Mr. Guo, Pesticide researcher the director during the interview. The explanation of the actors' views over this variable in the Agrochemicals NW can be presented by referring to the analysis in sections 4.3 and 4.6, in which all the SORI actors operated within a same corporate system and engaged in similar activities. Under such circumstances, the actors' behaviors were predominantly influenced by a “SOE mono-culture,” rather than a multi-cultural pattern, as was among the actors in the DNWs and SNWs.

The actors in the Ammonia NW had many aspects in common with the Agrochemicals NW. They are all SOIE actors, administered by the State broker system, carrying out the same types of activities. Nevertheless, unlike the Agrochemicals NW actors (who were all urban-based and led by a management team represented by each member - including the GM), the six SOIEs in the Ammonia NW were based in different locations, structured into marketing platform organizations, and managed by the corporate organization. Consequently, Mr. Liu, the GM, acknowledged: “*cultural differences do exist. The NW management (referring to himself and his team) encourages a standardized operational style. But some of the members were not used to computerized management and modern management methods, so, instead, they practiced old styles of management and maintained a low efficiency HR force.*” To narrow down the said cultural gap in the NW some efforts were made by Mr. Liu, as he explained: “*we organized special courses to provide*

professional training and exchange of experience activities among the members. Likewise, we emphasized the implementation of standardized operations for example, the application of contract management.” When interviewed Mr. Zhou, the SOIE broker, interpreted the cultural differences in the Ammonia NW as being expressed in: *“the different points of view between the central planning economy and market economy,”* and *“the Marketing center’s providing guidance and training courses to the members, narrowing down these company cultural differences.”*

The findings concerning cultural differences in this section showed that, despite the fact that actors from the NW groups operate within a relatively homogeneous political, social, economic, and cultural environment, cultural differences between the NW partners existed. **Early stage of operation** and **loose-coupling systems**, to a certain extent, might have been the factors that played down the exposure of cultural differences. On the other hand, **good relationships, mutual understanding, and willingness to cooperate** between the partners helped to **narrow differences down**.

Having analyzed the cultural aspects in the NW groups, the second part of this section focuses on the development of personal relationships and trust among the NW actors. The variables of personal relation and trust were discussed somewhat in section 4.6.3.1.2, which dealt with the informal dimension of the NW cooperation. It explained that the actors had invested in the relationship with each other and developed trust at organizational and personal levels during the process of their social and business exchanges. This section revisits the subject in detail through data collected by questions 32 (members) and 34 (broker). These questions asked the informants: *“did personal relationship and trust continually play important roles in the operational stage as they did during the formation process?”*, while questions 33 (members) and 35 (broker) asked: *“What efforts have been made in maintaining and developing the relationship and trust among members in the operational phase?”* Finally, questions 35 (member) and 37 (broker) in order to learn the informants’ assessment its importance in relation to cooperation with their partners put the variable *trust* among twelve relationship patterns. The overall response from the NW actors is that: **personal relationship and trust are very important for the success of cooperation**. The following section presents the informants’ responses to the questions.

4.7.2.2.1 The Hybrid Seeds and Honeybee NWs

Professor Zhao explained how the Seeds broker and himself treated the subject in the Hybrid seeds NW: *“I have some personal contacts in the two bases (referring to the Funan and Shunyi sites). We made efforts to have more goodwill contacts between individuals and to increase transparency of the overall operation in order to strengthen the confidence and trust among partners.”* The Seeds reproducer, Mr. Xiang, added this point from his experience: *“In addition to a good working relationship, we also offered personal help to the partners, in case of need, and made visits to each other.”* To emphasize the important roles of the personal relations and trust during different phases of NW building process, the SODE actor Mr. Jiao expressed that: *“trust is as important as it was during formation phase. We try to communicate more often to each other, for example, by having dinner with the partners, making visits to the individuals....”* According to Mr. Liang, the Parent seeds producer: *“Personal relationship and trust become even more important during*

the developmental stage, because at the formation phase the relationship was limited to only a few contacts with each other. As for now (the operational phase), there is a consequence of investment involved. With the business going forward, the relationship and trust become more important." The Bee broker in the Honeybee NW, Mr. Wang, explained views based on experience from his NW: *"personal relationship and trust during the development phase became stronger than during the formation phase, because all partners understood more about the common objectives and saw the potential benefits. Our efforts included creating more contacts between individuals, showing concern to each other and understanding each other's needs and providing timely help."* The Township administrator, Mr. Yang, emphasized the importance of the matter: *"personal relationship and trust is essential. Without it we could not progress. We have adopted a positive attitude and take initiative to ask opinions of our partners."* Mr. Sun, the Vegetable researcher, expressed his point of view on the subject: *"We emphasize mutual communication, in order to sincerely and proactively maintain a cooperative atmosphere."*

In the two DNW, all informants interviewed have regarded personal relationship and trust as very important factors to successful cooperation.

4.7.2.2.2 The Compound Fertilizer and Biofertilizer SNWs

Similar to the responses obtained from the two DNWs, informants of this group of NWs all regarded personal relationship and trust as very important factors for the success of their NWs. Mr. Tian, from the Agro-tech center, expressed his view: *"...from our observations, they (personal relationship and trust) are very important. Personal relationships should be maintained. It is better not to change people, otherwise everything would have to start all over again..."* In the Biofertilizer NW, the personal relationship was extended to include even family members of each partner - as Mr. Zhang Feng the marketing manager of the POE broker said: *"personal relationship and trust are very important. Apart from the working contacts, partners have established good personal relationships – including even their families."* Mr. Liu, director of the Science bureau responded to the question with: *"if it was not because of the personal relationship and trust we have with Mr. Hao and Mr. Zhang, I would not have gone so far - since I was not obliged to do so ...We often visited each other to maintain the personal relationship and trust between us."* The distribution actor, Mr. Wu expressed his view and experiences in relation to the subject thusly: *"personal relationship and trust are always very important. I communicate more with partners during working contacts to strengthen individual relations, and we receive good commercial credibility as payment."*

In addition to similar comments given by the actors in the DNWs, the actors in the SNWs also emphasized on the continuity of personal relationship and trust maintained by managerial consistency of the NW manager.

4.7.2.2.3 The Agrochemicals and Ammonia INWs

In the Agrochemicals NW, data collected concerning the personal relationship and trust shows a clear gap between the views expressed by the NW members and the reality of their behaviors. According to former deputy manager Mr. Lu: *"the partners were always suspicious of each other... for example, the Fungicide producer constantly worried about being swallowed by the Insecticide producer before and during the formation of the group."* Examples about the mistrustful attitude and

behaviors among the NW members in the Agrochemicals NW were presented in the previous section 4.7.2.1 and in the attached case description (see Appendix I, 5-6). Data collected reflected similar views expressed by the respondents from the two INWs as from the DNWs and SNWs. For example, the former deputy director of the Agrochemicals NW Mr. Gao said: *“personal relationship and trust should be constantly important (throughout the entire NW building process).”* Mr. Lu, another deputy director, further explained this point based on his experiences in the same NW: *“personal relationship and trust were more important during the development phase, while during the formation phase it was relatively less important because the group’s formation was arranged by administrative means. In this aspect, it was quite deplorable in the Agrochemicals NW case.”* According to the answers from Mr. Guo, the former deputy director of the Agrochemicals NW and the head of the Pesticide researchers *“...Yes, personal relationship and trust are important. However (in the Agrochemicals NW) there was no particular work or effort made in this aspect....”*

From the Ammonia NW Mr. Zhou, the SOIE broker, said: *“personal relationship and trust during the development phase is as important as before (the formation phase) and this is the task of the Marketing center.”* Meanwhile, Mr. Liu, GM of the Ammonia NW, explained his experience and efforts made on the subject - particularly during the development phase: *“personal relationship and trust are even more important during the development phase. Because the interest aspects and various kinds of conflict became more obvious than they were during the formation stage... coordinating relationships between the individuals in leading and subordinate roles and big and small shareholders, all depended on a good relationship and trust base. In addition to the fixed date of exchange with partners, I visit the members regularly, having lunch with them, mediating conflicts between them, ...introducing new clients, banking contacts and doing business consulting....”* Mr. Zhu, manager of Qingpu fertilizer plant, who appreciated the importance of the personal relationship and trust complained, however, at the same time about the lack of efforts made among the members in this regard *“... Yes, personal relationship and trust are important, but nobody is seriously taking care of this matter except for Mr. Liu.”* Data collected from this group of actors concerning the subject of personal relationship and trust are similar to the actors’ responses from the other NWs – all of which are summarized as below.

Survey results showed that it is a common belief among all informants interviewed from the NW groups of this dissertation that **personal relationship and trust play very important roles during the entire NW building process**. Some informants believed that **personal relationship and trust become more important during the development phase than during the formation phase** (Liu, in the Ammonia NW; Lu, in the Agrochemicals NW; Wang, in the Honeybee NW; and Liang, in the Hybrid seeds NW). Data collected during the interviews has confirmed that personal relationship and trust was the base of cooperation in the DNWs and SNWs in which the brokers, in particular, made efforts in taking care of the relationship and trust development with partners **at both organizational and individual family levels**. The two INWs informants show the same strong sense of recognition of the importance of personal relationship and trust. However, the broker of the Agrochemicals NW made little effort in this respect. On the other hand, the present ongoing momentum of the Ammonia NW is largely maintained by the efforts of the broker trying hard to establish relationship and trust building with the competing members. **Overall, the**

different attitudes and ways of handling personal relationship and trust by the actors and the brokers, in particular, have a great impact on the behaviors of the NW participants - and explaining the reasons for the different outcomes of the NWs.

Furthermore, data obtained from questions 35 (member) and 37 (broker) showed that among all twelve listed items presented in section 4.7.2.2, **trust** has a score of 1.4 - indicating that the variable was considered the most important relationship pattern between the partners (please refer to Appendix XIV). The importance of trust between the cooperative partners demonstrated by the survey results of question 35 / 37 has quantitatively confirmed the experiences of the informants – as was demonstrated in their responses to questions 32 /33 (members) and 34/35 (broker). Further evidences obtained from the survey results of questions 54 (member) and 58 (broker) showed that NW participants considered **trustful relationships between the NW partners as a very important factor for successful cooperation** (refer to Appendix XV).

Having now gone through the roles and behaviors of the NW participants, section 4.7.3 moves the analytical focus on to the second part of this section – the broker roles and behaviors in the NW groups, and, specifically, what the tasks are and how they are carried out by the brokers in the NW building process as well as their impacts to the successful or unsuccessful outcomes of the NWs. Section 4.7.3 also deals with the broker roles and behavior.

4.7.3 Roles and Behaviors of the NW Brokers

Broker roles and behaviors are the focal analytical theme of this dissertation, directly responsible for providing explanations to the second and third research questions which concern why certain NW building processes succeeded while others failed – and how that tied into the broker role - all of this done to try to quantify how broker should behave in order to create and develop a sustainable NW organization.

As identified in the previous section, 4.3, the brokers' roles were played by all types of actors represented in the NW groups of this study. The roles and behavior of these brokers in the NW building process were preliminarily discussed, together with other actors in the NW groups in, section 4.6.1.1. The present focus is to treat the brokers' role and behavior – specifically, along the different stages during the NW building process. The objective of questions 10 and 23 (broker) were to identify broker's roles in the respective formational and developmental phases (the continual phase is explained in section 4.7.3.3). Simultaneously, how the brokers played their roles in the NW building process will to be analyzed based on data collected from questions 28, 29 (member), 30, 31 (broker) 48, 49 (member), 50, 51 (broker) 52, 53 (stakeholder) focusing on the variables of leadership style, conflict management style, NW politics, and information processing structure.

Following the presentation and analysis of the broker's roles and behaviors, section 4.7.4 presents data collected through questions 45, 46, 47 and 54 (member) 47, 48, 49, 50, 51 and 56 (broker) and 58 (stakeholder) with a special focal point of the NW participants' preferences on the types of brokers and their abilities in managing NW form organizations. The objective of this special section is to obtain some direct

inputs from the participants in the NW groups in relation to effective broker roles and behavior, which is linked to the explanation of the third research question.

According to the model developed by Snow, Miles and Coleman (1992), as illustrated by Figure 23 in section 2.4.3.4.1.2, the broker's role during the formational phase is that of an **architect**. When the NW moves into the development phase, the broker becomes a **lead operator**. Finally, during the third testing phase, the broker's emphasis shifts to a **caretaker role**.

Data collected from the NW groups showed some discrepancies compared to the literature in terms of defining the boundaries of each phase in the NW building process, and, likewise, the broker roles. To establish an analytical congruence between the framework and the findings of the empirical study, this section begins by clarifying the relationship between three variables used by both present literature and the current study: **1) the types of NWs, 2) NW building process and 3) broker roles during each phase of the NW building process.**

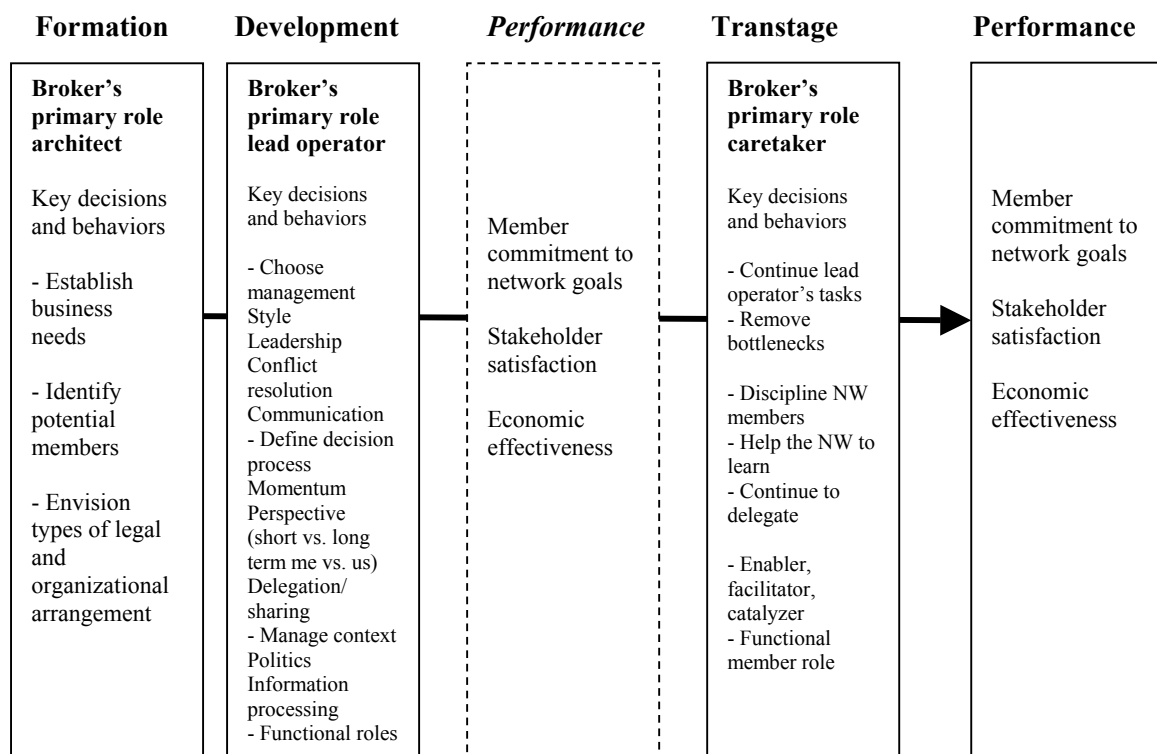
First of all, the typology of the three NW forms - INW, DNW and SNW - were judged as appropriate to be applied to the three pairs of NW groups in this study because of the close characteristics and operational logics compared to other NW types as presented in section 2.3.2. Concerning the second and third variables, the survey results demonstrated different findings. The six NWs experienced a similar life cycle consisting of a formational phase and a developmental phase. Firstly, during the **formational phase**, the brokers in the NW groups executed tasks combining all of the architect roles and some of lead operator roles - as illustrated in Figure 23. Namely, the brokers in the NW groups carried out tasks of a complete NW creation process - ranging from establishing business needs, designing strategies and concepts, identifying and formally connecting potential members, coordinating formation activities and relationships, and, finally, setting up the NWs by formalizing arrangements of relationships between the partners and commencing joint business activities. Therefore, the primary role the brokers played during the formation of a NW is that of a **'creator,'** which combined the entire architect's and some of the lead operator's tasks, as described by the literature. Second, during the **developmental phase**, as the NWs moved into the operational stage, the broker's task emphasized continuing to manage the internal and external relations, as well as designing the problem solving and decision processes of the lead operators' job - as described in the literature. In addition, they coordinated NW member's activities and relationships, implemented the NW strategies, and developed new business. Moreover, the brokers in the NW groups played some of the **coaching and enabling** roles of caretaker during the testing phase - as is illustrated in Figure 23. Finally, in the case of the DNWs and the SNWs, the brokers performed specific functional roles as ordinary NW members in the value chain process - based on each of their resources and competencies. Given that, the broker in the developmental phase of the NW building process in this dissertation is referred to as a 'lead operator,' (as Snow and Thomas, 1993).

At the time that of the collection and analysis of the data concerning this section, none of the NWs of this research had experienced a further stage than the development phase. As the NW building processes continue to evolve in both forms and functions, so do the roles of the brokers. Data collected from the informants which indicated some tendencies of the NW's future development, as well as possible broker role developments, are to be presented in the third phase of the NW building process. This new stage of the NWs is a part of the unfolding evolutionary process of the NWs'

development and the relationships between the participants. Based on the data collected from the investigation of NW groups, in relation to the transitional process of China's economic reform, the particular span of time which follows the development phase during the NW building process is referred to as the **transtage phase** in this dissertation. The word 'transtage' is used in space science to mean a middle step or trajectory change of the step rocket launching process (according to Ciba Kingsoft dictionary). The reason for using this word, as the continuation of the NW's development phase, is because it vividly parallels the crucial steps of a particular time-frame during the transitional process, upon which the NW groups of this study are based, and implies important strategic moves or redirections in the NW building process. The broker roles and behaviors during the transtage phase were divined by analyzing a framework of data collected through questions 2 (member/broker), 19 (member), 20 (broker), 22 and 23 (member) 24 and 25 (broker) and 25 (member) and 27 (broker). Data collected through these questions indicated some tendencies of possible NW group trajectory developments and further evolutionary relationship process patterns between the NW participants.

The primary broker roles played in this particular time-period were the *lead operator* role during the development phase, and the undertaking of emerging reforming or reengineering tasks during the NW building process – these depending on the internal and external situations of the NWs. It is therefore, assumed that the brokers may play the roles of enabler, facilitator, catalyzer, as well as those of an ordinary functional member. Figure 48 illustrates an updated model of relationships during different phases in the NW building process, as well as broker roles, behaviors, and performances in the NW groups.

Figure 48: Relationships among NW Phase, Broker Roles/ Behaviors, and Performance
(based on the empirical findings)



(Source: adapted from Snow and Thomas "Building NWs Broker roles and behaviors" in Lorange 1993:233)

After having brought the evolutionary phases of the NW building process into alignment, in connection to the primary roles and key decisions of the brokers in the NW groups and theoretical explanations of the broker roles, this section will begin to present and analyze broker roles in the NW groups along the developmental phases of the NW building process.

4.7.3.1 Formational Phase

4.7.3.1.1 The Hybrid Seeds and Honeybee DNWs

The actors who undertake the roles of brokers in the two DNWs are the Seeds broker in the Hybrid seeds NW, and the Bee broker in the Honeybee NW. Based on their own experiences gained from the field operation, both have realized the needs and advantages of cooperating with partners who have control of certain specific resources and competences which the two SORI actors did not have, and thus *initiated* the creation of the two DNWs. To find out the most important jobs to which the brokers devoted their efforts during the NW creation period, question 10 of the interview guide asked informants to select and explain, among a list of 17 major challenges during the formation phase, what they thought those jobs were. Professor Zhao, the Seeds broker responded: “*determining a good business opportunity*” and “*overcoming financial constraints*” were the major challenges during the initial formation stage of the Hybrid seeds NW. They first had to understand the market potential for their research result and then to convince potential partners and investors to finance the start up stage of the project. In the Honeybee NW case Mr. Wang, head of the company, explained that the major challenges they encountered were: “*working out a solid business plan and proposal*” and “*convincing potential partners to join the cooperative arrangement.*”²⁵ These challenges faced by the two brokers during the initial stages of NW formation, as presented in section 4.6.1.1.1, were mostly identical to the roles of *architect* as they are described by Snow, Miles and Coleman (1992).

The second challenge of the architect’s role, according to Snow, Miles, and Coleman (1992) is *identifying potential NW members*. However, in this aspect, both brokers did not spend much effort in searching out new partners, because of the long existence of cooperative relationships between the brokers and their present partners in the previous field trial operation of hybrid seeds and apiculture research activities. The strategic decision of forming an alliance with the County and Township government actors was made by the two SORI brokers based on the sound relationship and trust and complementary interests developed by an evolutionary process of cooperation.

Literature indicated that the third challenge of the architect role was the *design of cooperative arrangements* for the NWs. As presented in section 4.6.3.2.1, the two SORI brokers have designed models of cooperative arrangement linking partners by loosely coupled ties - thus allowing members to interact and accomplish highly differentiated tasks. And at the same time, each of the actors could maintain their independent legal entities and complete autonomous statuses. The relations between the partners are coupled on the domains of partial seeds production operation and honeybee pollination. The advantages of the loose coupling systems applied in the Hybrid seeds and Honeybee NWs have been already explained by both the Seeds and Bee brokers in their responses to question 20 (presented in section 4.6.3.2.1). As a result, the government and private actors welcomed the flexible cooperative structure

²⁵ For the SORI actors, it is not an easy job to develop a good business concept

designed by the brokers and, most importantly, enabled the two NWs to rapidly enter the operational stage. Since the NWs were formed with loosely coupled relationships, no particular legal or administrative formalities took place and, therefore, fewer costs were incurred.

In the Hybrid seeds and Honeybee DNWs, the two brokers fulfilled four major **‘creator’** role tasks during the formational phase: 1) establishing business needs for the NWs through articulating the vision of the NWs and demonstrating the advantages of joining the NWs to potential partners; 2) identifying NW members from existing cooperative partners; 3) designing the cooperative arrangement of the DNWs, and 4) bringing the design into reality by setting up the NWs and commencing joint business activities between the partners.

4.7.3.1.2 The Compound Fertilizer and Biofertilizer SNWs

In the SNWs group, the SODE broker and the POE broker played creator roles in forming the two NWs.

The major challenges in forming the Compound fertilizer NW, according to Mr. Chen the SODE broker, were **“convincing potential partners to join the cooperative arrangement”** and overcoming **“regulatory barriers.”** As explained in the case description (see Appendix I, 3-6) and section 4.3.2.1.2, the SODE broker initiated the NW creation process by first **establishing business needs** based on its strategy of stabilizing key product sources. To articulate the business vision of the NWs and to demonstrate the advantages of joining the NWs to the different actors the SODE broker organized special meetings with **identified potential partners** consisting of one POE actor, two SORI actors with one government administrator evaluating the project. Upon gaining overall positive responses from the participants, the SODE broker then followed up by proposing a **design of cooperative arrangement** to the potential partners, in the form of an equity share joint venture, and consequently convinced them to agree upon the equity participation structure. Hence, the SODE broker led the alliance formation process by assigning responsibilities to each of the potential members according to their strength, and then collectively worked out business plan. Additionally, the SODE broker was responsible for obtaining business licenses and allocating land for the production site, warehouse, and administrative facilities. When the alliance formation faced a regulatory barrier, as has been explained in the case description, the broker took the lead in **redesigning the cooperative arrangement** into a flexible structure, thus adapting to the requirements, and subsequently obtaining the necessary business licenses.

The situation of the Biofertilizer NW during its formation phase was different from that of the Compound fertilizer NW. It did not involve any physical assets or major investment. The broker mainly devoted his efforts towards building relationships with key influential government actors by supporting the Science bureau’s organization of an exhibition of local science and technology in the Yichuan County. While the relationships were being built up at both organizational and individual levels, initial product distribution was being tried and a further tie with the Biofertilizer distributor was established. However, according to the data collected through question 10, the broker of the Biofertilizer NW was confronted with the challenges of *“determining a good business opportunity,” “working out a solid business plan and proposal,” “identifying suitable potential partners,” “convincing potential partners to join the cooperative arrangement”* and *“personal relationship and contact to the key*

stakeholders.” The activities were directly related to the architect role. The broker’s strategy was to position an environmental, green image of his biotech fertilizer against the traditional chemical based fertilizer in the relatively stable environment of Yichuan County. With gradual identification of the potential partners and a steady build up of personal relationship and trust with key individuals, the POE broker communicated his strategy and demonstrated the advantages of a joint NW cooperation to the Pomology researcher, a SORI actor, the Science bureau, a governmental actor, and the Biofertilizer distributor - a POE actor. As a result of his efforts, the partners were convinced of the potential benefits of the alliance, and actions were taken to enter into the cooperative operation based on an oral understanding. The cooperative structure for the moment has no particular legal arrangement (except for the product transaction agreement between the POE broker and the Biofertilizer distributor) but it still stands upon the sound foundations of **personal relationship and trust** between the partners. The broker has managed to develop a momentum that allows the partners, to lose no time in capturing market position, while simultaneously continuing to perfect their cooperative arrangement.

4.7.3.1.3 The Agrochemicals and Ammonia INWs

As explained in the previous sections, the State initiated restructuring processes were characterized by central and local industrial administrators who identified and established the strategic business needs for forming the Agrochemicals and Ammonia NWs. The State broker and the SOIE broker then integrated and implemented the strategic decisions made by the superior organizations into their roles.

In the Ammonia NW case, Mr. Zhou, the SOIE broker responded to question 10 that **“determining a good business opportunity,”** and **“working out a solid business plan and proposal, and gaining support from the parent organization”** were the major challenges in connection to the Ammonia NW’s formation (at his level). Data collected through interviewing key managers showed that, in the case of the Ammonia NW, the problem mainly related to the redundancy of activity among the six small fertilizer producers in the already oversupplied market. In addition, the rigid SOE system lacked manager incentives to prevent the individual plants from adjusting themselves through market mechanisms. There were certainly justifications for the decision the way the Ammonia NW was formed from the SOIE brokers’ point of view, such as standardization of their market behavior and avoidance of social unemployment etc. as explained by Mr. Zhou. However, simply integrating the operations of the six firms into one marketing platform without resolving the fundamental issues of redundancy of activity and continuing to practice the same SOE system has created potential internal competition among the members.

Secondly, the **legal and organizational arrangements** linking the actors were designed by the State broker (following the instructions of the central authorities in the Agrochemicals NW), and the SOIE broker in the Ammonia NW. Thirdly, only the State broker and SOIE broker decided on the inclusions of the internal units into the two new configurations within the systems. In addition to these creator roles performed by the brokers, other roles of particular importance to the formation of the two NWs were found as well. Precisely, the MCI and the State broker lobbied the central government to provide strong financial and political supports to the establishment of the South Pesticide Synthesis Research Center within the Agrochemicals NW. With all favorable conditions coupled with unique supports, the

Agrochemicals NW was smoothly formed within a short time. In this sense, MCI and the State broker were **enablers** and **catalyzers**. The SOIE broker, too, played the same roles, in terms of striving for financial and political support from the authority for the creation of the Ammonia NW, though on a smaller scale compared to the Agrochemicals NW.

Compared to the market initiated NWs, the vertical decision-making processes conducted by the State industrial administrators did not involve negotiation, bargaining, or compromise between the various stakeholders. The industrial administrators drove through the entire formation process and appointed the management teams - consisting of leading members from the member organizations.

According to the responses to question 10 of the interview guide from the former management team members of the Agrochemicals NW (presented in section 4.6) the major problems during the formation stage were distrust and conflict of interests between the key partners. Had the State broker resolved the relationship issues at an early stage, it would have prevented these problems from being carried further into the NW building process phase.

The brokers in the two INWs (by acting as **creator**, **enabler** and **catalyzer**) formed the Agrochemicals and Ammonia NWs. However, the State broker spent fewer efforts on team building and the appropriate arrangement of key management personnel at the formation stage - which later lead to non-cooperative behaviors between the NW members during the later operational stage. In the Ammonia NW case, the SOIE broker inadequately addressed the issues of redundant resources and activity structure with the NW members during the formation phase. These potential issues became real problems when triggered by external oversupplied market pressure. The suggestion of this study is that, if not anticipated and resolved by the brokers before or during the formation stage, the potential issues presented in the two INWs could lead to negative consequences in the next phase of NW building process.

4.7.3.2 Developmental Phase

As NWs moved into the development phase, the broker's emphasis shifted from the activities of creating NWs to an increasingly intensified implementation process of the strategies made during the formation phase. The primary roles of the brokers in the NW groups at this phase are as explained in the previous section, **lead operator**.

The analysis of the broker roles in the development phase begins with data collected from question 23 "*As the cooperative arrangement moved into the operational stage, which of the following activities have become your main activities?*" Those informants who played broker roles in the NW groups were asked to select an answer from a list of eight major tasks during the NW development phase (see the Appendix II). The objective of this question was to see specifically what and how each broker experienced in playing their primary roles during this particular stage of NW building process. Furthermore, the broker's behaviors were examined along with the three major areas of the lead operators' roles: 1) **choosing managerial style** with particular regard to **leadership, conflict resolution, and communications**; 2) **managing NW's evolutionary process** and 3) **handling NW politics and information processing** which, according to the literature, demand most of broker's attention during the NW development phase. The corresponding questions to investigate each variable were questions 48 (member), 50 (broker) and 52 (stakeholders) which asked informants to

evaluate the leadership style of the brokers in their management of this particular form of organization through a multi-item, seven points Likert scale. Question 49 (member) and questions 51 and 53 (broker) dealt with broker's conflict management style "*To what extent disagreement over alliance creation issues were resolved,*" and informants were asked to answer the question by selecting a single item measure from: **executive order**, **debate**, **compromise** and **accommodation** (refer to Appendix XIX). Questions 28, 29 (member) and 30, 31 (broker) examined the third element of the lead operator's managerial style, the communication aspects by asking the informants: "*How do partners communicate to each other? Do they communicate through a coordinated system or on an individual bases? How often do partners meet for discussing matters in the cooperative arrangement?*"

Regarding to second area of **managing of NW's evolutionary process**, questions 26 (member) and 28 (broker) asked the respondents "*Do you feel the pace of the process in the cooperative activity were proceeded slower or faster than some other members felt? And moreover, "How important is a comfortable pace for all partners to the successful cooperation?"*" The purpose of the questions were to find out whether the process pace of the, as defined and managed by the lead operator, was appropriate to all participants in the NWs.

The third area of the lead operator's role, according to the literature, is **handling NW politics and information processing**. Questions 50 (member) and 52 (broker) investigated the political activity in the NW groups "*...did coalitions form and change among decision makers during the formation process?*" Question 52 (member) and 54 (broker) examined the brokers' handling of information processing in the NWs. The informants were asked to comment a list of eight items including: "*... to what extent did partners feel that they had the opportunity to express their ideas about the relationship? Did they feel their views were included in the decision process? Did you feel that other's ideas were imposed upon you? Were written rules and procedure followed? Did individuals interact with each other on informal bases? Did committees, such as ad hoc groups, form to deal with strategic issues? Did one or two people dominate the handling of the development process? Was there a free and open exchange of ideas?*" (Refer to Appendix XVIII).

4.7.3.2.1 The Hybrid Seeds and Honeybee DNWs

The two SORI brokers switched their creator roles in the formation phase to the lead operator roles in the development phase of the NW building process. Professor Zhao, the Seeds broker, responded to question 23 stating that the most important tasks for him to focus on (this at the time when the Hybrid seeds NW entered into the development phase) were, firstly, "**coordinating relationships among the partners and other stakeholders,**" and secondly, exercising "**strategic leadership of the cooperative activity.**" As a reminder, section 4.6, presented a stepwise explanation of the business operation between the actors in the two DNWs -indicating the complexity of carrying-out relationship coordination, and highly differentiated processes of technical operations among members who were geographically distant from each other). A congruent operation among the members is a prerequisite to the success of the NW's objective - the role of coordination being especially imperative. Furthermore, the coordinating role among partners and stakeholders included the development of personal relationships and trust which, according to the informants, were more important during the development phase than during the formation phase

(according to the responses to questions 32 (member) and 34 (broker) by most of the informants - presented in section 4.7.2.2).

“Strategic leadership of the cooperative activity” was considered as another important role by professor Zhao during the development phase. Mr. Wang, the Bee broker, shared the same view - since the activities executed in the Honeybee NW were identical in many ways to those of the Hybrid seeds NW - in terms of business process and broker’s central functions among the NW members. Decisions of strategic importance such as speed and geographical expansion of business development, new product development, quality control standards, new partner membership acceptance, cooperation with nonmember parties etc. are made and executed under the leadership of the two brokers in the respective NWs – as was reflected in question 29. According to the survey results, both brokers regarded *“developing new strategy”* as an important task as well. Nonetheless, since the two NWs are still at a relatively early stage of operation, implementing the strategies made during the formation phase remain as the primary focus for their current activities.

Concerning the lead operator’s managerial style (with regard to leadership, conflict, resolution, and communications) questions 48 (member), 50 (broker), and 52 (stakeholders) asked informants to evaluate the brokers’ leadership style by assessing through a multi-item, seven point Likert scale. The survey results showed that, from among the nine measures, both brokers had high scores on leadership style, as Table 50 shows at the end of section 4.7.3.2.3

The findings demonstrated that both Professor Zhao and Mr. Wang, in their respective positions, used a style characterized by **people orientation** which emphasized sound cooperative **relationships** between the partners at both organizational and individual levels (as presented in the previous sections 4.6.3.1.2 and 4.7.2.2).

Concerning conflict management (corresponding to the survey results from questions 49 (member), 51 (broker) and 53 (stakeholder)) all respondents from the two DNWs said that disagreements were resolved through consultation (an item added by the respondents), compromise, and accommodation.

As far as communication is concerned, data collected from questions 28 and 29 (member), and 30 and 31 (broker) reflected that both brokers communicated with their NW members through the media of formal and informal meetings, telephone conversations, and frequent personal contacts. The brokers also organized technical information and experience exchange activities between the NW partners - such as distributing information materials, providing training courses and practicing field demonstrations.

Regarding **NW evolutionary process managing**, data collected from questions 26 (member) and 28 (broker) showed that in the Honeybee NW, Mr. Wang believed that: *“at the present stage, the pace is well coordinated, all parties know what should be done and when it should be done.”* He further confirms that an appropriate pace of development for his NW members is an important matter. In the case of the Hybrid seeds NW, however, members have different views towards the pace of development of their operation - as Mr. Xiang, the Seeds reproducer, expressed: *“we do not agree with developing too quickly. In this particular aspect, the pace probably should not be the same for all.”* Contrary to the Seeds reproducer’s opinion, Mr. Jiao, the Seeds distributor argued: *“We are of the opinion that the pace is too slow, and that the demand for the seeds is very high and the supply is short. From the market point of view, we should seize this business opportunity...”* while Mr. Liang, the Parent seeds producer, felt that the pace was satisfactory for them. For the lead operator to proceed at a pace that is comfortable to all three partners is a challenging task. Professor Zhao

took a balanced view: “...*the pace is acceptable for everybody for the time being. Some partners wished to speed up the process for an overall development.*” It was observed that the Seeds broker has a clear tendency to move faster. However, as a lead operator, must also manage the development process by taking, as a whole both, short and long term concerns of the NW into consideration.

Literature suggests that the third area of attention to the brokers is **management of politics and information processing**. According to the data collected from questions 50 (member), 52 and 54 (broker) the political activities in both DNWs were not issues - so far in the sense that no coalitions were formed. This is consistent with the responses of all informants interviewed. However, the brokers fully recognized the sensible nature of the “dual allegiance” each partner has. Therefore, attention was paid to take into account individual members’ interests as well as the collective NW interests. Data collected from questions 57 and 58 (member), and 59 and 60 (broker) showed that a high degree of informant satisfaction may be the best evidence of such balanced achievements, of the individual members as well as the NW as a whole, in the two DNWs. In the area of information processing, data collected through questions 52 (member) and 54 and 56 indicate that all partners felt that: “*they had the opportunity to express their ideas about the relationship, that their views were included in the decision process, that there were no other’s ideas imposed upon them and written rules and procedure were followed.*” Most of the informants said that “*individuals interacted with each other on informal bases*” and finally, all informants believed that “*there was a free and open exchange of ideas*” in the DNW group. The survey results indicated that the information provided to the NW members by the two lead operators was appropriate, adequate and suitable for the information-processing capacity of each NW member.

As a final point, since the two brokers were responsible for the key technological resources, apart from their broker roles, they also played respective *functional roles* as well - such as supplying products and services, and providing technical instruction and training to the other NW members in carrying out their operational tasks.

4.7.3.2.2 The Compound Fertilizer and Biofertilizer SNWs

As explained in the case description (see Appendix I, 3-6), the Compound fertilizer NW had a special arrangement for the NW’s operational management during the initial stage of development phase. Under the arrangement the SODE broker shifted from his previous role as creator to a lead operator role in the new phase. During the interview Mr. Chen, the broker, responded to question 23 by saying that the most important tasks for him at the NW’s development stage were first, “**coordinating relationships among the partners and other stakeholders.**” Led by the broker, the Compound fertilizer NW is currently in the process of implementing the strategies made during the formation stage. To ensure market timing, various cooperative activities and relationships among the five partners had to be effectively coordinated. As presented in section 4.6, the SODE broker was more suited to play this role than anyone else in the Compound fertilizer NW. The second task considered important by Mr. Chen was “**strategic leadership of the cooperative organization**” referring not only to the SODE broker’s Chairmanship in the Compound fertilizer NW, but also to its frontal line distribution position. As to the third task, “**operational coaching and facilitating the cooperative organization,**” were considered important mainly because of the transitional arrangement made between the broker and the Fertilizer producer. In this case, the SODE broker played a **coaching** role as well. “New

business development” is the ongoing task of the lead operator in the Compound fertilizer NW because of the established strategy of developing stable product supply sources for its distribution networks.

In another SNW, the POE broker played the lead operator role. The answer to question 23 from Mr. Zhang, business manager of the POE broker, is similar to that of the lead operator in the Compound fertilizer NW: “*coordinating relationships among the partners and other stakeholders*” was the most important task for him as the cooperative operation moved into the development stage. This task is a particular challenge for a small POE actor, as he had to coordinate the relationships among one government actor, one SORI actor and another POE actor- all operating in a process consisting of production, promotion, distribution and after-and all of this while in a remote countryside market. The key success factor in managing this cooperation, as said by Mr. Zhang, was due to the POE broker’s particular efforts in building relationships with the different partners. The encouragement of developing relationships between both firms and individuals helped to establish trust between the NW partners. The important role of personal relationships and trust in the Biofertilizer NW was presented earlier in section 4.7.2.2.

The lead operator’s **managerial style** (with regard to *leadership, conflict resolution, and communications*) is shown by data collected through question 50, presents in Table 50 at the end of section 4.7.3.2.3. The results (based on a multi-item, seven point Likert scales) showed that among the nine leadership measures, the SODE broker and the POE broker received high scores in the categories of **sharing**, **participative** and **supportive**. The results reflected a leadership style characterized on people orientation and an emphasis on cooperation between the partners at both organizational and individual levels, as presented in the previous sections 4.6.3.1.2 and 4.7.2.2, and **resolute** showed that both brokers were decisive and action oriented leaders. Besides this, Mr. Chen also had high scores in **negotiation**, which indicated his willingness to find the middle ground or compromise with other partners on matters of differences.

With respect to **conflict management**, the survey results from questions 49 (member), 51 (broker), and 53 (stakeholder) show that all respondents interviewed from the two SNWs expressed that disagreements were resolved through **accommodation**, **compromise**, and **consultation** (an added item by the respondents). This result coincides with the results of the DNWs as presented earlier.

The two brokers’ behavior in the *communication aspects* were investigated by the data collected from questions 28 and 29 (member), and 30 and 31 (broker) which reflected that both the SODE broker and the POE broker communicated with their NW members through the media of *frequent formal and informal meetings, telephone and personal contacts*. In addition, partners in the Compound fertilizer NW often met at professional occasions outside the NW. In the Biofertilizer NW, Mr. Zhang paid frequent visits to the partners and exchanged information with them on a regular basis. Both Mr Liu from the Science bureau and Mr. Wu from the Biofertilizer distributor appreciated the brokers’ efforts in this particular regard.

Regarding the lead operator’s role of **managing the NW evolutionary process**, data collected from questions 26 (member) and 28 (broker) showed that, in the Biofertilizer NW, “*Some partners felt that the pace was slow and wished to speed up, but our business sometimes should not be too fast.*” Mr. Hao explained: “*we explained to them [the importance] of a congruent development pace. It (a correct pace) is important to the success of cooperation.*” In the Compound fertilizer NW, according to Mr. Chen: “*the pace is fine for all partners and we have no problem for*

the time being, however, the pace is still an important matter.” All the NW participants interviewed shared his view, except for Professor Zhou, the Agro-researcher. He thought that the pace could be faster than it was, but still acknowledged that the delay of the business licenses was primarily due to the obstacle encountered during the approval procedure. In general, both lead operators have reasonably managed the processes of development for their respective NWs up to the present time.

The third area analysis of the lead operator is the **management of politics and information processing**. Data collected from questions 50 (member), 52 and 54 (broker) indicated that political activities in both SNWs have not been issues so far, and there is a consensus about this from among the members according to the responses of all informants interviewed. Like the DNWs, the data collected from questions 57 and 58 (member), 59 and 60 (broker) demonstrated an overall informant satisfaction and the existence of healthy political atmospheres in the two NWs as they stand now. In the area of information processing, data collected through questions 52 (member), 54, and 56 show that all partners felt that: *“they had the opportunity to express their ideas about the relationship, that their views were included in the decision process, that there were no other’s ideas imposed upon them and written rules, and procedure were followed.* Most of the informants said that *“individuals interacted with each other on informal bases”* and finally, all informants believed that, *“there was a free and open exchange of ideas in the NWs.”* The survey results indicated that all informants interviewed felt that the lead operators provided them adequate information. It is important to point out that the two SNWs in the NW groups were only at their early stage operation in the development phase; the assessment on the effectiveness of the NW actor’s (including the brokers’) roles and behaviors were, in fact focused, more on the successful formational phase and less on the development phase. Lastly, similar as in the DNWs, the two SNW lead operators were also responsible for the key resources and core product distribution competence in the Compound fertilizer NW, and production process in the Biofertilizer NW. For that reason, apart from their broker roles, the brokers played respectively *functional roles* as well in the value chain process of the two SNWs.

4.7.3.2.3 The Agrochemicals and Ammonia INWs

Unlike the brokers in the NW groups the creators of the two INWs (upon completing the formation of the two NWs) delegated responsibilities to the appointed managers to continue the NW building processes. In this context, the broker roles in the INW group were performed by both strategic actors - the State broker and the SOIE broker, and operational actors - the president of the Agrochemicals NW and the Marketing center GM of the Ammonia NW.

Data collected from question 23 demonstrated that Mr. Lang, the former president of the Agrochemicals NW who played the lead operator role, acknowledged that the most challenging job he had during the development phase was **“coordinating relationships among the partners and other stakeholders.”** Although this task coincided as a top priority by the brokers in all other NWs of this research, it had a very different meaning in the case of the Agrochemicals NW. According to data collected from all the Agrochemicals NW related aspects evidenced that, apart from other external environmental factors, the collapse of the group was largely due to the uncooperative behaviors of the management team members. As presented in the case descriptions and sections 4.7.2.1.3 and 4.7.2.2.3 from the Agrochemicals NW

management team members, serious relationship problems existed which harmed the group's execution of its mission. The president of the group had a problem in dealing with both internal and external relations. On one hand, according to him, this occurred because **the SOE system refrained him from exercising executive power to discipline misbehavior** which, logically, made it difficult to motivate good behavior. However, on the other hand, he failed in managing the complex relationship among the partners – meaning that he **failed to play a lead operator role** as required by the broker's job description. To find out more causal factors to the Agrochemicals NW's failure during this development phase, further variables attributed to the broker's managerial style (in the areas of leadership, conflict resolution, and communications) will be examined later in this section.

In the Ammonia NW case the General Manager, Mr. Lui, responded to question 23 that his major concern during the development phase was also *“coordinating relationships among the partners and other stakeholders.”* Additionally, he considered that other points of the question such as *“operational coaching and facilitating the cooperative arrangement, new business development”* and *“developing new strategies”* for the Ammonia NW members were also important roles in his operation. Mr. Liu devoted considerable time to the lead operator role in the above areas with particular efforts made to develop personal relationship and trust with the NW members, as he responded to questions 32 and 33 (members), and 34 and 35 (broker) in section 4.7.2.2. Data collected through interviews demonstrated that the GM led his team in working hard to deal with both internal and external relationships. Internally, the Marketing center initiated the creation of a central market research and information system which strengthened the raw materials purchasing position, provided training support to the members, and organized experience exchanging activities for them. Externally, he tried to create business opportunities through making deals with distributors, obtaining financing for the members, developing new markets, and exploring cooperation with the upper stream raw material suppliers. Other important broker roles included lobbying the industrial department of the Municipal Government for favorable policy and treatment for its members. Likewise, the GM also made efforts in new product and business development for the members. Nevertheless, despite these efforts, the problematic situation continues to exist in the Ammonia NW, in terms of rule breaking and internal competition among the members - mainly because of the problem of oversupply of similar products in a limited local market.

Pertaining to the lead operator's managerial style (with regard to leadership, conflict resolution, and communications) data collected through the calculation results of the seven points Likert scale of question 50 showed that overall scores on the multi-items, regardless positive or negative outcomes, are at below average levels in the Agrochemicals NW when compared to the other five NWs. This can be explained, to some extent, by **an overall passive role-play by the lead operator**. Among the nine leadership measures for the lead operator (see Table 50), the members of the Agrochemicals NW gave their lead operator high negative marks **directive** (4) and **autocratic** (2.5). These results showed that a leadership style of **task orientation** and an **autocratic approach** was used by the lead operator.

The picture of the Ammonia NW case is a rather mixed one. On one hand the corporate broker received a high score in a leadership style of **commanding** (5.7), **directive** (4.2) **resolute** (5) and **autocratic** (5.5) demonstrating the SOIE broker's **hierarchical operational process** as typified by the influence of traditional SOE

systems. On the other hand, scores on **negotiation** (6.2), **sharing** (4), **participative** (4.2) and **supportive** (4.7) showed a style characterized by emphasis on **cooperation** between the partners and **people orientation**, endeavored by the lead operator Mr. Liu and his Marketing center at the operational level.

Concerning conflict management, the survey results from questions 49 (member), 51 (broker), and 53 (stakeholder) showed that nearly all respondents interviewed from the two INWs said that disagreements were resolved through executive orders by the superiors. This **impersonal approach** to conflict resolution reflected the command initiated restructuring process of the two INWs, as presented in the case descriptions and previous sections.

The communication aspect behaviors of the two brokers in the were investigated by the data collected from questions 28, 29 (member) and 30, (broker) and 31 (stakeholder) which reflected that, in the Agrochemicals NW, communication was conducted through a media of fixed meetings as well as internal computerized information system. While in the Ammonia NW, in addition to using same kind of communication system as the Agrochemicals NW group, the GM maintained direct **personal contacts** with the NW members and some of the partners were in contact with each other outside of the NW.

Turning to the subject of the second area emphasized by the literature, **managing the NW evolutionary process**, data collected from questions 26 (member) and 28 (broker) showed that, in the Agrochemicals NW, the formation process was conducted very rapidly, since, because of the top-down administrative order, there was nothing to be discussed among the potential members. However, during the development phase, the standard operational style of the SOE system was applied in every part of the process, therefore leading to slow decision-making. This was a complaint of Mr. Lu, the former deputy director of the Agrochemicals NW. In the Ammonia NW case, the SOIE broker believed that the pace worked well for everyone because there were no voices on this particular aspect at the time of the interview was conducted. According to the manager of the Qingpu fertilizer plant, the silence in this aspect is a consequence of the lack of concrete business operations within the Ammonia NW; therefore, participants did not have a sense of individual responsibility. On the other hand, he did believe that an appropriate development pace was an important factor. The general observation obtained from interviewing the informants revealed that members were less enthusiastic on this subject of the NW operation.

Regarding the tasks of **management of politics** and **information processing** (according to data collected from questions 50[member] 52 and 54 [broker]) political activities existed in both INWs. As Mr. Lang said in section 4.6, *"It was not easy to put together several partners who have relationship histories (positive and negative), and politics was a big problem."* The same comment was also heard from the former Director of MCI (presently the Secretary general of CNPA), *"there was too much politics among the partners in the Agrochemicals NW."* As a result of various actors' uncooperative behaviors, formations of coalitions were found among the partners during both formational and developmental phases - as testified to by Mr. Gao and Mr. Lu, the former deputy directors of the Agrochemicals NW. Furthermore, the president was blamed for not taking action in the tackling these issues. This complexity of the past relationship patterns among the partners was one of the major factors that negatively affected the Agrochemicals NW's operation during the development phase, leading to its eventual failure.

The politics in the Ammonia NW was also an issue, according to the informants interviewed, although not as serious as in the Agrochemicals NW. Mr. Liu responded to questions 50 (member) 52 and 54 (broker): “... *Yes, small coalitions among the members were often the case; we had to coordinate [efforts] to help reach agreement among the partners.*”

It was observed from interviewing the informants, from both INWs, that the relationship pattern in the Ammonia NW was problematic as well - though it differed in nature from that of the Agrochemicals NW since the internal competitive activities between the six fertilizer plants resulted mainly from the oversupplied market situation. While in the Agrochemicals case, the relationships were poisoned by unhealthy politics between the key individuals.

In the area of information processing, data collected through questions 52 (member), 54 (member), and 56 (stakeholder) showed that most of the partners felt that “*they had the opportunity to express their ideas about the relationship and their views were included in the decision process.*” On the other hand, despite the belief that “*there was a free and open exchange of ideas,*” nearly all the members of the Agrochemicals NW said, “**others’ ideas were imposed upon them,**” (Mr. Lang explained this meant the superior’s decisions) and “**written rules and procedures were not followed.**” The later applied to both NWs. Most of the informants said: “*individuals interacted with each other on informal bases.*” Plus, survey results indicated that all informants interviewed in the Agrochemicals NW felt that the lead operator provided limited them only information.

The survey findings revealed that the lead operators in the two INWs experienced both similar and dissimilar challenges in their NW building processes. The two INWs had many aspects in common. Firstly, they were both SOEs in transition from the traditional central planning system to a market system. Second, both of them operated in a mature business environment. Third, both NWs were initiated by command, instead of the market, and the relationships in the respective NWs were predetermined by actors who were unwilling to cooperate from the outset. Finally, both operational brokers felt that the SOE systems were too rigid to adequately empower them in executing their tasks.

Among many, the most distinct aspect of the two INWs was that the Agrochemicals NW had an overall good condition thanks to the strong support that it got from the central and provincial authorities. Comparatively, the Ammonia NW was in a much less favorable condition due to a serious oversupply market problem, poor member assets, and low priority given to the management authority in comparison with the Agrochemicals NW.

However, despite these external factors, the lead operator of the Agrochemicals NW managed neither the internal relationships (by creating a cooperative spirit among the partners) nor the external relationships (by gaining further support and confidence from the central and provincial authorities for the continued development of the NW) (see Appendix I, 6-6). The failure of the Agrochemicals NW was due, in part, to the external environmental pressures and SOE system problems. Nevertheless, the main cause was *uncooperative behaviors* between the key executives. The actors who are mostly responsible for this failure are those who looked after both internal and

external relationships of the NW, - the State broker and the President of the Agrochemicals NW.

The lead operator in the Ammonia NW operated in a tougher environment than the Agrochemicals NW's, but tried hard to perform his job in a manner oriented toward building relationships and trust - communicating through media such as informal meetings and social events. Data collected shows that the lead operator proactively took many new initiatives to improve the deteriorated situation of the participants in the Ammonia NW but generated less results - due to the external oversupply market problems and internal burden of years of accumulated SOE problems. With further foreseeable reformation, as indicated by Mr. Zhou and Mr. Liu, if the aforementioned internal and external constraints could be effectively handled, the broker could play his roles more effectively and achieve better results for the NW development.

To conclude this section, Table 50 summarizes the results of questions 48 (member), 50 (broker), and 52 (stakeholders) - concerning the leadership style of the brokers in their management of NW form organization.

Table 50: Leadership Styles of the NW Brokers

	DNWs		SNWs		INWs	
	The Hybrid seeds NW	The Honeybee NW	The Compound fertilizer NW	The Biofertilizer NW	The Ammonia NW	The Agrochemicals NW
A Negotiating	6.2	5	6.2	3	5	3
B Sharing	4.2	5.7	5	4.7	4	3.2
C Participative	5	6.2	5.2	6	4.2	3.7
D Commanding	4.2	4.5	4.6	4	5.7	3
E Supportive	4.2	4.5	5.6	7	4.7	3
F Directive	3	3.5	2.8	3	4.2	4
G Resolute	4.5	6	6	5.7	5	3.5
H Autocratic	1.25	1.25	1.2	1	5.5	2.5
I Authoritative	6.7	6.7	3.6	3.2	2.5	2.5

All scores are averages based on a scale of 1= very low through 7 = very high. Sample size=26

Having presented and analyzed the data regarding the broker's roles and behaviors in the developmental phase, the next section interprets and explains some tendencies reflected from the data collection process in relation to the future stage of the NW building process - the broker roles in the Transtage phase.

4.7.3.3 Transtage Phase

This section focuses on identifying and analyzing the broker's roles in the continuation of the NW building process. All the NWs except for the Agrochemicals NW (since it was dissolved) investigated in this research, actually still operated at their developmental phase. The task here is to anticipate the broker roles in a new phase which was practically nonexistent. The approach used in this section was to analyze some tendencies of trajectory development of the NW groups as reflected by the objectives, strategies, and evolutionary process of relationship patterns between the NW participants. The evidences collected from questions 2 (member/broker) and 19 (member), 20 (broker), 22 and 23 (member), and 24 and 25 (broker) and 25 (member) and 27 (broker) were used for achieving this objective.

Section 4.2 presented that in the process of continued economic reform, external factors such as technological development, market changes and China's recent accession to the WTO have all intensified existing competition in the agribusiness sector. In such an external environment, though some individual actors in the NW groups first cooperate in a NW structure, they may finally merge into a new company. On the other hand, since deregulation is the dominant process in enterprise reform, whereby the former SOEs, mainly the SOIEs and SODEs, may in many cases be transferred into a holding structure and they latter may break up into individual firms with specific ownerships. In this case, a NW structure is a transition state evolving from life as a big SOE to smaller, individual firms (e.g. the Ammonia NW). Other possible measures of SOEs reform include restructuring through assets management, mergers, and acquisitions processes. In the NW groups of this dissertation, tendencies of different types of trajectories were visible which may potentially lead to different relationship settings between the present and future NW partners as these NWs continue to develop.

4.7.3.3.1 The Hybrid Seeds and Honeybee DNWs

In section 4.4 the Seeds broker and the Bee broker all responded to question 2 by that their motives of forming the respective NWs were “*responding to a growth opportunity*,” and both DNWs enjoyed good business growth during the development phase. Data collected from the interviews with each key partner, as well as the published literature of the Seeds broker and the Bee broker, indicated the future directions of the two DNWs. As presented in the case description, the Seeds broker had decided upon his mission to become a leading international research and marketing institution in the hybrid wheat seeds business. To achieve this goal, the Seeds broker will continue to implement a strategy of keeping the core competence of high technology within the NW and go on with the present cooperative arrangement. At the same time, he will expand to other targeted regions in China and abroad; for example, the North China wheat-growing regions, as Mr. Liang the Parent seeds producer, projected and North American countries, as Professor Zhao envisioned. However, in addition to other resources, one could imagine that an expansion of such scale will no doubt require strong strategic and operational management capabilities, which is not the strength of either the Seeds broker or of the other partners in the Hybrid seeds NW. To develop such management skills from within the Seeds broker's organization would not be an efficient solution, taking into consideration the complexity of the seeds business -especially in the international market. On the other hand, according to data collected through question 27 (broker), the young scientist, Professor Zhao had already spent 70% of his time on the administrative and commercial matters for the NW operation. Further involvement in business operations would hardly leave him and the team any time to carry out research activities which is the precise core competence of the Seeds broker.

The same indication was observed during the interview with Mr. Xiang, the Seeds reproducer. When responding to questions 22 and 23 (member), and 24 and 25 (broker) about the NW management, he expressed that at the present stage: “... *The Seeds broker is responsible for the strategic matters and the local partners take care of operational work. We are a government department, and the Seeds broker is a research institution. And as for future management, when the operation develops to a certain stage, we should all return to the positions where we came from. Large-scale business operation should be managed by the business enterprise, because, as*

governmental department and research institutions, we have our limitations during certain stages of development...” Mr. Xiang had a clear opinion that with an expanded business, both government and the SORI actors should keep playing supporter’s roles and functional roles, instead of being strategic and leading operational roles, letting professional managers manage the expanded business operation.

Therefore, to return to the background of the evolutionary process of the Seeds broker’s decision to form the present NW with other partners in the hybrid seeds operation, it would be logical if Professor Zhao uses the same NW approach, involving professional managers who have large-scale strategic and operational experience in the international seeds business market, to manage the expansion. Alternatively, the Seeds broker could also cooperate with multinational companies which have existing marketing NWs as well as experience in doing business in the targeted market. Following this direction, a more formalized relationship - than the present loosely coupled relationships with new institutional or individual actors - seems to be a possible pattern. Such a tendency was, in fact, already reflected by Mr. Liang’s responses to question 19 (member) and 20 (broker) in section 4.6.3.2.1. He had a clear intention in favoring an integrated company structure, with centralized resources, to conduct larger scale business operations in the North China wheat-growing region.

The Honeybee NW’s business was also in a process of expanding from the existing local NW operation to a nationwide network that would cover substantial areas of China. For the Bee broker, such scale expansion of many new relationships (like in the Hybrid seeds NW’ scenario) along with other resources, requires strong strategic and operational management capabilities. Which is, again, not the strength of the Bee broker and or any of the partners in the present NW. On the other hand, concerns similar to the Seeds broker’s will prevent the Bee broker from attempting to do everything on his own because of the similar resource constraints in research tasks. Therefore, taking into consideration the scale operation and complexity of coordinating work of many new relationships, a strategy similar to that of the Hybrid seeds NW’s would most likely be the answer to the Honeybee NW for its further development in the transtage phase. Accordingly, a desire to create a more formalized relationship along the expansion process was also expressed by Mr. Xu, the Township administrator. He envisioned a future formal relationship to be arranged between the partners when the business became sizable, as can be seen in his response to question 19: *“For the time being, a loosely linked relationship is better. As for the future, when the business grows bigger and more complex, a closer relationship may be better to enforce partners in performing their own duties.”*

Since both DNWs had possibilities of moving toward a relatively formalized expansion program, any new tasks call for actions on the part of the brokers. Based on the above analysis of the objectives and strategies of the two SORI brokers, as well as the intentions of the NW participants, at the beginning of the transtage phase the brokers may continue to play their **lead operators roles** - dealing with the NWs’ internal and external relations, as presented in section 4.7.3.2. At the same time, the brokers might play the **architect’s roles** again, by doing such things as determining new strategic moves, demonstrating advantages of the decisions to the existing members, identifying new participants, and designing new legal and organizational arrangements by which participants will be linked- along with following up the NWs’ **reformation process** implementation.

Upon completion of the reformation process, the brokers may act as **coach** and **facilitator** for the new managers familiarizing them with the various relationships work relationships, as well as helping them coordinate relationships among the partners. These tasks will continue to remain important to the brokers, because of their close linkage and personal relationship with all partners. On top of all the above roles, the two SORI brokers can also continue contributing to the NW's growth with their **functional roles** from each of their respective technological domains. Such functional roles may demonstrate more efficiency in a new role distribution structure. Most likely, the two brokers might hold major shares in the new setups - for which they will be functioning as an important part of a board of directors that supervises the overall strategic matters of the new entity.

4.7.3.3.2 The Compound Fertilizer and Biofertilizer SNWs

As presented in section 4.4, the two brokers from the SNWs also responded to question 2 by saying that their motives for forming the respective NWs were **“responding to a growth opportunity”** and both were encouraged by initial positive results achieved through collective efforts of the alliance members.

Given the fact that both SNWs have just entered into early stages of the development phase, the transtage phase begins by the time new strategic moves are initiated affecting the structure of then current cooperative arrangement. Under such circumstances the broker's roles will have to adapt accordingly to the needs of new situation. The assumption of the transtage phase and the broker's roles are, therefore, based on the development of the relationship pattern between the NW participants as indicated by the survey results of question 19 (member) and 20 (broker) of the interview guide.

The transtage phase of the two SNWs, may be characterized as a continual evolutionary process of further stabilizing relationship and business operations from the basis of the cooperative arrangements between partners during the development phase. Section 4.4 talked about how the SODE broker's objective was to stabilize the product supply for its distribution pipelines, which then led to the creation of the Compound fertilizer NW. Consequently the priority of the NW, for a considerable period of time, will be to concentrate on the implementation of strategies that ensure that all partners will function congruently and efficiently toward a common direction. When the time approaches for the Fertilizer producer to get reasonably up-to-date with various relationships and familiarized with the necessary aspects of the Compound fertilizer NW's business operation, all production related responsibilities are to be shifted to the Fertilizer producer. By doing so, the SODE broker will continue to function as a lead operator, emphasizing a strategic role of coordinating relationships among the stakeholders and dealing with external relations. Complimenting this, the SODE broker would also continue to play an important role in product distribution for the NW.

Similarly, though in a comparatively smaller scale, the POE broker in the Biofertilizer NW had the objective of harnessing increased business opportunity in the Yichuan market by using a strategy that would position himself as a supporter of environmental friendly products, providing green solutions to the farmers. With the initial operation satisfied, continuing to implement this strategy as well as playing a lead operator and a functional role in the NW remains a priority activity for the POE broker.

In predicting the broker roles in the transtage phase, from the relationship perspective, there are some potential change indicators which concern legal and organizational arrangements between the partners in both SNWs. As presented in section 4.6.3.2.3, the SODE broker had arranged cooperative relationships with a tight and loose coupling system. From their responses to questions 19 (member) and 20 (broker), the SORI partners who were loosely linked with the NW had expressed their preference to a loosely arranged relationship at the initial stage of the NW operation. However, they wished to eventually develop such relations into a comparatively tight arrangement between the NW participants later on. On the other hand (with the new open policy) the SORIs could participate as equity shareholders in the economic entity through institutionally owned enterprises - as with the DNW brokers. In the event the organization desires to become stronger and more economically viable, the SODE broker may consider re-adjusting the cooperative arrangement with the participants. This same tendency was found in the Biofertilizer NW as well. The local partners, (namely, the Science bureau and the Biofertilizer distributor) had expressed wishes of a tighter relationship between the partners - especially the Biofertilizer distributor. This was found according to the data collected through questions 19 (member) and 20 (broker). The POE broker also wished to stabilize the cooperative relationship with the local NW partners, since they had proved their value adding roles during the initial joint operation. On the whole, the brokers in both SNWs during the transtage phase will continue to play lead **operator roles**, **functional roles** and, to some extent, **architect roles** in terms of rearranging cooperative relationships between the present and potential future partners.

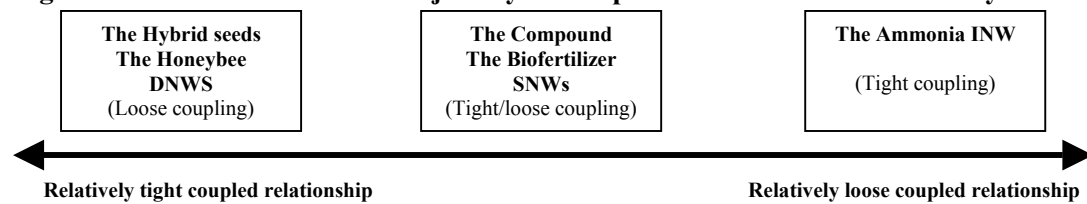
4.7.3.3.3 The Agrochemicals and Ammonia INWs

The Agrochemicals NW, as presented in the case description (see Appendix I, 6-6), was dissolved in 1995, two years after it entered into the development phase; consequently, it is excluded from the analysis the transtage phase. The focus of this section will be on the Ammonia NW.

The Ammonia NW SOEs' transtage phase is characterized by a continuing reforming process. As presented in section 4.4, one of the objectives of the Ammonia NW's formation was to create a relatively unified supply position in the region, stopping the disorderly competition among the six plants. Externally, the Marketing center played a role of coordinating relationships between the members and distributors for better supply and demand ties. However, as presented in the preceding sections, despite the efforts made by the lead operator, the problematic situation continued to exist in the Ammonia NW during the development phase because of frequent rule breaking and internal competition between its members. As introduced in the case description, to reduce the production volume of synthetic fertilizer to an appropriate level, the SOIE broker planned to further close down three plants and converts them into different chemical manufacturing businesses. The other tendency of the Ammonia NW in the up and coming transtage phase was indicated by Mr. Zhou the SOIE broker and Mr. Liu from the Market center. They saw that a further reform of the shareholding system was in the process of preparation. Although detailed information of the new reform was unavailable due to confidentiality reasons, data collected from the informants showed that complementary resources, flexible relationships between the subsystems, and empowerment to the operational units, were the desired directions to pursue. A most common structure is that the SOIE broker acts as a holding company, like many restructured SOE conglomerates. The six fertilizer plants, together with

other units operate under the holding company, but with relatively more autonomy. In any case, as presented in the case description (see Appendix I 5-6), the additional closures of plants planned by the SOIE broker might create a new situation. Another possibility is that, in the future, ownership of the member plants might be restructured by bringing in new and different participants with complementary resources. Whatever the new arrangement might be, **a transition process from a tightly coupled vertical structure to a relatively loosely coupled structure** requires that the SOIE broker replay the role of creator- namely, performing the architect's task in redesigning legal and organizational structure and acting as enabler or facilitator to the reorganization. Figure 49 illustrates the possible tendencies of the trajectory development in relation to the coupling systems in the different NW evolutionary process during the transtage phase.

Figure 49: The Tendencies of Trajectory Development in the NW Evolutionary Process



The assumption illustrated by Figure 49 is that the relationship patterns of the different NWs in this study may have possibilities of moving in directions, different from the present state, during the transtage phase. Explicitly, the findings presented in the preceding sections 4.7.3.3.1, 4.7.3.3.2 and this section showed tendencies that the current loose coupling systems in the DNWs have the possibility to be developed into relatively tighter coupling systems between the *core* collaborators. Contrarily, as is the case of the Ammonia NW, clear tendencies were shown that the tight coupling systems need to be reformed into loosely coupled systems in order for the INW to survive.

As to the Compound fertilizer and Biofertilizer NWs, the trajectory tendencies of both directions were observed. The partners in each SNW expressed mixed preferences on the coupling systems in relation to future cooperative arrangements. In view of their relatively early development stages, the two SNWs are likely to focus their efforts on stabilizing their respective business operations for a considerable period of time before entering into the transtage phase.

The trajectory tendencies of relationships between the NW partners in the DNWs and SNWs may lead to some limited changes. Such development does not necessarily imply that the NWs become formally integrated organizations, seeing as how the majority of the NW participants interviewed showed clear appreciation/ preference to loose coupling systems. Furthermore, each NW involves Government administrators who are not eligible to be integrated into economic entities. In addition, the SORI actors also have to maintain their research domain as their main activities. To sum-up, data collected from the investigation shows that, apart from the NWs' further development, the characteristics of the **interdependent** relationship patterns between the NW participants of this study tend to remain unchanged during the transtage phase.

4.7.4 NW Participants' Preference on Brokers

Having analyzed the broker's roles and behaviors during different phases of the NW building process, this section specially presents and analyzes **the preferences of the**

NW participants on the types of brokers and broker roles. The objective of this section was to obtain direct input from the participants in the NW groups on the subject of the effectiveness of brokers' roles and behaviors - this being linked to the research questions which concern broker performance. For the this purpose, questions 46 (member) and 48 (broker) asked informants "*what is an effective organizer/ coordinator/ cooperative manager's role in your opinion and why?*" Questions 47 (member) and 49 (broker) also asked "... *what qualification should one have to successfully manage this type of organization or cooperate arrangement?*"

To understand the NW participants' concern about the broker's profile in relation to the successful NW building process, questions 54 (member), 56 (broker), and 58 (stakeholder) asked informants to comment on the importance of three broker related factors by selecting responses from a list of eleven factors (see Appendix II). (f) **A powerful cooperative manager** (e.g. big companies in the field, both having capital and technology); (g) **a knowledge based cooperative manager** (a professional firm in the field specializing in strategy design and lead implementation, having links to relevant financial and technical institutions) and (h) **a consistent management** (one cooperative manager for strategic design and implementation).

Finally, question 49 and 50 asked all informants (except for the brokers): "*What would you think if the organizer/cooperative manager's role would be assumed by a third party actor, rather than assumed by the one currently in this arrangement?*" Moreover, "*What kind of third party actor, in your mind, is more suitable to perform the alliance organizer/ manager's role? Why?*" The purpose of this last question was intended to investigate how the NW participants and stakeholders, who have actually experienced the participation of the NW building process of this study, perceive letting alternative actors, instead of the traditional **lead firms**, play the broker roles as - seen from many literatures as well as the cases in the NW groups. For the same purpose, findings obtained from the previous sections are restated when appropriate.

4.7.4.1 The Hybrid Seeds and Honeybee DNWs

The actors of the two DNWs have common views on questions 46/47 (member) and 48/49 (broker) - stating that an effective NW manager should be the type of actor who has *strategic vision, leadership skills, managerial capabilities, technical ability, marketing talent, and who is capable of coordinating and organizing different relationships*. In addition, informants also think that the effective brokers should demonstrate a *committed, credible, and trustworthy personality*.

On the three broker related factors of questions 54 (member), 56 and 58 (broker), the informants from both DNWs considered that (f) "**a power based cooperative manager...**" is important, but, however, (g) "**a knowledge based cooperative manager...**" is more important. Finally, all informants believed that (h) "**consistent management...**" is an important factor for the successful NW cooperation.

On top of their brokers' qualification preferences, as shown by data collected from questions 46/47 (member) and 48/49 (broker), the informants also expected that the broker understand their businesses to. Also desired that he/ she have abilities in accounting, international finance and investment, as well as contacts to the international market. As Mr. Jiao, the Seeds distributor, said: "*a third party actor may bring in needed resources, the Seeds broker is a research institution; a third party*

may add value in other areas.” Actors in both NWs said that such wished-for broker could contribute to the development of the business. As Mr. Liu, the Beekeepers association, said: “*a third party manager with strong professionalism helps to develop the market,*” and Mr. Xiang, the Seeds reproducer said: “*a third party manager is fine. He should know the seeds business, and it would be good if he has accounting abilities, international finance and investment and has international market contacts, therefore, concentrating on developing a big business.*” Data collected through questions 49 and 50 showed that all informants in the two DNWs responded positively to the idea of having a third party broker.

4.7.4.2 The Compound Fertilizer and Biofertilizer SNWs

The actors of the two SNWs have common views on questions 46/47 (member) and 48/49 (broker), believing that an effective NW manager should be a type of actor who is capable of coordinating and organizing different relationships while having strategic vision, management experience, professional knowledge, communication skills, and a broader social relationship network. A particular emphasis was made by those surveyed that the actors in this particular group did not appreciate traditional SOE management style. In addition, informants also think that the effective brokers should *understand all the cooperative partners* (in the NW).

On the three broker-related-factors of questions 54 (member) and 56,58 (broker), the informants from both DNWs considered that (f) “**a power based cooperative manager...**” is important however, (g) “**a knowledge based cooperative manager...**” is more important. Finally, all informants believed that (h) “**a consistent management...**” is an important factor for the successful NW cooperation. All informants responded positively to the idea of letting a third party actor play the role of broker.

4.7.4.3 The Agrochemicals and Ammonia INWs

The actors of the two INWs have common views on questions 46/47 (member) and 48/49 (broker) that an effective NW manager should also be a type of actor who is able to coordinate and organize different relationships/ cooperative partners with different cultural backgrounds, as well as possess strategic vision, management experience, professional knowledge, communication skills, and broader social relationship network. In addition, informants also thought that effective brokers should demonstrate a magnanimous and a broad-minded personal quality, individual charisma, personal resolve, analytical capability, all while giving fewer administrative orders.

On the three brokers-related factors of questions 54 (member) and 56,58 (broker), the informants from both INWs considered that “*a knowledge based cooperative manager... is more important than a power based cooperative manager...*” Finally, all informants believed that h) “*a consistent management...*” is an important factor for the successful NW cooperation.

In addition to the preferred qualifications the brokers should have, as they responded to questions 46/47 (member) and 48/49 (broker), the informants accept a third party broker but expected him to have “*broader experiences and abilities*” as Mr. Guo

former deputy director of the Agrochemicals NW, said. Further, Mr. Lu added: “ *he should have the same interests and objectives as the cooperative partners.*” Like the actors in the other NWs, in regard to questions 49 and 50, all informants in the two INWs responded positively to the idea of letting a third party actor play the role of broker. The survey results from the individual NW groups presented in this section will be consolidated into common views in the following section.

4.7.4.4 A Consolidated View of the NW Participants

Data collected through questions 46/47 (member) and 48/49 (broker) reflect the common views expressed as to effective broker characteristics as expressed by the twenty-eight informants interviewed from all six NWs. According to their common expectations, an effective NW manager should be an actor who has **strategic vision, leadership skills and managerial experience, professional knowledge** (refer to functional expertise), **communication skills and a broad social relationship network**; he should be capable of **coordinating and organizing different relationships of cooperative parties with different cultural backgrounds**. In addition, informants also felt that an effective broker should have a **responsible, understanding, trustworthy, magnanimous and broad-minded personality**. Putting together these attributes, an effective broker, should not be only capable of strategically identifying potential opportunities, and organizing relevant actors and complementary resources into appropriate cooperative arrangement, but also be capable of operationally implementing and realizing the strategic objectives through effectively managing different relationships.

Regarding the importance of the three-broker related factors for a successful NW building process, questions 54 (member) and 56/58 (broker) of the interview guide (see Appendix II) showed the responses obtained from the six NW sites ($n = 4, 4, 5, 4, 5$ and 4), as scored by all interviewees ($n = 26$) from a five-point Likert scale- where 1 = very important and 5 = not important. The survey results indicated a score of (1.6) for a knowledge NW broker and (2.1) for a powerful NW broker. These survey results concluded that **the informants from all NW groups prefer a NW broker who has knowledge, professional strategic design and implementation ability, as well as access to relevant resources, rather than to a large firm owning powerful financial and technical resources**. This particular preference to knowledge based brokers rather than the power-based brokers may be explained by the NW participants wishing that a capable broker plays roles which **serve the common interests of the NW participants as a whole rather than prioritize big shareholders' interests**. Although this was not the case in the NW groups - from observations, the informants were well informed about the stories of unbalanced alliance relationships. From the resource point of view, it is less important for the broker himself to own all the resources than having abilities of bringing the complementary resources or competences into the NW and the skill to continue managing them through coordinating various relationships. Brokers which are big firms (most of them are SOEs) in possession of powerful resources, were also viewed as likely to manage the NW through hierarchical approaches and executive orders - as practiced in the traditional SOE environment. Most of the participants in the DNW and SNW groups chose this particular type of cooperative arrangement of flexible relationships between the partners in order to allow themselves to maintain an independent status. Another explanation is that being managed by a large firm has **potential risks of having**

smaller firms being integrated into larger ones, and this was somehow disliked by the actors in the NW groups - according to observations from interviewing the informants. With a knowledge-based broker, the NW participants do not feel threatened by such a risk.

Finally, the informants considered **consistent management** to be another very important factor for the success of the NW cooperation (with a score of 1.6). That is to say, the NW participants prefer to have the same managers carrying out strategic and operational tasks all the way through the NW building process. In further explanation, NW managers who are familiar with the NW's formational history, partners' situation, and who, in particular, have personal relationships with the stakeholders, help others in the organization to better coordinate the different relationships in the NW alliances. This was found according to the analysis presented in section 4.7.2.2.

4.8 DIFFERENCES AND IMPACTS BETWEEN THE NETWORK GROUPS

Most of the sections in this chapter have so far focused primarily on the common characteristics of each pair of NWs according to the NW typological structure used in this dissertation. Despite many commonalities, data analyzed in the various sections of this chapter showed that considerable differences exist within the same types of NW group as well. To follow the dynamics of each individual NW, this section is particularly dedicated to analyzing the findings by comparing and investigating the differences within each pair of NWs, along with their major impacts to the NW building process and outcomes. The analysis is structured into three major contexts consisting of the brokers, the NW participants, and the NWs themselves.

4.8.1 The Hybrid Seeds and Honeybee DNWs

As data shown in sections 4.4.4.1, 4.6.1.1, and in the case description (see Appendix I, 1-6 and 2-6), several differences are identified between the two DNWs. These differences are summarized in Table 51, below, along the three contextual frameworks.

From the brokers' context, the organizational objective of the Seeds broker (See section 4.4.4.1) was to achieve economic benefits by commercializing proprietary technologies, becoming a research based business firm, and operating within both domestic and **international seed markets**. The Bee broker in the Honeybee NW, had a similar objective as the Seeds broker but with a focus on the **domestic market**. In the hybrid seeds business, developing an international market involves the Seeds broker's understanding of the rules, players, and market mechanisms of the foreign market. Specifically, the Seeds broker must be capable of handling the different regulatory requirements of the target countries. Depending on whether regulatory requirements directly involve importing seeds or carrying out local hybrid operation, such handlings would include contracting field trials, obtaining registrations, and coping with various foreign technical, commercial, and administrative actors. As presented in section 4.7.3.3.1 and the case description (see Appendix I, 1-6), in order to become an international player, one of the possibilities for the Hybrid seeds NW is to bring in **professional managers who have large-scale strategic and operational**

management experience in the international seeds industry to lead the business expansion. This scenario was supported by Mr. Xiang, the Seeds reproducer, through his response to questions 22 and 23 (member), 24 and 25 (broker) concerning the future NW development. He openly argued that “*professional managers should be brought into manage an expanded business operation...*” As for the Bee broker, the Honeybee NW business was also in a process of expanding from the existing local NW operation to a nationwide extent. Large-scale expansion requires a **new NW broker of strong strategic and operational management capabilities**, as analyzed in section 4.7.3.3.1.

The satisfactory performances achieved by the two DNWs were of different magnitudes - due to their respective size of operations and business nature. These performances have proved that both brokers have fulfilled their tasks of managing the present stage of their NWs’ development. However, as each NW continues to develop toward its objective, new challenges will emerge, and accordingly, brokers will be required to come up with solutions supported by new skills and expertise.

Another important difference between the two DNWs is the brokers’ **key resources**. Unlike the Seeds broker, who was in possession of a legally and technically well protected, world-leading technology of hybrid seeds, the honeybee pollination is a traditional technology and other participants in the Honeybee NW can practically carry out the operations by themselves. The Bee broker’s key competence lies mostly in the knowledge of apiculture, design systems operation, and patented equipment. He, therefore, must constantly make efforts in the area of product innovation by upgrading the level and content of these competences. As presented in the case description (see Appendix I, 2-6), the Bee broker’s new “Wall bee” research project explained one of the major initiatives in this direction.

The activity of the hybrid seeds business was a large-scale cross-region operation with relatively complicated technological content. As described in the case description (see Appendix I, 1-6), the hybrid seed business process starts from research, production and distribution of a final product to the end users and involves several partners based in different and distant geographical regions. In addition, due to the long business process, the capital requirement for financing inventory is high. While in the Honeybee NW case, the honeybee pollination service is a comparatively simple operation conducted with fewer local partners, entailing less financial resource requirement.

The differences in the objective setting and operation scale of the two DNWs imply different strategic and operational capabilities, as well as organizing efforts required for brokers to manage the respective NW operations from short and long term views.

Finally, among the participants in the Honeybee NW (in addition to one SORI and two County and Township Government actors) there is a POE actor – the Beekeepers association. This private owned actor would normally give a different cultural dimension to the NW’s management. However, it was not seen as a problem according to all the informants interviewed. This can be explained by the mutual respect and understanding between the partners developed on the bases of good previous cooperation experiences coupled with trustful relations at both organizational and individual levels (as presented in section 4.7.2.1.1). In this section, impacts resulting from **the differences of brokers’ objective setting, scale of**

operation and resource structure are found mainly in relationship to the requirements of management capabilities of the brokers - particularly in relation to the future business expansion. To cope with new challenges coming up in the transtage phase, both NWs need to develop new strategic and operational management abilities in handling larger-scale projects and more demanding business operations. Nevertheless, neither the brokers nor the NW participants from the respective NWs have such required competences. Consequently, the brokers are suggested to concentrate on the key technical aspects or their own core competences, and bring professional managers into the respective NWs who have the desired capabilities to manage the future NW development. Table 51 illustrates these differences between the two DNWs along the three contextual frameworks.

Table 51: The Main Differences between the Two Dynamic NWs

Areas of differences		The Hybrid Seeds NW	The Honeybee NW
Broker context	Broker's objectives	Has an international business vision	Focusing on domestic business development
	Brokers organizing/ coordinating efforts in relation to the NW building process	More organizing /coordinating efforts required because of: More NW participants with different professional backgrounds Complicated business activities	Less organizing / coordinating efforts required because of: Fewer NW participants Relatively simple business activity
NW participants context	NW participants combination	SORI (State owned research institutions) + Government + SODE actor (State owned distribution enterprise)	SORI (State owned research institutions) + Government + POE actors (<i>Private owned enterprise</i>)
	Geographical locations between NW participants	Long distances between each NW partner's operational sites	Short distances between each NW partner's operational sites
NW context	NW's business environment/ market	Operating on large wheat growing market (strategic crop) High national and local economic priority	Operating on smaller (niche type) market Vegetables and fruits market Local economic priority
	NW output /business activity	Researching, producing and distributing hybrid seeds product	Researching and providing honeybee pollination service
	Financial resource requirement	Large capital requirement for covering long production process	Less capital requirement. Seasonal operation
	Technology level	World leading new technology in the hybrid wheat seeds industry	Traditional, long existing technology. The broker has developed the activity into a systematic operational process and commercialize it as a service in the region
	Performance	Very successful results have been achieved at both firm and individual levels	Successful results have been achieved at both firm and individual levels

4.8.2 The Compound Fertilizer and Biofertilizer SNWs

Compared to the DNW group, the most distinct aspect between the two SNWs is that the actors who performed the broker roles were different in almost every attribute (as presented in section 4.3). The broker in the Compound fertilizer NW was a State owned distribution enterprise while the broker in the Biofertilizer NW was a private owned enterprise. The findings show that the different attributes of each broker had considerable impacts on their ways of choosing cooperative arrangements with the NW participants and managing the respective NWs.

The relationship between the five NW participants in the Compound fertilizer NW was a mix of formal and informal cooperative arrangements. As explained in section 4.6.3.2.3 and in the case description (see Appendix I, 3-6), the SODE broker originally tried to establish a fully integrated JV company. The formation of a NW of formal JV relationship with the Fertilizer producer, and less formal agreements with the other two SORI and Government participants was a result of an evaluation process. This process reflected, at least partially, the behavior pattern of a State owned enterprise in the transitional reform stage. The SODE broker's arrangement of cooperative relationship, in terms of integrating the four NW participants with differently coupled links, was to a great extent influenced by a centrally oriented traditional organizational structure. The SODE broker believed that the large number and divergent background combination of the NW participants more effectively coordinated with a relatively tight relational arrangement than a loose one. Consequently, the SODE broker spent **more efforts and costs** in forming the alliance, **by coordinating the internal activities** of the NW participants through a board of director governance structure.

Contrary to the Compound fertilizer NW, the POE broker in the Biofertilizer NW opted for a rather loosely coupled relationship pattern with the two local NW participants. This was firstly, because that, when compared to the Compound fertilizer NW, the Biofertilizer NW did not involve any joint investment of tangible assets. Secondly, the POE broker faced some uncertainties in operating in an environment which was characterized by a remote and fragmented local farming market with lower economic value. And thirdly, each of the partners was in a relatively early stage of the cooperation. These factors have contributed to the POE broker's preference of maintaining a loosely coupled relationship- at least in the initial phase of the NW operation. As presented in the case description (see Appendix I, 4-6), participants maintained complete independent status with loosely coupled but effectively coordinated cooperative relationships between them.

At the time of the investigative work of this study, both SNWs have achieved satisfactory results at a rather initial stage. On one hand, the Compound fertilizer NW successfully formed the NW organization by going through a rather long and tortuous journey characterized - by high costs in structuring cooperative arrangements and meeting the regulations and requirements of the authorities. The Biofertilizer broker, on the other hand, spent much less time and energy in forming the cooperative structure. Based on the established trusting relationships, the partners in the biofertilizer NW concentrated their efforts and resources on the joint business operation and rapidly achieved initial economic successes in the Yichuan market as they had determined.

One might argue that this analysis is performed on two cases which were, in many instances, incomparable for their differences (as listed in Table 52) of organizational size, business magnitude, technological contents, actors' profile, environment, and so on. The main argument of this section is that, from a NW point of view, ideally, the SODE broker should use a complete loose coupling structure with all four partners and still obtain all needed resources at lower cost. And as for the four other participants, they would be more focused on each of their own competences, not having to worry about the areas where they have neither responsibility nor competence to work. By cooperating with the four complementary partners on

externalized relationships, while concentrating on their own core competences of distribution, the SODE broker could attain a more flexible, effective, and powerful position in achieving his objective of maintaining a leading position in the market - in which he has had a traditionally strong customer base.

The distinct ways of organizing business activities and arranging the cooperative relationships between the NW participants by the respective NW brokers, to some extent, verifies the TC theory presented in Chapter 2 that internal cost is higher than external cost + transaction cost.

Table 52 summaries the major differences between the two SNWs based on the data analyzed in sections 4.3, 4.4. Most of these differences have direct links to the brokers of the two NWs and their roles in relation to the NW building process.

Table 52: The Main Differences between the Two Stable NWs

Areas of differences		The Compound Fertilizer NW	The Biofertilizer NW
Broker context	The role of the NW broker was played by ...	A SOD actor (State owned distribution enterprise)	A POE actor (Private owned enterprise)
	Broker's objectives	Maintaining a leading position in distribution of agricultural means /products	Achieving a leading biofertilizer supply position in the Yichuan apple growing market
	Broker's centrality was achieved / maintained mainly through...	Personal relationship Important resource (capital, market access) <i>Legal arrangement (majority shareholding position)</i>	Personal relationship Important resource (product)
	Brokers' organizing/ coordinating efforts in relation to the NW building process	More organizing / <i>internal coordinating</i> efforts were required because: The five NW participants had different professional backgrounds Complicated business activities of establishing new venture operation and process	Less organizing / coordinating efforts were required because: Fewer number of NW participants Relatively simple business activity – marketing of biofertilizer in a localized environment
	Broker's main strength	Experience, expertise and means of distribution of agrochemicals, fertilizers and other agriculture related products Financial and political support from the State	Experience and expertise of manufacturing and marketing of biofertilizer (fermentation process)
	Brokers' main weakness	Lack of industrial management experience and expertise for conducting manufacturing and researching activities	Lack of financial resource has limited the broker's endeavor in penetrating remote and fragmented farming markets
NW participants context	NW participants combination	Mainly large and Medium size State owned institutions in an urban industrial environment A Taiwanese actor	Mainly between private owned enterprises and a county level Government agent in a rural agro economic environment
	Degree of independence of the NW participants	The NW is formed by a formal JV between the broker and the Fertilizer producer; and formal agreements of relatively loose coupling relationships with the three research/government participants are between them	Each participant maintains complete independent status with loose coupling cooperative relationships between them
	Geographical locations between NW participants	The broker and NW participants are all based in a same city	Long geographical distances between the broker and the two NW partners
NW context	NW's business environment /market	Operating on a high economic value and growth farming market (cash crops supplying for the big city) More stable business environment	Operating on a remote and fragmented local farming market with lower economic value and development/ Some uncertainties
	Ecological aspects	Chemical products with relatively high ecological concerns in the country's largest city	Ecological friendly /green image, biotech solutions supported by the State and society
	NW's financial resource requirement	Capital investment required for establishing new production facility	Less capital requirement needed. The operation incurs mainly marketing cost/ expenses
	Performance	Successful results achieved in the NW formation phase	Initial success achieved in the NW development phase

4.8.3 The Agrochemicals and Ammonia INWs

According to the survey results, overall, the two INWs performed poorly when compared to the other four NWs. Nevertheless, within this NW group, the outcomes of the two NW organizations were different as well. As shown in the case description (see Appendix I, 5-6, 6-6), the Agrochemicals NW failed during the development phase while the Ammonia NW still survived and prepared for further structure and ownership reform. Table 53 sums-up these major different aspects identified between the two INWs.

Table 53: The Main Differences between the Two Internal NWs

Areas of differences		The Agrochemicals NW	The Ammonia Fertilizer NW
Broker context	The role of the NW broker was played by...	The (central) and provincial State industrial administrators	A local industrial conglomerate
	Broker's objectives	To gain a strategic position by establishing a research based and marketing oriented agrochemical conglomerate	To centrally coordinate the marketing activities of the six fertilizer producers
	Broker's centrality was achieved / maintained mainly through	Mainly by command power	Mainly through personal relationships Less by resource and command power
NW participants context	NW participants combination	The new group was formed by three large agrochemical manufacturers (producing herbicide, fungicide and insecticide) and one pesticide research institute (complementary resources combination)	The NW consists of six small ammonia fertilizer plants producing same type of product and supply to the same market (similarity of activity and resources combination)
	Degree of independency of the NW participants	Highly integrated system within one corporate structure	Centralized marketing operation Each participants maintains his independent legal status and freedom of conducting other business activities
	Geographical locations between NW Participants	The broker and NW participants all based in a same city	Long geographical distance between the broker and the six NW participants
NW context	NW's business environment /market	Large-scale national and international market	Limited local market
	Technology level	The production of agrochemicals involved high technology. The NW was in the process of upgrading its technological ability to produce better quality and new variety of products	The production of ammonia fertilizer has low technological content and in the process of becoming obsolete
	NW's internal resource	Strong financial and technical resources provided by the State Government	Weak financial and technical resources
	NW profile/ importance in the corporate strategy	High exposure State level strategic growth project	Low exposure Local strategic phasing out business
	Performance	Failed	Survives but operating in a difficult situation

From the differences listed in Table 53 above, the two **interacting dimension** differences that have the most significant impact on the building process and the respective outcomes of this particular group of NWs can be outlined. The first dimension was that China's economic reform process - as described in sections 2.4.4.1 and 4.2. These have brought very different consequences to the overall strategic direction of the two NWs. Evidently, the key changing areas analyzed in section 4.2.1 had a direct impact on the different **strategic priorities** of the two INWs - as determined by the State industrial authorities. Specifically, the central and provincial State industrial brokers determined a **growth strategy** for the

Agrochemicals NW, while the local industrial broker decided a **phase-out strategy** for the Ammonia NW. This is explained in the section 4.4 and case description (see Appendix I, 5-6 and 6-6). As a result of the different strategic priority settings, the two NWs had completely different kinds of importance exposure to the industry's development, and, therefore, received different resource allocation and support from the State authorities - despite the fact that all actors were SOEs. However, the contrasting conditions of the two NWs did not completely coincide with their results.

By holistically analyzing the survey results, one can see that the external factors of the two NWs (as shown in sections 4.7.2 and 4.7.3) had considerable impact on their building processes. They were, however, not entirely by themselves, the causes of the different outcomes of each NW. The more direct causal factors that affected the NWs' outcomes were, in fact, as a consequence of the second dimension – the internal dimension - of **the behavioral patterns of the NW participants** - and in particular **the brokers' behavior** in managing the relationships between the NW participants in the respective NWs.

In the broker context, as presented in section 4.3.2.1, the two State industrial administrators playing the broker roles were at different hierarchical levels: SBCI, the State broker in the Agrochemical NW, was a **strategic administrator**, and ZYCC, the SOIE broker in the Ammonia NW was more of an **operational administrator**. At the corporate levels, the State broker had more power and influence in obtaining important resources for the development of the Agrochemicals NW than the SOIE broker could for the Ammonia NW. At the operational level, section 4.7.3.2.3 and the case description (see Appendix I, 6-6) presented that despite all of the favorable conditions and strong resource base that were made available to the Agrochemicals NW, the organization failed completely during its development phase mainly because due to the broker's inability to handle the **internal relationship problem** between the management team members.

The Ammonia NW had an extremely weak resource base and conditions which were, nearly in all aspects, inferior to the Agrochemical NW. Moreover, it suffered the **external pressure** of an oversupply market. However, the performance measurement shown in section 4.9.1.3 indicates that the overall score of the Ammonia NW was still higher than the Agrochemicals NW ($3.3 > 2.1$). The main reason being that this NW has still survived despite extremely difficult conditions because of the broker's different leadership style - in particular his efforts to effectively handle the relationship aspects between the participants, keeping the momentum of the Ammonia NW going.

The State broker and the SOIE broker combined the activities and resources of the two respective INWs differently. The Agrochemicals NW was formed by participants who had complementary resources and activity combination - while, in the Ammonia fertilizer's case, the NW consisted of six small ammonia fertilizer plants with complete similarity of activity and resource combination. The similarity combination in the Ammonia NW had the advantage of facilitating coordinated marketing operation and cost reduction by sharing important resources. However, it had the problem of balancing the participants' capacity needs because of the over supplied fertilizer market and technological obsolescence. Likewise, a combination of similar resources and activity, in this particular case did, not create any economic scale because of the fragmented location of participant production facilities.

The other important difference is the two INWs' degree of integration. In the Agrochemicals NW, the three pesticide manufacturers and one pesticide researcher were completely integrated within a traditional organizational structure. While in the Ammonia NW, only marketing activities were integrated and the rest of the business operation remained to be independently managed by each individual plant. Compared to the Agrochemicals NW, the participants in the Ammonia NW had a bit more autonomy. Therefore the relationship between the NW participants and the broker were regulated more by market elements than by vertical control mechanisms, as with the Agrochemicals NW. To some extent, the participants (in order to retain their autonomy and independent power status previously had before the formation of the Agrochemicals NW) resisted corporate control by entering into unhealthy power struggles and political conflict which, unfortunately, the State broker was failed to managed. Consequently, the internal relationship problem became the main cause to the failure of the NW organization.

This section has followed the individual dynamics of each NW by analyzing the different aspects identified between each pair of investigated NWs. The findings showed that, despite many commonalities, considerable differences exist between the similar types of NW. Among these differences, the broker behavior patterns have the most important impacts on the NW's building processes and their outcomes. The results and performance of the NW groups are to be presented in the next section.

4.9 PERFORMANCE AND RESULTS

All sections presented in this chapter have focused on explaining the strategic processes of the NW groups in connection to actors' roles and behaviors – and particularly how NW strategies were formulated and implemented by the brokers. Based on data collected through the performance contextual questions of the interview guide, the current section focuses on examining the outcomes of each NW in consequence of the broker's role and behavior. Table 27 in section 3.3.2.3.3 has provided a performance overview of each NW through a comparative summary calculated by a seven-point Likert scale, based on data collected through questions 55 (member), 57 (broker) and 59 (stakeholder).

This section analyzes the performances of the NW groups at two levels: 1) **organizational achievements** and 2) **individual satisfactions**.

At the organizational level, question 55 (member), 57 (broker) and 59 (stakeholder) asked informants: *“To what extent have each of the following performance objectives of the alliance organization been met?”* The organizational performance measures for all NWs was composed of a list of eight criteria: **profitability, net profit for the coming year, growth, market share, prestige or positive attitude of cooperative partners, innovation, appreciation from the local government or the community, and social responsibility (and other goals)**. This question was given to all twenty-eight interviewees with twenty-six responding (93 %). Responses obtained from the six NW sites (n = 4,4,5,4,5 and 4) were then calculated by a seven-point Likert scale, which indicated both specific performance and overall performance of each NW.

Finally, questions 42 (member) and 44 (broker/stakeholders) investigated the variable of *learning* by asking the informants “*What knowledge, skills (expected and unexpected at the time of joining the cooperation) have you acquired from this cooperation?*”

At the individual level of personal satisfaction, Questions 57 (member), 59 (broker) and 61 (stakeholder) asked informants “*Are you personally happy with the outcome of this cooperation organization /activity? Why?*” and questions 58 (member), 60 (broker) and 62 (stakeholder) “*Do you think most of other individuals are happy with this cooperative organization /activity? Why?*”

As a final point, informants’ responses to questions 54 (member), 56, and 58 (broker) concerning the important factors to the successful network building process are summarized.

4.9.1 Organizational Achievements

4.9.1.1 The Hybrid Seeds and Honeybee DNWs

According to the survey results, the two DNWs- the Hybrid seeds and Honeybee NWs (n = 4 and 4) - respectively achieved the best results in all eight measures, giving the overall performance scores of (6.4) for the Hybrid seeds NW and (6.1) for the Honeybee NW. The organizational performances of the two DNWs are illustrated below in Table 54.

Table 54: Performance of the DNWs Group

To what extent have each of the following performance objectives of the alliance organization been met?		DNWs	
		The Hybrid seeds	The Honeybee
1	Profitability	6	5.25
2	Net profit for the coming year	6.25	5.5
3	Growth	6.5	6.5
4	Market share	6.25	4
5	Prestige or positive attitude of cooperative partners/members	6.25	7
6	Innovation	6.75	7
7	Appreciation from the local government or the community	6.75	6.75
8	Social responsibility (other goals)	6.5	7
Overall performance		6.4	6.1

Note: All scores are averages based on a scale of 1 = very low to 7 = very high. Samples size = 8

4.9.1.2 The Compound Fertilizer and Biofertilizer SNWs

The scored results of the two SNWs (n = 5 and 4), as shown in Table 55 below, indicate positive outcomes with an overall performance of (5.9) for the Compound fertilizer NW and (5.7) for the Biofertilizer NW.

The Compound fertilizer NW was not accounted for its quantitative results in terms of profitability, growth, and market share due to uncompleted construction of production site. Nonetheless, the market for the mixed compound fertilizer looked promising and the NW members responded rather positively to the qualitative results achieved by the NW in the areas of *prestige or positive attitude of cooperative partners* (6), *innovation* (7), *appreciation from the local government or the community* and *social responsibility* (6).

The survey results, from both external and internal points of view, reflected a sound base for the subsequent development - as analyzed in section 4.7. Table 55 illustrates the performance scores of the Compound fertilizer and the Biofertilizer SNWs.

Table 55: Performance of the SNWs Group

To what extent have each of the following performance objectives of the alliance organization been met?		SNWs	
		The Compound fertilizer NW	The Biofertilizer NW
1	Profitability	na*	5.25
2	Net profit for the coming year	na	6
3	Growth	na	5.75
4	Market share	na	5
5	Prestige or positive attitude of cooperative partners/members	6	7
6	Innovation	6.2	5
7	Appreciation from the local government or the community	5.4	6
8	Social responsibility (other goals)	6	6.25
Overall performance		5.9	5.7

Note: All scores are averages based on a scale of 1 = very low to 7 = very high. Samples size = 9

* The Compound fertilizer NW was in the process of construction, therefore no quantitative results were available

4.9.1.3 The Agrochemicals and Ammonia INWs

The survey results of the two INWs (n = 5 and 4) showed overall low performances in every measurement aspect, and with the Agrochemicals NW having the worst picture of overall performance (2.1). Comparatively, within the INWs group, the Ammonia NW (3.3) is only slightly better off than the Agrochemicals NW in only because of its technically higher qualitative performance and continued existence. The performances of the INWs group are shown in Table 56.

Table 56: Performance of INWs Group

To what extent have each of the following performance objectives of the alliance organization been met?		INWs	
		The Agrochemicals NW	The Ammonia NW
1	Profitability	1.6	1.75
2	Net profit for the coming year	2.2	2
3	Growth	2.6	2.75
4	Market share	2.4	3.25
5	Prestige or positive attitude of cooperative partners/members	2.4	4
6	Innovation	1.8	4.75
7	Appreciation from the local government or the community	1.8	4.5
8	Social responsibility (other goals)	2	4
Overall performance		2.1	3.3

Note: All scores are averages based on a scale of 1 = very low to 7 = very high. Sample size = 10

Data collected from questions 42 (member) and 44 showed that the participants from the NW groups did not explicitly plan **learning** as their major objective from the time of forming the NWs. However, most of the informants responded to questions 42/ 44 that new skills and knowledge had been acquired as a result of their participation in the NW cooperative arrangements. Table 57 provides an overview of the learning results achieved by the NW participants.

Table 57: Learning Results from NWs by the Participants

NWs	Learning results as responded by the NW participants to question 42/44	
The Hybrid seeds NW	Broker	Marketing skills, sales, and promotion Ability to coordinate different relationships Efficient use of resources The local government's field management method
	Members	New hybrid wheat seeds technology Improved technical capacity in seeds production Knowledge of the seeds market
The Honeybee NW	Broker	The importance of personal relationship Importance of Government support / influencer Market oriented research activity
	Members	Pollination technology and honeybee related knowledge
The Compound fertilizer NW	Broker	Cooperation with different partners Production technology of agricultural sciences Knowledge of Governmental project approval procedure and policies
	Members	Knowledge of product application Market information Some basic knowledge of commercial operations
The Biofertilizer NW	Broker	Plantation varieties, local culture, and marketing knowledge Pesticide product/business/ other competing products sources
	Members	New product knowledge Improved understanding in the apple growing technology Market knowledge Product knowledge and marketing knowledge
The Agrochemicals NW	Broker	Lessons of failure caused by relationship problems
	Members	Technical knowledge and management methods Important lesson – a merger or arrangement driven by administrative order has no future. Market information
The Ammonia fertilizer NW	Broker	Management experience
	Members	Have learnt nothing from the partners, because the cooperation is not a complementary one.

4.9.2 Individual Satisfaction

The individual level of performance in each NW was appraised through questions 57 (member), 59 (broker) and 61 (stakeholder) which asked informants if they felt personally happy with the outcome of the NW cooperation. Questions 58 (member), 60 (broker) and 62 (stakeholder) inquired the informants about their observations on the other individual's feeling concerning the NW cooperation. The following survey results are presented according to the individual informants' responses to the questionnaire.

4.9.2.1 The Hybrid Seeds and Honeybee DNWs

According to data collected from the informants in the two DNWs, each NW participant expressed satisfaction in relation to the rewards obtained from the NW cooperation. In the Hybrid seeds NW, as Professor Zhao said: *"I am satisfied with the cooperation. I have a sense of achievement. I think that other individuals are also satisfied with the cooperation, because each (participant) has played a role through achieving a common objective."* Mr. Xiang, the Seeds reproducer explained his feeling about the alliance: *"I am satisfied, because I have acquired knowledge, increased personal income and have won a good reputation and respect."* Mr. Liang, the Parent seeds producer said, *"I am satisfied but I am not sure about the other individuals..."* The only actor in the Hybrid seeds NW that expressed dissatisfaction about the NW

progress was the seeds distributor, Mr. Jiao: *"I am not yet satisfied because the quantity (of the seeds produced) is not big enough to generate great economic benefit."* He expressed the same opinion in section 4.7.3.2, wishing that the developmental pace could be faster to meet market demand. To some extent, this type of complaint was perceived as a positive sign by other partners because it reflected good business momentum. However, the process of development has to be controlled at an appropriate pace comfortable for all NW participants as a whole, as Professor Zhao explained in section 4.7.3.2.

In the Honeybee NW, similar responses were found. Mr. Wang, the Bee broker said: *"I am satisfied because, thanks to the positive cooperation between the partners, I felt that I have achieved something. The partners were satisfied too, because each of them received some benefits."* Mr. Liu, the Beekeeper's association representative, expressed his appreciation more along the lines of future business prospects: *"I am satisfied because of the good development prospects. Others were also satisfied with the benefits."* Mr. Xu spoke from the Township administrator's point of view: *"I am satisfied because of the success and cooperation between the partners...everyone was satisfied because of the economic benefits gained."* Finally, Mr. Sun, the Vegetable researcher, expressed the same feeling: *"I am very satisfied, because we have good results, have acquired new knowledge, have sense of achievement, and have gained income. Others were also happy."* The survey results showed that individuals in the two DNWs all felt satisfied with the results achieved in terms of both sense of achievement and practical benefits.

4.9.2.2 The Compound Fertilizer and Biofertilizer SNWs

The responses from the actors of the two SNWs were generally positive about their personal feelings towards the NW participation at this stage.

Mr. Chen, the SODE broker was happy about the way the project developed as he expressed: *"I am satisfied with the cooperation. I have a sense of achievement by fulfilling this task and I think that other individuals are also satisfied with the cooperation."*

Since less quantitative results have been achieved at this stage, due to project construction, most of the participants expressed their positive feelings towards the cooperative relationship between the partners along with confidence in the NW's future. For example the SORI actor, Mr. Zhou, said: *"I am satisfied by the cordial relationship between our cooperative partners."* And Mr. Chen, the POE actor that he was *"satisfied about the interactive relationship...the sales of product although did not move fast. But in the long run it is promising. I have confidence in the SODE broker and my own management abilities as well."* However, for Mr. Xu, the Chemical engineer, *"It is too early to say."* He felt that it would still take some time to comment on this point. Finally Mr. Tian, the government administrator, seemed to an overall summary of the status of the Compound fertilizer NW: *"I am satisfied because we have a pleasant cooperation with clear responsibility. The relationships between the partners have past bases, and there is mutual trust and friendship. From my observations in those meetings, I saw that everyone was happy and that there are no differences at this stage."*

In the Biofertilizer NW, Mr. Hao, the POE broker expressed his personal feeling: *"I am satisfied with the way we have been promoting our products under the present agricultural market. Many experts and leading personnel in the MOA considered this*

form of cooperation is an effective one. The partners are satisfied because each of them has benefited from the cooperation; we created greater customer awareness and increased sales. The Science bureau did a good thing for the local farmers by introducing new products and technology – therefore receiving praise from the local government and farmers. The Biofertilizer distributor increased sales. The ones who benefited most are the farmers because of their increased production...

Mr. Zhang Feng, the NW's operational manager, was happy about the result: *"I am satisfied for having reached the expected purpose and sales targets. I think others are also satisfied. We have plans to develop in other places in the same way."*

Mr. Liu, director of the Science bureau expressed his view from this angle: *"I am satisfied by the support we got from the enterprises (referring to the support of the Science and technology show organization, and new product introduction),"* despite the fact that some of his subordinates were unhappy about his arrangement with the Biofertilizer distributor to let him play the distribution role. Finally, the Biofertilizer distributor in the NW expressed a good opinion about participation in NW cooperation because of the business results: *"I am very satisfied, with the quality product result which is welcomed by the farmers, as well as the good personal relationships and cooperation between the partners. Others are satisfied because we can all see the future prospects based, on the current good marketing work."*

The survey results demonstrated that in the SNWs each individual was satisfied by the preliminary success of the NW operations which projected rather promising future prospects that linked to their individual interests. The individual actors in both NWs expressed especially mentioned their appreciation of the good personal relationships between the partners - considered as the basis of their cooperation.

4.9.2.3 The Agrochemicals and Ammonia INWs

In the two INWs, the overall personal reactions of the informants interviewed to the NW outcomes appeared to be negative and frustrating. In the Agrochemicals NW case, the central industrial administrator, Mr. Wang responded bluntly to question 61: *"No one is satisfied."* The former president of the Agrochemicals NW lamented: *"it was a premature project"*, implying that the decision to form the Agrochemicals NW was not strategically sound from the outset because of the environmental constraints of the SOE system. The other three former deputy directors, representing the Herbicide producer, the Fungicide producer and the Pesticide researcher all responded to the question in the same way: *"I was not satisfied and others were not satisfied either. It was a failure."*

Individuals' feelings were rather mixed in the Ammonia NW. According to Mr. Zhou, the SOIE broker: *"I am satisfied with the result of of the strategic decision implementation. Personally, I do not feel that efforts were wasted, because of the following achievements: We have reduced two thirds of the headcounts (from 15,300 people to 7,500 people), reduced over supplied product from 75,000 tons to 52,000 tons by closing down three chemical plants, we've established two new JVs with foreign investments, brought in new technologies, and reformed a number of enterprises... However, I am not satisfied with the unachieved strategic target of the Ammonia NW."* Mr. Zhou was satisfied with the overall achievement, mostly because the strategic restructuring and his direct personal responsibility. Nevertheless, he was unhappy about the rather poor operational performance of the Ammonia NW.

Mr. Liu, the GM of the Ammonia NW, had a view like the president of the Agrochemicals NW, but expressed it in more specific terms: *"I am not satisfied with the result of this cooperation. I think cooperation should be established between partners with complementary resources. Managerial personnel (GM and DGMs and some key managers) should be allowed to have a certain portion of the participation (shares); I believe this represents most of the manager's thinking. Besides, the compensation scheme for the Ammonia NW staff was not reasonable; therefore, people were not motivated. We should pay employees by their performance...the SOE system is the problem."* The two NW members responded to the question with rather straightforward dissatisfaction, as Mr. Zhou, manager of the Qingpu fertilizer plant complained: *"I am not satisfied, and according to my observations neither the others."* The manager of the Fengxian fertilizer plant, Mr. Tian echoed his colleague: *"No, I am not satisfied because we have not achieved what we had expected. Others are not satisfied neither."*

The survey results showed overall negative feelings of the part of the SOIE actors from the two INWs toward the outcomes of their respective NWs. The individuals in the Agrochemicals NW regretted the failure of the group, which was well conditioned by many external supports. However it failed because of its internal problems. The participants in the Ammonia NW had different feelings toward the NW's situation. Data reflected that, at the strategic level, the SOIE broker felt that the task was accomplished - in terms of strategic restructuring. However, speaking about the SOE revitalization - particularly in relation to the individual motivation system, the NW's current situation was negatively perceived by the participants at the operational level. All informants interviewed waited for the further structural changes by the coming reforming steps. To conclude, despite various internal and external problems as presented in the previous sections, the SOE system was, in the final analysis, blamed for the negative outcomes of the two NWs by the participants interviewed in this study.

Having now evaluated and presented the performances of the NW groups, the next section examines the key success factors to the NW building process as found in this dissertation.

4.9.3 Key Factors to the NW Building Process

Following the presentation of results and performance of each NW, this section sums up the key factors that had the greatest impact on the outcomes of the NW groups as judged by the NW participants.

Question 13 (member) and 14 (broker) asked informants (n=27) to determine the factors contributing most to the success and failure of the formation of their NWs. Results were calculated using a five point Likert scale (1 = very important to 5 = not important). According to the survey results, out of the twelve factors presented to the informants, **generating the idea of the cooperative arrangement** (1.7) **designing a good business strategy** (1.6), **ability to implement the business strategy** (1.7) and **ability to manage different partners** (1.7) were believed to be the most important factors to the performances of their particular NWs by the informants. Other important factors were **knowledge of the business and related sectors** (2), **identifying the right potential partners** (2) and **having many relevant business contacts** (2). These factors are more related to the brokers' roles during each phase of

the NW building process. However, among all of the factors, **bringing money to the cooperative arrangement** (2.2) was regarded as **the least important factor** when compared to the other factors presented by the informants from each NW.

The survey results shown in Appendix XIII coincided with the findings in section 4.7.4, which presented NW participants' preference towards broker types who have: 1) the managerial capability 2) professional knowledge 3) the ability to build interpersonal 4) a broad social network of relationships and 5) a trustworthy personality.

Finally, questions 54 (member) and 58 (broker) asked NW participants to determine, through a five point Likert scale, the most important factors to a successful NW cooperation in the areas of organizational structure, activities and resources combination, broker types, management styles, information processing and communications, and relationship patterns between the participants in the NW groups. The results shown in Appendix XIV indicate that, from the NW participants' point of view, among all factors the **trusting relationships among partners** (1.2) was considered **the most important** for successful cooperation. Concerning the organizational structure and management aspects, **consistent management** (1.6), **organizational flexibility** (1.6), **transparent NW operation information** (1.7), **active communication between partners** (1.7) and **maintaining external relationships** (versus integrated relationships) (1.8) were believed as essential factors as well. As to the form of cooperation, the NW participants expressed a clear preference to **complementary cooperation** (2) over **similarity cooperation** (3.3). Lastly, regarding the types of brokers, **a knowledge based cooperative manager** (1.6) is clearly preferred by the NW participants as compared to **a power based cooperative manager** (2.1). The combined survey results are in line with the findings presented in the previous sections of this chapter.

4.10 CONCLUSION

This chapter displayed the data collected through interviews in the six NW sites and presented an analysis, coupled with a framework of the selected variables that were outlined in Figure 30 in section 4.1. To conclude Chapter 4, Table 58 presents an integrated view of the major findings of each NW along with the key NW variables analyzed. Next, Chapter 5 will introduce the overall findings of this dissertation.

Table 58: An Integrated View of the Findings Concerning the NW Variables Analyzed

Key variables analyzed		DNWs		SNWs		INWs	
		Hybrid seeds	Honeybee	Compound fertilizer	Biofertilizer	Agrochemicals	Ammonia
ACTORS	Type of actors	SORI/ SODE/ POE/ Government actors				SOIE actors (one SORI)	SOIE actors
	Activities combined	Synergies/complementary activities in seeds production/ bee pollination service		Upper stream/ down stream operation of producing /distributing mixed compound fertilizer/ Biofertilizer business		Similarity of combined activities for producing /supplying Agrochemicals / Ammonia fertilizer	
	Broker roles by	The SORI actors		The SODE actor	The POE actors	The Industrial administrators	
ENVIRONMENT		China's economic development, reforming process brought both opportunities and challenges to the actor groups. Key areas of change: governmental deregulation process, technological development, market changes and China's WTO accession have had the most direct and important impacts on actors' strategic conduct in forming NW alliances.					
OBJECTIVES	Individual actors objectives	Responding to growth opportunity / Improving product quality/ A chance to survive / Gaining market shares / Gaining organizational flexibility /Incentives of engaging in economic activities / Sharing R&D, HR, marketing costs expenses with partners / Accessing financial resources / Learning					
	The NW objectives	To jointly achieve successful business results of the NWs which satisfies all participants' individual objectives				To gain a strategic position	To centrally coordinate marketing activities
	Initiation	Initiated by market/ brokers' efforts, and participants' own decisions				Initiated by the command/ Decisions of the brokers	
ACTIVITIES RELATIONSHIP PATTERNS	Centrality	Brokers have high centralities due to positioning/key resource/relationship/trust				Brokers have high centralities due to command power and positioning	
	Structural holes	Cooperation with partners of maximum nonredundancy primary contacts/ diversified resources/competences; brokers have the largest volume of structural holes between its contacts functioning as ports of access to a great number of clusters of secondary contacts. Brokers/NWs enjoy more benefits of information, opportunities/ impending disasters.				The clusters of contact are almost completely redundant at both primary and secondary levels given the two NWs poor structural holes/ NW benefits.	
RESOURCES COMBINATION		Complementary resources were combined by the actors in the five NWs					Similarity of resources
ROLE DISTRIBUTION, ACTOR'S BEHAVIOR IN THE NW BUILDING PROCESS	Broker	Creator during formation phase, lead operator during developmental phase. Coordinating relationships among the partners and other stakeholders/, strategic leadership of the cooperative organization/ operational coaching and facilitating the cooperative organization/ New business development.					
	Management styles	People oriented, personal communication Balanced evolutionary process for individual /NWs Provided information suitable for the information-processing capacity of each NW member.				Task oriented, autocratic approach; Impersonal approach to conflict resolution	
	NW members	Mutual respects /understanding between the partners; good previous cooperation, trustful relations at organizational /individual levels.				Limited information	Adequate information
RESULTS AND PERFORMANCE		High NW performance/ individual satisfaction		Successful initial results, high individual moral		Organiza- tion failure	Poor performance

5 CONCLUSIONS AND IMPLICATIONS

5.1 INTRODUCTION

This chapter draws conclusions about the research problems and questions using a three-link structure.

Following the introduction, section 5.2 begins by presenting the most important empirical findings of each NW between the key NW variables and the research questions identified in Chapter 1.

Section 5.3 links the various theoretical approaches reviewed in Chapter 2 to the research questions.

Based on the integrated views of empirical and theoretical links, section 5.4 presents conclusions concerning this study's focal theme - broker links to the future development of strategic NWs by introducing a new model of broker.

The findings presented in the three sections are finally, summarized into a condensed insight in section 5.5. The chapter finishes by explaining research limitations and what kind further research is needed.

As determined from the outset, the objective of this study is, through investigating the research questions identified in Chapter 1, to gain a holistic view of the strategic process of NW building in China's agribusiness sector during the transitional economic stage - with special light shed on how strategies were formulated and implemented by the actors who played brokers' roles. The relevant data to the research questions was collected according to the methodological approach laid down in Chapter 3. Chapter 4 investigated the research questions through analyzing the key variables in connection to the data collected from the NW groups. This dissertation has contributed to strategic management literature in the following ways:

- by empirically examining the major process variables related to performance in differently formed and evolving NW organizations in the Chinese agribusiness sector
- by investigating the roles and behaviors of brokers in relation to the strategic NW building process, as well as the outcomes in the Chinese agribusiness sector
- by presenting research insights into strategic alliances between multiple Chinese firms, with diverse ownership structures, from a NW perspective. This sets it apart from most literatures on the subject of Sino-foreign joint ventures or other relatively formal structures of cooperative arrangements between the traditional cooperative structures of two partners
- by enriching the body of knowledge regarding strategic NWs among Chinese agribusiness firms, in the context of China's transitional economy process
- and, finally, by exploring a new model of broker (in section 5.4) whose role fits better to the agribusiness sector in China (or other emerging market as well) during a transitional economic stage.

5.2 EMPIRICAL LINKS TO THE RESEARCH QUESTIONS

This section presents the most important empirical findings of the NW groups along a framework - integrating the relationships between the key variables analyzed in Chapter 4 and the research questions.

5.2.1 The Hybrid Seeds and Honeybee DNWs

To begin with, in relation to the research questions, Table 59 sums up the most important empirical findings of the Hybrid Seeds and Honeybee NWs.

Table 59: The Hybrid Sees and Honeybee DNWs

Key variables	RESEARCH QUESTIONS					
	Factors influencing actors' strategic conduct in forming NWs		Causes of the NW outcomes		The effectiveness of broker's role in building strategic NWs	
	Hybrid Seeds	Honeybee	Hybrid Seeds	Honeybee	Hybrid Seeds	Honeybee
Environment	Deregulation of financing policy to researchers Legislative improvement on intellectual property protection Market uncertainty		Favorable economic conditions China's agriculture/ rural development State support (new five year plan)		Broker used a loosely coupled cooperative arrangement which suited the characteristics of the transitional economic environment and partners' needs of maintaining their independent legal status and keeping other commitments	
	Growth potential of seeds business Globalization/ WTO /Reform of distribution system	Opportunity of pollination service	Enactment of the seeds law in 2001	Increase of ecological awareness		
Actors	Common interests		Capability of each individual participant Good relationship and trust between the partner firms and individuals		Identifying / putting together actors with right synergies into the NW Developing trust between actors and coordinating relationships/business operations	
	SORI/SODE actors and County/ Township administrators	SORI/POE actors and County/Township science administrators				
Objectives	Actors - growth opportunity, product quality, incentives of economic activities, learning, market share, reducing uncertainty and sharing cost		The brokers' effective integration of partners' individual interests into a common NW objective and managed congruent pace/process in realizing the objectives			
	The Seeds broker - to become an international hybrid wheat seeds company	The Bee broker- to become a leading bee pollination/ green food firm in China				
Resources	Complementary resources combination		The brokers' organizing efforts in identifying nonredundant actors with complementary resources and persuading them to form NW alliances			
	Financial resource constraints					
Activities/ Relationships	Complementary combination of activities Loosely coupled systems Interdependent relationships between the NW participants				The brokers may have to rearrange the cooperative relationship due to tendencies of tighter coupling systems	
Roles/ Behavior	The business required cooperation between several functions Each actor has a distinct role to play in the value chain process Knowledge of other role players		Individual actors' capability Cooperative behavior between the NW participants The effective broker's role and management style		Creator -Formation phase Lead operator-Development /Transtage phases (Broker roles in Table 64)	

5.2.1.1 The Environmental Aspects and the Research Questions

According to the investigation of section 4.2, the most important environmental factors that influenced **the actors' strategic conduct** in pursuing NW alliance relationship in the two DNWs were, first, the changes brought on by the **deregulation** concerning financial allocation policy to the research institutions. Likewise, the change of the distribution systems of agriculture production materials as section, 3.3.2.3.2.4 presented, has had a direct influence on the Seeds distributor's participation in the Hybrid Seeds NW. Secondly, the increasing **globalization** process, underscored by the recent **WTO accession**, has created a growth opportunity for the seeds business (as presented in section 3.3.2.3.2.2) while simultaneously posing a threat of competition. The demand of effective solutions to the local fruits and vegetable production created an opportunity for the participants from the Honeybee NW.

Section 2.4.4.1.5 indicated another positive factor which encouraged the SORI actors to use their new technologies in cooperating with other actors was the legislative improvement on **intellectual property protection**. Further, to minimize certain market **uncertainties** created by the changing transitional economic process, the actors preferred to form alliances with other competent partners rather than to venture alone.

According to the analytical results of section 4.9, the two DNWs have performed successfully on both organizational achievement and individual satisfaction. The relevant factors to the second research question from the external environmental perspective, according to the data analysis, are mainly due to the factors of the overall **favorable economic conditions** of the national economy - as presented in section 2.4.4.1 - and in particular **China's agricultural development**. Concurrently, **State support** (in terms of priority setting of the agriculture in the new Five Year Plan as presented in section 2.4.4.1 and enactment of the seeds law in 2001 as presented in section 3.3.2.3.2.2) all have provided favorable environmental conditions to the seeds business.

Section 4.2.3.1 explained the relationship between the external environmental aspects to the research question concerning effective brokers' roles in relation to the successful results of the two DNWs. To operate in a business environment of a transitional nature, the Seeds broker and Bee broker chose a similar model of **loosely coupled cooperative arrangement** - but still effectively coordinated business operation with other business partners who had special competences which were more suitable to the **transitional economic environment** - in addition to the typological characteristics of dynamic NWs.

5.2.1.2 The Actors Aspects and the Research Questions

Section 4.3 introduced the actors from the two DNWs who, although specialized in different functions, had **common interests** in the joint business activities. However, each had only one **core competence** relevant to the functions in the value chain of the respective business processes. By cooperating with other partners, the actors could **combine their complementary strength at lower costs** - the primary motivation to form the NWs from the actor's perspective. Along with this, each of the participants still kept his original activities and obligations in addition to the alliance commitment. The NW form alliance was perceived by the participants from the two DNWs as a

suitable cooperative model because it allowed the participants to maintain their independent entity positions while contributing to the NWs' operation, being free to retain their **other commitments and duties**.

The group of actors in the Hybrid Seeds and Honeybee NWs characterized a pattern of "right partners" in the strategic alliance. The link between the actors aspects and the causes of the two NWs' outcomes were demonstrated mainly by the resulting good relationships between the partner firms and individuals.

The contribution of the Seeds broker and the Bee broker - in relation to the variable *actors* - was reflected mainly by their effective **organizing efforts in identifying and putting together actors with the right 'chemistries'** into the respective DNWs from the outset of the NWs' formation.

5.2.1.3 The Objective Aspects and the Research Questions

Section 4.4.4.1 showed that in the two DNWs, the individual objectives of each actor were different as a result of each actor's organizational and business nature. Nevertheless these individual objectives were commonly grounded with respect to their decision of forming the NW alliances which **accommodated the actors' interests** of responding to growth opportunity, improving product quality, incentives of engaging in economic activities, learning, gaining market share, reducing market uncertainty and sharing cost. Concerning the objectives of the two brokers, the Seeds broker had an objective to become a research based international seeds firm while the Bee broker aimed to achieve a leading position in the bee pollination business in the domestic market.

The objective aspects (with regard to the satisfactory performances of the two DNWs) and the roles of the two brokers were mainly demonstrated by their **effective integration of partners' individual interests into the common NW objectives** during the formational phase and, subsequently, managed congruent paces of development processes of achieving the NWs' objectives as well.

5.2.1.4 The Resource Aspects and the Research Questions

From the resources perspective, the factors that influenced the actors in the two NWs' formation were mainly because of the **complementary combination** of each actor's resource - as described in section 4.5.2.1. Since **no individual actor had all the necessary resources** required to achieve his objectives, one of the important points of the actors' - in relationship to NW cooperation, was to share needed resources from other partners at low cost and low risks.

Data analyzed in section 4.2.3.1 demonstrated that the actors in the two DNWs considered complementary resources as an important criterion of the **preferred cooperative arrangement in the agribusiness sector**. Consequently, the complementary combination of resources was one of the direct causal factors to the successful performances of the Hybrid Seeds and Honeybee DNWs.

Concerning the effectiveness of the broker's function, the complementary combination of resources in the two DNWs (as presented in section 4.5.2.1 and the

case descriptions) (see Appendix I, 1-6 and 2-6) reflected the two brokers' effective organizing efforts in **identifying nonredundant actors with complementary resources** and persuading them to form the respective NW alliances.

5.2.1.5 The Activities and Relationship Aspects and the Research Questions

The processes between the original activities attributed to each actor before their joining the two DNWs (introduced in section 4.3,) and the combined activities in the hybrid seeds business and the bee pollination service operations (described in section 4.6.1) have indicated that only by combining the activities of each individual actor, could they have achieved the objectives presented in section 4.4.4.1. Therefore, **combining the activities** from the complementary partners was one of the important factors influencing the actors' strategic conduct in the formation of the Hybrid Seeds and Honeybee DNWs.

The survey results presented in sections 4.6.1.1 and 4.9.3 showed that as one of the major causal factors, from the activity perspective, the successful results achieved by the actors in the two NWs was attributable to the **complementarity of activities combination** among the NW participants.

Section 4.6.2.2 also analyzed the data which indicated some possible disadvantageous aspects of the complementary combination of activities in a NW - such as **communication barriers** between the partners from different professional fields and **risk of losing knowledge**. However, no empirical evidences of such issues have been found so far in the group of NWs of this dissertation. This, according to the data analyzed in section 4.6.3, can be explained by the previous cooperative experiences between partners with different professional expertise, but in the same relevant business sector, and a preinvested **trusting relationship** between the NW partners.

The roles of the Seeds broker and the Bee broker, concerning the activity aspects merited mainly by their effective actor organizations, were not only **nonredundant** to each other's activities, but also relevant to the specific function in the value chain processes of the seeds and the bee pollination businesses - as described in section 4.6.1.1.

The actors' activities in the two DNWs, as presented in section 4.6.3, were combined by **loosely coupling systems** or **informal cooperative arrangements** between the cooperative partners. This **interdependent** cooperative relationship pattern between the NW participants was considered particularly advantageous for its **flexibility and effectiveness** - as explained in section 4.6.3.2.1. In addition, section 4.6.3.1.2 described the evolutionary characteristics of the informal cooperative relationships between the NW participants, which emphasized previous cooperation experience between the partners. Section 4.6.3.2.3 observed through this study's investigation that the actors of the **market initiated NWs** also preferred loosely coupled cooperative arrangements. Finally, with continuing development, the two DNWs (as suggested by section 4.7.3.3.1) could encounter **new activities and relationships** when entering into the **transtage phase**. Accordingly, the brokers would be required to play **new roles**.

5.2.1.6 The Roles and Behavior Aspects and the Research Questions

Section 4.7.1 described that each of the participants in the two DNWs played a **distinct function in the value chain process** of the hybrid seeds and bee pollination businesses.

As explained in 4.6, from previous cooperation experiences, the participants knew enough about each other and their capabilities and valuable roles. This recognition, or **knowledge of the partners' specific expertise and competence**, added confidence to the individual actors enabling them to participate in the NW cooperation with more commitment. And these objectives could be only achieved through cooperation between several capable functions as analyzed in the previous sections.

Section 4.6.1.1 demonstrated the effective operational processes of the seeds and bee pollinating businesses. Their businesses demanded that each NW participants' fulfill his specific tasks in the value chain on time, and with good quality. Therefore, **the individual actor's ability** to deliver results was one of the important factors contributing to the good results of the two DNWs. Section 4.7.2.1 described that the main characteristic of the cooperative behaviors in the two NWs was such that each actor respected the valuable roles played by his NW partners. As a result, the NW's operations directly benefited from **cooperative behaviors and trusting relationships** between the participants.

Sections 4.7.3.1.1 and 4.7.3.2.1 explained that, among the different tasks accomplished by the NW members, the Seeds broker and the Bee broker contributed particular success to the NWs' results through effectively performing their roles of a **creator** during the **formational phase** and a **lead operator** during the **developmental phase**. For the further sustainable development of the NWs during the **transtage phase**, section 4.7.3.3 argued that the expansion of the Hybrid seeds NW into the **international seeds market** would require a broker who is capable of managing different challenges than experienced during the previous phases. Likewise, the further business development of the Honeybee NW would also demonstrate the limitations of the present broker in terms of his **large-scale business operation** management experience. To ensure the continual success of the NWs, the brokers' roles have to be effectively performed. Consequently, section 4.8.1 suggested that, when entering into the transtage stage, **professional brokers with necessary skills and experiences** should be brought in from the outside to manage the two DNWs.

Compared to the other NWs selected in this research, the two DNWs have more **common grounds** than other NW groups do. This is mainly because the actors who played broker's roles were from the same parent organization and both were SORI actors. These brokers' common ground, to a great extent, **shaped a similar approach** in handling relationships in the respective NWs. In addition to the brokers' context, the majority of the NW participants in both NWs were the County and Township agrotechnical administrators, each with rather identical concerns to the NW cooperation and operational styles. These key common grounds coincided with the findings in section 4.8.1 and concluded with the same managerial suggestion of calling for a change of brokers with greater professional skills and experience to manage the respective NWs' when they enter into the transtage phase.

5.2.2 The Compound Fertilizer and Biofertilizer SNWs

Table 60 presents the most important empirical findings of the Compound fertilizer and Biofertilizer NWs – carried out along a framework integrating the analysis of relationships between the key variables with respect research question Responses.

Table 60: The Compound Fertilizer and the Biofertilizer SNWs

Key variables	RESEARCH QUESTIONS					
	Factors influencing actors' strategic conduct in forming NWs		Causes of the NW outcomes		The effectiveness of broker's role in building strategic NWs	
	Compound F	Biofertilizer	Compound F	Biofertilizer	Compound F	Biofertilizer
Environment	Growth potential of the products (Compound fertilizer and the Biofertilizer) Globalization/ WTO accession/market changes/ competition		Favorable economic conditions China's agriculture/ rural development State policy encouraging private sector business		Used a tight/ loose coupling systems to meet the requirement of the authorities	Used a loosely coupled cooperative arrangement between the participants suitable for a business environment of uncertainties
	Reform on researching fund and distribution system	A remote market with difficult business conditions	Market demand of the compound fertilizer	The increasing ecological awareness on biotech solutions		
Actors	Common interests		Capability of each individual participant Good relationships and trust between the partner firms and individuals		Identifying / putting together actors with correct synergies into the NW Developing trust between actors and coordinating relationships/business operations	
	SODE/ SORI /POE actors and Provincial agrotechnical administrator	POE/ SORI actors and County science administrator	Majority SOE participants	Majority POE participants	SODE broker	POE broker
Objectives	Actors - growth opportunity, product quality, incentives of economic activities, learning, market share, reducing uncertainty and sharing cost		Effective integration of partners' individual interests into a common NW objective			
	The broker – to maintain a leading supply position	The broker – to penetrate into a new market	A time consuming / costful formation process	Rapid establishment of market position	Restructured cooperative arrangement	Managed a congruent pace/process
Resources	Complementary resources combination					
	Limitation of individual competences	Financial constraints	Broker's organizing efforts in identifying nonredundant actors with complementary resources and persuading them to form the NW alliance			
Activities/ Relationships	Complementary combination of activities Interdependent relationship between the activities and the NW participants					
	Partners' previous good relationships	Good experiences based on initial cooperation (exhibition)	Tight/(loose) coupling systems	Loose coupling system	A complete loose coupling system could create the NW earlier/gain time to market	An emerging tendency of tighter coupling systems
Roles/ Behavior	The business required cooperation between several functions Each actor has a distinct role to play in the value chain process Knowledge of other partners		Individual actors' value adding function Cooperative behavior between the NW participants		Creator -Formation phase Lead operator-Development phase (initial stage)	
			Formal and procedure orientation	Informal and market orientation	(Broker roles in Table 64)	

5.2.2.1 The Environmental Aspects and Research Questions

As presented in section 4.2, the environmental factors which influenced actors' strategic conduct in pursuing NW alliance relationship in the two SNWs were particular to each actor type. For the SODE broker, the **reform of the distribution systems** of agriculture production materials, as section 3.3.2.3.2.4 presented,

constituted a major strategic need for forming the Compound fertilizer NW. Besides, the SODE broker also intended to use the NW organization as a pre-empt strategy in fighting against competitors from other provinces, and especially international fertilizer firms coming in as a result of the **globalization process**. The Biofertilizer broker however, was more concerned about how to use a NW strategy in penetrating remote markets.

The SORI actors' participation in the NW alliances in both SNWs (as in the other NWs groups) were influenced mainly by changes brought by **deregulation** with regard to financial allocation policy to the research institutions, as well as legislative improvement to **intellectual property protection**.

As to the private actors, the Taiwanese Fertilizer producer in the Compound NW and the Biofertilizer distributor in the Biofertilizer NW, the decision to participate in the NWs were mainly driven by a common factor - the **growth potential** of the compound fertilizer and the biofertilizer businesses in their respective regions. Other contributing factors motivating the actors in the two SNWs consisted of reducing uncertainties created by the **market changes**, presented in section 4.2.2.2, and the changing transitional economic.

The environmental links to the initial satisfactory results obtained in the two SNWs, as presented in section 4.8, were like other successful NWs in this research, mainly due to the factors of an overall **favorable economic condition** of the national economy (as presented in section 2.4.4.1) - and in particular, **China's agricultural development**. In addition to **State support** of the agriculture industry (as presented in section 2.4.4.1) sections 4.2.1.1.3 and 4.3.4 indicated that State support to the private business sector had a particular impact on the POE actors in making them actively pursue their economic objectives through forming strategic alliances with other types of actors. Compared to the Compound fertilizer NW, an additional environmental dimension in favor of the Biofertilizer NW's business was the increasing demand natural food. The demand was driven by growing social awareness and ecological concern in China which, in turn, motivated the farmers to use more biotechnological solutions than chemical products.

Section 4.6.3.2.3 showed the relationship finding between the external environment aspects and the brokers' roles. In the Compound fertilizer NW, the SODE broker used a mixed coupling system. Section 4.8.2 assumed that had the broker used a loose coupling system for all the participants, not only the bureaucratic process could be avoided, but also, more than six months of time and costs associated with the NW's formation could have been saved and, more importantly, the NW could have gained an earlier market entrance. Contrary to this practice, the Biofertilizer broker managed a loosely coupled cooperative arrangement between the four actors and spent no time and cost on the **formalities** of formational procedure. Consequently, the Biofertilizer NW's formation process completed at the same time that the initial business result was achieved.

5.2.2.2 The Actors Aspects and the Research Questions

One noticeable phenomenon concerning actor aspects in the two SNWs, as presented in section 4.3, was that in the Compound fertilizer NW the majority of the participants (including the broke) were SOE organizations. Contrary to that, most of the partners,

including the broker in the Biofertilizer NW, were POE actors. Despite the differences between them, the **common interests** (as explained in sections 4.3 and 4.4.4.2) drove the actors' strategic conducts in the formation of their respective NW alliances.

The actors' attributes, in relation to the NWs' performances, were reflected by their corresponding behaviors. In the Compound fertilizer NW, analysis showed that the SOE actors which were used to functioning within an **integrated organization structure** tended to follow the **bureaucratic procedure** - as they had traditionally practiced. Thus, a lot of time and high costs were entailed in adapting themselves to a structure which met bureaucratic requirements (see Appendix I, 3-6). Contrary to the actors' behavior in the Compound fertilizer NW, a POE dominant group of actors in the Biofertilizer NW demonstrated strong **entrepreneurial spirit** by concentrating on their mutual business objectives rather than the formational formalities - consequently achieving good business results (see Appendix I, 4-6).

The common aspects of the actor links to the good initial results of the two SNWs also included those factors presented in the previous sections - such as the relevance of each actor's **individual capability** and **willingness** to combine their strength in a complementary setup. Section 4.7.2.2.2 showed the actors' attitude toward the importance of **personal relationship and trust** and concluded that good cooperative relationships between the partner firms and individuals contributed significantly to the NWs' successes.

Section 4.6.1.2 and the case descriptions (see Appendix I, 3-6 and 4-6), presented the outcomes of the two NWs in relation to the different approaches used by the individual brokers. According to the findings, the different actors' attributes (in relation to the coupling systems used between the cooperative partners in the two SNWs) reflected the **different management thinking and styles** of the two brokers. Namely, the formal relational arrangement used by the SODE broker emphasized the more **traditional command** type hierarchical organization structure with tight contractual control. While the loose coupling system used by the POE broker in the Biofertilizer NW emphasized more on **market mechanisms and relationships**.

Sections 4.7, 4.8.2 and the case descriptions (see Appendix I, 3-6 and 4-6) explained that, in forming the two NWs, **identifying and convincing the right partners**, **developing trust** and subsequent **coordinating efforts** of their activities and relationships, were the most important contributions of the two brokers - in the context of actors aspects in the SNWs.

5.2.2.3 The Objective Aspects and the Research Questions

Section 4.4.4.2 explained that the actors' decisions to form strategic NW alliances with each other were because of their **individual objectives** (responding to growth opportunity, improving product quality, incentives of engaging in economic activities, learning, gaining market share, reducing market uncertainty and sharing cost) were complementarily accommodated by **the overall NW objectives**.

As core firms, **the brokers' objectives were the basis or starting point of the NW objectives**. The SODE broker's objective in forming the NW was to maintain a leading position in distribution of agricultural materials and products. In the

Biofertilizer NW, the POE broker had an objective of becoming a market leader in the Yichuan region. Section 4.4.4.2 demonstrated that both brokers' objectives had, in principal, complemented the other individual actors' interests and objectives, therefore motivating the actors to form the respective NWs.

Section 4.9 presented the performances of the Compound fertilizer NW as a satisfactory result based on the data collected from the NW's participants. However, section 4.8.2 suggests that had the SODE broker used a loosely coupled cooperative arrangement for all participants from the outset, better results (in terms of early NW formation and market entrance) could have been achieved. The insistence on an **integrated structure** by the SODE broker and other SOE actors in the NW reflected a traditional **SOE influence**, with respect to the organization structure and partner relationships.

The POE broker in the Biofertilizer NW, as presented in section 4.6.1.2, used a loosely coupled cooperative arrangement between the NW participants and, thusly, **avoided time consuming and costful processes** of formational formalities, and was able to rapidly establish its market position - a significant step towards realizing the NW's objectives.

Similarly, as presented in the previous section 5.2.1.3, the process of integrating partners' individual interests into the common NW objectives during the formational phase, and the subsequent management of congruent paces of developmental processes, demonstrated the relevance of the objective aspects - this in regard to the performances of the SNWs and the roles of the two brokers.

5.2.2.4 The Activities and Relationship Aspects and the Research Questions

Complementarity of activities combination, as presented in section 4.3, was an important factor in influencing the actors' strategic conduct in forming the Compound fertilizer and Biofertilizer NWs. The explanation of the activity link to the actors' decision in forming NW alliances was given by section 4.6.1.

From the activity point of view, as presented in sections 4.6.1.2, the satisfactory results achieved by the actors in the Compound fertilizer and the Biofertilizer SNWs were due to the complementarity of activities combination between the NW participants. Since the actors' activities in the two SNWs were combined through different forms of cooperative arrangement (a relatively **formal cooperative arrangement** between the participants in the Compound fertilizer NW on the one hand, and an **informal arrangement** in the Biofertilizer NW on the other hand), the results were, consequently, different - as analyzed in section 4.8.2.

The possible disadvantageous aspects of complementarity of activities combination, analyzed in section 4.6.2.2, were neither a problem in the Compound fertilizer NW nor in the Biofertilizer NW. Since both SNWs were still in a relative early stage of development, it is assumed that with further development, some differences in terms of communication and understanding might emerge, as informants commented in section 4.6.2.2.

Once again, regarding the brokers' functions (but this time from an activity perspective) as explained in the above sections the differences of the brokers'

efficiency in relation to the NW building process were demonstrated by the different coupling systems the individual brokers used in the two NWs. The loosely coupled cooperative arrangement in the Biofertilizer NW enabled the actors' activities during the formational phase to be effectively focused on the NW **business operations**. However, the actors' activities in the Compound fertilizer NW were focused more on making a **formal arrangement** between the partners. The different preferences of the actors in the market initiated NWs and the command initiated NWs observed by section 4.6.3.2.3 were again proved to be the case in the SNW groups.

Despite the differences resulting from the coupling systems opted by each broker for the respective NWs, one common ground pertaining to the relationship pattern is that, according to the survey results reflected in section 4.6.1.2, strong **interdependent relationships** between the actors in both NWs were evident. Evolutionary characteristic of the informal cooperative relationship between the NW participants and the previous experience of cooperation perceived by the partners as described in section 4.6.3.1.2 were also found important in the building process of the two SNWs.

Concerning broker roles, Section 4.6.1.2 recognized the effective roles played by the SODE broker and the POE broker in organizing the actors whose activities were relevant to the specific function in the compound fertilizer and biofertilizer businesses activity chains.

5.2.2.5 The Resource Aspects and the Research Questions

Section 4.5.2.2 presented that the **complementary combinations of resources** were the main factors influencing the actors in forming the two SNWs. Since no one had **"enough"** resources in achieving his individual objectives, therefore, sharing the needed resources from the complementary partners became necessary. Furthermore, as the survey results in section 4.2.3.2 indicated that, compared to the cooperative forms of wholly owned enterprise and a JV structure, the NW form of cooperation was preferred by all informants interviewed as a **suitable form** of cooperative arrangement in the present agribusiness sector.

Table 41 of section 4.5.2.2 showed that the resource combinations between the actors contributed to the formation of the Compound fertilizer NW and to the good results achieved by the actors in the Biofertilizer NW.

Concerning the resource links to the brokers' roles, the findings were similar as in section 5.2.1.4. - Specifically, the brokers' organizing efforts in **identifying nonredundant actors with complementary resources** and persuading them to form the NW alliances - as presented in section 4.5.2.2 and the case descriptions (see Appendix I, 3-6 and 4-6) - were the major tasks they had fulfilled for the formation of each NW.

5.2.2.6 The Roles and Behavior Aspects and the Research Questions

Section 4.7.1 presented the changing process of the roles and behaviors of the particular actor groups in the SNWs. Sections 3.3.2.3.2.4 and 4.2.1.1.2 explained that, since the reform, many new competitors challenged the previous exclusive role of distribution played by the SODE broker. To survive, the SODE broker had to change his previous **reactive** attitude and operational style into a **proactive** one- and actively

pursued competitive strategies, such as the formation of the Compound fertilizer NW. Section 4.2.1.1.1 indicated the similar process and rationales which influenced the SORI actors to perform additional new roles with commercial dimensions, and likewise, the reason of their decisions for participating the NW organizations.

Sections 4.2.1.1.3 and 4.7.1.3 presented that the POE actors also played important roles in the NW groups of this research, such as the Fertilizer producer in the Compound fertilizer NW and the POE broker and the Biofertilizer distributor in the Biofertilizer NW. Furthermore, the change of behavior of the Government actors manifested from their previous controlling functions to the present **facilitator roles** in each NW investigated in this study.

The roles and behavioral links to the NW performances were seen from section 4.6.1.2 and the case descriptions (see Appendix I, 3-6 and 4-6), which presented how the actors in the Compound fertilizer NW contributed to the NW creation from each of their **individual competences**. From the same data, the effective roles played by each individual actor in the Biofertilizer NW in carrying out joint marketing operations were also presented. One **common ground** identified in relation to the results achieved in the respective SNWs was the partners' **cooperative behavior and trusting relationships**. These were again found to have a link with previous cooperation experiences between the actors, as shown in section 4.6. Corresponding to the explanations in the preceding sections, the two major actor groups - the SOE actors in the Compound fertilizer NW, and the POE actors in the Biofertilizer NW -, behaved differently with regard to organization structure and cooperative arrangement due to their different backgrounds. These differences have direct impact on the outcomes of the respective NWs. The case description (see Appendix I, 4-6) also indicated the importance of the **facilitator role** played by the County government actor in the Biofertilizer NW.

According to section 4.9.1.2, the Compound fertilizer NW's performance was measured by the results achieved during the formational phase, while the Biofertilizer NW's included the initial stage of the development phase. The SODE broker played a **creator** role in the setting up of the Compound fertilizer NW. And, along with its creator role, the POE broker also played a **lead operator** role for the initial stage of the development phase. Sections 4.7.3.1.2 and 4.7.3.2.2 presented the behavioral differences between the SODE broker and the POE broker in terms of their approaches of organizing business activities and arranging relationships have different impacts on the building process of the respective SNWs.

Finally, section 4.7.3.3.2 predicated that, in the Compound fertilizer NW, the developmental trends tended to be stabilized in a direction of consolidating the upper and down stream operations. The SODE broker, in addition to his **functional role** of product distribution, will continue to perform the lead operator role for a considerable time to come. However, with ongoing environmental process changes, **a either looser or tighter form** of partners' cooperative relationships may call for rearrangements - especially for the SORI actors. The rearrangement of cooperative relationships between the partners was a tendency also found in the Biofertilizer NW. As the NW continues to develop, the local partners expected a tighter form of partners' relationships. Consequently, the POE broker would continue to play a lead operator and a functional role of producer. For both brokers, when entering into the **transtage phase**, expansions into new geographical market territories or business segments

would create **new activities and relationships** to manage, therefore, their roles may have to be adaptive according to the new requirements.

5.2.3 The Agrochemicals and Ammonia INWs

Table 61 presents the most important empirical findings of the Agrochemicals and Ammonia INWs along a framework which integrates the relationship analysis between the key variables and each research questions.

Table 61: The Agrochemicals and Ammonia INWs

Key variables	RESEARCH QUESTIONS					
	Factors influencing actors' strategic conduct in forming NWs		Causes of the NW outcomes		The effectiveness of broker's role in building strategic NWs	
	Agrochemicals	Ammonia	Agrochemicals	Ammonia	Agrochemicals	Ammonia
Environment	Globalization/ WTO accession /market changes/ ecological pressure/ State strategies		Traditional SOE system		Enabler/ catalyzer roles	
	Strong State support/ A growth market for high quality products	Oversupply market / Restructuring process / Decline market of ammonia fertilizer	Transitional character of the SOE reform-gaps between the new and traditional management styles	Oversupply market / Obsolete technology / Old product	Integrated complementary actors/ obtaining political and economic supports from State authorities	Centralized the marketing functions/ Coordinating members' activities to the external relations
Actors	SOIE actors operating in the same SOE system				More attention on assets/ technical synergies, less on human elements	Coordinating relationships/ business operations
	The provincial industrial administrator as broker	The local industrial group as broker	Past relationship /trust problems between the key management team members	Internal competition between the NW participants		
Objectives	Actors - growth opportunity, product quality, market share		Gaps between the individual members' interests and the corporate objectives	Gaps between the objectives, the market and the traditional structure	The broker failed to manage the individual actors' commitment to the NW objective	The broker is in process of carrying out further restructuring initiatives
	Establishing a strategic position of research/product-ion/marketing strength	Restructure strategy/ Centralizing marketing activities of the six plants				
Resources	Availability of complementary resources combination bases fitting to the need of the overall strategy	Utilization of existing resource by sharing marketing information, training	Ineffective utilization of the resource advantages	Maximum utilization of the existing resources / Redundancy resources structure	Ineffective combination of resources due to relationship problems/ competitive behavior	Proactive coordinating efforts of the relationships between the participants
Activities/ Relationships	Complementary combination of activities	Similarity combination of activities	Tight relationship and vertical management process	Redundant activities Internal competition	Complementary activities but non-complementary relationships	Further restructuring /diversifying to new fields
Roles/ Behavior	Redistributed the actor's roles in order to achieve the strategic position	Centralized marketing roles as a step of realizing strategic objective	Relationship problems between members/ Non cooperation behaviors/ Power struggle	Internal competition on marketing roles Coexistence of cooperative / competitive activities / behaviors	Creator /formation phase Lead operator/ development phase	
					Task orientation, impersonal approach Disregard ed the partners' relationship problems during formation phase Failed handling competitive behaviors during the development phase	SOE influence at the Corporate level Marketing center's personal approach and relationship orientation

5.2.3.1 The Environment Aspects and the Research Questions

Most of the external environmental factors analyzed in section 4.2 influenced the formation of the Agrochemicals and Ammonia NWs; and in many cases these factors even overlapped. The INWs had obsolete technology problems and low quality product; while producing and operating in an **oversupplied market**, as presented in sections 3.3.2.3.2.1 and 4.2.2.1. As a result, on one hand, too many plants produced too similar products in small batches to generate the needed return necessary to properly maintain the facilities and develop new technology. On the other hand, the **favorable economic conditions** of the national economy and **China's agriculture development** - presented in section 2.4.4.1 - pressured the agrochemicals and fertilizer manufacturers because of the increasing market demand for high quality agrochemicals and fertilizers which were more progressively supplied by the large multinational firms. Therefore, **improving SOEs' competitiveness** in product quality, technological development, and management became one of the top priorities of the State industrial administrators. The formation of the Agrochemicals NW in connection to the South Pesticide Syntheses Research Center consisted of a **growth strategy**, in the restructuring process of the Ammonia NW, and a **phase-out strategy** represented the initiatives of revitalizing the enterprises as presented in section 4.4 and the case descriptions (see Appendix I, 5-6 and 6-6).

The environmental links to the unsatisfactory outcomes of the two INWs, as indicated in section 4.9, included previously mentioned factors derived directly and indirectly from the globalization process, deregulation, and market challenges. In addition, the **"transitional gaps"** of conceptions and practices between the traditional and new management styles of the managers had caused the most direct consequences to the organizations. In the context of the two INWs, such gaps were mainly manifested from **the managerial and leadership styles** of the managers, as presented in sections 4.6, 4.7, 4.8, and 4.9.

Section 4.6.1.3 and the case descriptions (see Appendix I, 5-6 and 6-6) reflected the brokers' roles, in relation to external environmental aspects and in terms of their obtaining the State's **political and economic supports** in the creation of the respective INWs. The State broker, with strong support from the central and local authorities, complementarily integrated three pesticide producers and one pesticide researcher into a strategic position. Similarly, but with a much lower profile, the SOIE broker (with the support of the local authorities) strategically formed a marketing NW organization instead of creating a fully integrated group, with all the **redundant assets** of the six fertilizer producers located in different counties.

5.2.3.2 The Actors Aspects and Research Questions

Section 4.2.2.1 introduced that nearly all of the actors belonging to the INWs were **SOIE actors** who were technologically outdated and severely pressured by the new competition's rapid technological development. The formation of the two NW organizations, as shown in sections 4.6 and 4.7, were **strategically decided by** the respective **parent organizations**. Under such circumstances, the participants merely followed the decisions. Section 4.3.3.1 summarized some common characteristics of the nine SOIE actors from the two INWs, in terms of their organization structure, industrial activities, decision-making processes, and operational environment etc. From the actors' perspective, these actor attributes were more relevant to the building

process of the Ammonia NW, which was negatively impacted by its weak **internal conditions** and the **external problems** because of the oversupplied market. However, in the Agrochemicals NW (as presented in sections 4.6, 4.7, and the case descriptions) despite the availability of all the favorable conditions, failed during the development phase because of the **internal relationship problems** between the key managers.

The different strategic emphasis put forward by the State broker and the SOIE broker impacted the two INWs' building processes and their outcomes. As analyzed in sections 4.6 and 4.7, the formations of the Agrochemicals NW were more centered on the **"hardware aspect"** of the production assets and technical synergies rather than the **"software aspect"** of the **actors' relationship**. Consequently, the relationship problems between the key managers caused the NW's failure. Contrary to the Agrochemicals NW, one of the specific purposes of the SOIE broker in creating the Ammonia NW was to **coordinate relationships** between the six NW members who were competing each other. Furthermore, the survey results showed that considerable efforts were spent by the Marketing center in developing relationships between the NW participants. This, to a great extent, contributed to the Ammonia NW's survival.

5.2.3.3 The Objective Aspects and Research Questions

The objectives of the actors in forming the Agrochemicals and the Ammonia NWs, as outlined in Table 36 of section 4.4.4.3, satisfied the common interests of the actors at organizational levels. Since the two INWs were **command-initiated** NW organizations, the individual actors had no choice but to follow the overall strategic objectives set by the corporate brokers.

To achieve the objective of responding to the opportunities and challenges presented in sections 3.3.2.3.2.1 and 4.2.2.1, establishing a standardized **research, production, and marketing position** was an important strategic step of the State broker. However, the integration process of the Agrochemicals NW was negatively perceived by the key individual managers as a consequence of their concern over **loosing power** after joining the new group, and this coupled with past relationship problems between the other NW colleagues - as presented in the case description (see Appendix I, 6-6). The State broker in this case, **disregarded** the potential conflicts existing between the key managers. He neither effectively managed **team-building** work among the partners nor acted resolutely to **remove the bottlenecks** of the troubled relationships during the NW formation process. Consequently, he failed to bring about a **congruent commitment to the overall strategic objectives** from the key managers.

The SOIE broker's objective in forming the Ammonia NW was to **(strategically) to implement the restructuring strategy** and **(operationally) to centralize the marketing activities** of the six plants - as explained in section 4.4.4.3 and the case descriptions. The objectives presented in section 4.3, as compared to the NW's outcomes in section 4.9, reflected a mixed picture of a good result from the restructuring process at the corporate level, but also remaining problematic situation at the plants' level. This situation was mainly due to the existence of **gaps between the objectives, the market, and the traditional structure** of the Ammonia NW. Section 4.7.3.3.3 indicated that further reform by introducing a **diverse ownership shareholding system** would allow the individual managers to take stakes in the organization - therefore, taking innovative initiatives in **revitalizing the enterprises**, which was the overall objective of the SOIE broker.

5.2.3.4 The Activities and Relationship Aspects and the Research Questions

Section 4.6.1.3 underlined that **formally combining actors' activities** was one of the main characteristics of the State broker and the SOIE broker in creating the respective INWs. By combining the activities of the different pesticide producers and a researcher into the Agrochemicals NW, the State broker created **a strategic position** consisting of research, production, and marketing strengths, along with a **comprehensive and complementary product line** which covered the major pesticide varieties in the industry.

The **combination of similar marketing activities** in the Ammonia NW was advantageous in terms of **marketing coordination, cost reduction, and sharing important resources** among the six partners. However, the model has limitations in dealing with the problems of the oversupplied fertilizer market and technology obsolescence, as pointed out in section 4.8.2.

Section 4.8.2 interpreted the different degrees of integration of the two INWs. In the Agrochemicals NW, the actors' original activities were **completely** integrated within a **traditional organizational structure**. In order to retain their previous autonomy and power status, the key managers in the Agrochemicals NW resisted corporate control by taking on **power struggle** and **conflict** activities which, consequently, became the main cause of the NW organization's failure. While the Ammonia NW the actors' original activities were **partially** integrated (excepting the marketing activities) the rest of the business operation remained in the hand of each plant. The participants in the Ammonia NW had more autonomy in their business activities than the actors had in the Agrochemicals NW. Moreover, the relationships between the NW partners and the broker were more regulated by the **market** elements than by the **control** mechanisms, as was the case in the Agrochemicals NW.

Sections 4.6, 4.7 and case descriptions (see Appendix I, 5-6 and 6-6) presented that the State broker and the SOIE broker both played key roles in forming the respective INWs in terms of **determining** and **combining** the partners' activities with **formal relational arrangements**.

When combining the activities of the four participants in the Agrochemicals NW, the State broker, paid less attention to the **interpersonal relationship aspects** between the partners than the **asset aspects**. Consequently, the hidden problems of relationships became open power struggle games. This was caused by the State broker's failure to combine the actors' activities with **a complementary relationship arrangement**.

Section 4.7.3.1.3 presented the SOIE broker's justification for combining the actors' activities in the Ammonia NW through standardizing their marketing behaviors and reducing internal competition. It also pointed out that by simply integrating the operations of the six firms into one marketing platform, *without* resolving the fundamental issues of **redundancy** created by **combining similar activities**, and continuing to practice the same **SOE system** caused internal competition between the partners in the Ammonia NW. With further implementation of the **restructuring strategy** (more plant closures), diversifying into **new business fields** - as presented in the case description (see Appendix I, 6-6) - and reforming **the ownership structure** (as anticipated in section 4.7.3.3.3) this situation can possibly be improved.

5.2.3.5 Resource Aspects and the Research Questions

Data presented in the case descriptions (see Appendix I, 5-6 and 6-6) showed that one of the primary reasons for the decision to establish the South Pesticide Synthesis Research Center in Shanghai by the State industrial administrators was because of the **complementary resource structure** between the three pesticide manufacturers and pesticide researcher - while the decision to form the Ammonia NW in relation to resource made more for a better utilization of the **existing resources** through a centralized marketing platform NW organization.

Section 4.8.2 explained that resource allocation to the two INWs varied according to the **strategic priority setting** by the State industrial administrators. Specifically, in order to form the Agrochemicals NW, **strong support** of various types of resources was provided by the central and local Government departments, as presented in section 4.6 and the case descriptions.

In terms of resource conditions, the actors in the Ammonia NW were in many aspects **inferior to** the actors in the Agrochemicals NW. The benefits of forming the Ammonia NW in relation to resources were that through the broker's organization, the six partners could share **market information** and **experience** while receiving **training at lower cost**, as was shown in section 4.6 and 4.7. Along with this, the broker also obtained some financial support and favorable treatments for the NW members from the local authorities.

The outcomes of the INWs, as measured in section 4.9, showed very different pictures in relation to the resource structures of the two INWs. On one hand, **the availability of strong resources** alone did not bring a matching result to the Agrochemicals NW – was as expected by the State broker. The NW failed, for the most part, because of the **actors' behaviors** rather than the resource shortage. While on the other hand the Ammonia NW, with its all-around **weak resource conditions**, operated in an extremely difficult market environment. It did survive, however, due to the broker's **proactive coordinating efforts** between the various internal and external relationships. The INW cases showed that availability of a strong resource base alone could not make the NW building process a success if the other elements (as discussed throughout this dissertation) were ineffectively managed.

5.2.3.6 The Roles and Behavior Aspects and the Research Questions

Sections 4.7.1.2 and 4.7.2.1.3 presented the background links of the roles and behaviors of the participants and the brokers to the formation of the Agrochemicals and Ammonia NWs.

The State broker's objective in establishing the strategic position required that the resources and the activities of the three SOIE and SORI actor be combined into a centralized corporate system and, accordingly, the roles of the actors were to be **redistributed** within a newly defined organizational structure. Consequently, the formation of the NW **changed the relationships** between each partner organization from their previous relatively independent positions and individual power bases into a centralized structure. Moreover, the key managers had to operate within a **tightly coupled relationship system** with individuals who had past problems, as was described in the case description. The broker's inability to handle the relationship

problems allowed the further development of **competitive behaviors** between some of the key managers, causing damages to the NW organization during its development phase.

In the Ammonia NW case, the SOIE broker, in order to realize his strategic objective, combined the **partial resources and activities** of the six fertilizer producers into a marketing platform organization - therefore, **centralizing the marketing roles** of the NW participants. The coordinated marketing operation functioned successfully during the initial stage but, however, could not effectively stop the reemergence **internal competitive behaviors** between the participants due to the problem of activity and resource redundancies of the members, together with the oversupplied market.

Concerning the brokers' roles in the INWs, section 4.7.3.1.3 and the previous sections explained that both the State broker and the SOIE broker **implemented** the strategic decisions made by the superior organizations. The tasks of **creator**, played by both brokers, were more characterized by vertical **decision making** and **top down integration process** than the normal bargaining, negotiation or compromising process as explained in section 4.6.1.3. Other important roles performed by the two brokers during the formation phase included roles as **enabler** and **catalyzer** - in terms of lobbying State financial and political supports for the respective NWs.

Section 4.7.3.2.3 presented that during the development phase of the NWs' building process, the State broker and the SOIE broker all played the roles of **lead operators**, which were characterized by **coordinating** the relationship and activities between the NW participants and various stakeholders.

Section 4.7.3.2.3, by presenting the different management styles of the two brokers, reflected the characteristics of **the SOE influence** with regard to their leadership, conflict resolution, and communication in managing NW s' evolutionary process, politics and information processing.

By holistically analyzing the survey results, this section concludes that the external factors, as shown in sections 4.7.2 and 4.7.3 had great impacts upon the behaviors of the participants in the two NWs, especially in the Ammonia NW case. However, these external factors were not the causes of the different outcomes of each NW in and of themselves. The more direct causal factors that affected the NWs' outcomes were, in fact, **the behavioral patterns of the NW participants** - and in particular, **the brokers' behavior** in managing the relationship aspects between the NW participants in their respective NWs.

Furthermore, throughout the investigation process of the Agrochemicals NW, the **relationship problem** was repeatedly found as the primary causal factor for its failure - directly linked to the ineffective roles played by the broker. In regard to the relationship problems in the Agrochemicals NW, the State broker should have considered selecting managers who **had no previous** (negative) **ties** to be in the NW's management team from the outset of the NW formation - and perhaps more importantly, to have **an outside actor or an independent broker** to perform the role of the lead operator.

5.2.4 Integrated View of the NW Groups

Conclusively, Table 62 puts together the findings from the NW groups into an integrated view.

Table 62: The Integrated View of Each NW's Building Process and the Research Questions

The NW Building Process - Formation and Development phases					Transtage phase
NW	The research questions			Assumptions	
	Factors influencing actors' strategic conduct in forming NWs	Causes of the NW outcomes	The effectiveness of broker's role in building strategic NWs	The NW development	The brokers
The Hybrid Seeds	Growth opportunity of seeds business	Favorable economic condition /China agriculture development Deregulation –SORIs conducting economic activities Complementary resource/activity combination Flexibility/efficiency of loosely coupled system Technology Competence of individual actors Cooperative behavior due to good personal relationships/ trust among the partners Brokers' effective organizing efforts	The brokers' behavior were characterized by personal oriented management and leadership style - relationship and trust building; handling conflict through consultation, accommodation and compromises; informal/ personal communications	International business development	Bringing in professional brokers to manage NWs' expansion The SORI brokers focus on technical/ functional roles
	Complementary combination of resource/ activity Reducing cost			The relationship arrangement may become tighter coupling systems	
The Honeybee	Opportunity of bee pollination service business			Larger scale domestic business expansion	
The Biofertilizer	Opportunity of Biofertilizer business	Insistence of the tight coupling systems led a time consuming/ costful formation process Traditional SOE influence	The management styles to certain extent, still have some SOE influences	Stabilization Development to new market territory NW expansion	An independent broker could: Have chosen a relative loosely coupled system since he had no motives/interests of integrating other partners Have built trust easier with the NW members than an internally selected broker whose' execution might be influenced by the past ties
	Complementary combination of resources and activities Reducing cost			Possibilities/tendencies of both loose/ tight coupling systems in the Transtage phase	
The Compound fertilizer	Opportunity of mixed compound fertilizer			Stabilization of the NWs' operation during the development phase	
The Ammonia	Phasing out strategy	Oversupplied market Old product Resource shortage Redundant similarity activities	The broker's efforts on coordinating and developing relationships with the NW partners	Further reform of ownership system may change the NW relationship arrangement into a loose coupling system between the partners	The relationship problems caused failure could be avoided had the State broker:
	Strategic decision of the State industrial administrators			Used a relatively loose coupling system to link the NW units Removed individuals who had potential relationship problem/competitive behavior from the formational phase	
The Agrochemicals	Growth strategy	Rigid SOE system Relationship problems/ competitive behaviors between the key management team members	The broker's behavior was task oriented/ impersonal managerial/ leadership style Failed handling conflicts/ competitive behaviors within the management team		Selected a broker from outside to play the role of lead operator

Having presented the links of the important empirical findings between the key variables and the research questions in each NW, next section presents the theoretical links to the research questions.

5.3 THEORETICAL LINKS TO THE RESEARCH QUESTIONS

The theoretical links to the research questions are structured along the process of NWs literature theories and objectives presentation as stated in Chapter 2 with key NW properties analyzed throughout Chapter 4. Section 5.2.1 begins by dealing with the first research question, which concerned the factors that influenced the strategic conduct of agribusiness firms in forming strategic NWs in China.

5.3.1 The Strategic Conduct of the Firms to Form NWs – Implication to the Different Theories

Different theoretical explanations concerning cooperation between firms have been presented in section 2.2. The multiple theoretical presentations provided varied explanations of the basic reasons and rationales of firms forming strategic alliances which are found to be generally applicable to the first research question posed in this dissertation - *Why do firms form strategic NWs in the agribusiness sector in the context of transitional China economy?* The following section summarizes the implications of the empirical findings to each perspective in the theoretical framework presented in Chapter 2.

5.3.1.1 Transaction Cost Perspective

The transaction cost perspective presented in section 2.2.2 was **generally** a concern to all the actors in the NW groups of this study - though in different degrees. Section 3.3.2.3.4 and the case descriptions (see Appendix I) have described the cost dimension of each case that had an impact on the actor's decision of NW formation.

The brokers in the two DNWs, independently conducted field operations at the beginning. However, this experience proved to be costly and inefficient. As a result of cooperating with the local partners, the two brokers avoided incurring high costs in the recruitment of field operators and the coordination of scale field activities.

In the SNWs group, the SODE broker in the Compound fertilizer NW could have tried to integrate all the activities into a vertically controlled structure. However, the costs and risks of integration of various resources, as well as the coordination of different activities, were just too high for a broker whose competence was confined only in the area of distribution of agribusiness products. Forming a NW with the four other actors, who had the desired expertise, effectively minimized cost. In the Biofertilizer NW, by entering into a NW cooperative arrangement with the local influential governmental agent and an agribusiness distributor, the POE broker saved himself from incurring high costs on carrying out the operation on his own.

In the two INWs' cases, the cost factors as direct reasons of NW formation were not so obviously demonstrated as they were in the other two groups. Nevertheless, the decisions in structuring the South Synthesis Research Center within an enterprise, including the Pesticide researcher into the group (integrated a competitive R&D base of new products), and the merger of the existing three manufacturers into a strategic position (avoiding capital intensive investment), all explained the concerns of cost by the central and provincial industrial administrators.

Findings in the DNWs and SNWs showed that, due to the loosely coupled relational arrangement between the partners in a NW setting, the costs are lower than in a tightly

coupled relational arrangements – which, according to literature, normally entail high transaction costs in searching for suitable partners and making legal arrangements.

5.3.1.2 Game Theory Perspective

The game theory perspective presented in section 2.2.4, found a **general high support** in the NW groups of this study. The implications to the theory can be seen from both successful NWs and unsuccessful NWs. Section 4.7.2.1 and the case descriptions (see Appendix I) showed that two types of behaviors existed among the NWs - the cooperative behaviors represented by the actors in the DNW and SNW groups; and competitive behaviors represented by the actors from the two INWs. The consequences caused by these two distinct patterns of behaviors were shown in section 4.9; the actors in the two DNWs and SNWs achieved positive results through good collaboration between the NW participants. The individual actors expressed their appreciation of their interdependent cooperative relationships with other NW participants in achieving the results, which cannot be achieved by one alone.

In the two INWs, the causes of failure of the Agrochemicals NW during its development phase, and the difficult situation the Ammonia fertilizer NW encountered, might be explained, to some extent - by environmental factors such as the limitations of the traditional SOE systems, and the uncertainties created by the transitional economic process etc. However, the **non-cooperative attitude and competitive behaviors among the NW actors clearly harmed the performances of the two INWs.**

5.3.1.3 Resource Dependency and Resource Based View of the Firm Perspective

The resource dependency perspective presented in section 2.2.3 was **strongly echoed** by the findings in the NW groups of this study. According to the survey results of sections 4.2.3, the informants from all NW groups believed that the most preferred form of alliance cooperation in the agribusiness sector is that of the organizations cooperating with complementary resources. Section 4.5 showed that the overwhelming majority of informants expressed their preferences of cooperating with partners who have **“possession of key resources required or the complementary resources.”** In addition, most of the actors in the NW groups placed importance on **knowledge types of resources** such as capabilities of strategic and operational management of enterprise, technological expertise, and marketing talents, as desirable resources.

The actors in the DNW and SNW groups, in order to overcome the hurdle of shortages of desired resources needed for achieving their respective objectives, have formed or participated in NW form cooperation for sharing complementary resources with other partners -

In the Agrochemicals NW, one of the major rationales of integrating the three SOIE actors and a SORI actor into one entity was for a complementary resource combination, and further, to obtain a large fund from the central allocation. In the Ammonia fertilizer NW, as described in section 4.7.3, the broker, by creating the central marketing platform, increased bargaining power order to get access to resources such as technical and marketing information, management training and capital investment for the NW participants.

5.3.1.4 Principal Agency Theory Perspective

The supporting facts to the principle agency perspective presented in section 2.2.1 of this study are mainly demonstrated by **the advantages of the NW structure**. As shown in the section 4.6.1, in conformity with the literature, most of the activities in the NW groups of this research were conducted separately along a value chain operation. Therefore, the cooperative operation was limited to a certain activity or activities between the upstream and downstream partners within the NWs. This however, remained under the coordination of the brokers. With externalized relationships between the partners, the control mechanism for the participant's activities, therefore, function by market forces rather than by the internal hierarch systems which normally entail high costs in corporate **governance** by reinforcing **control systems** and organization **rules**.

The advantages of operating with externalized relationships are particularly evidenced in the DNW and SNW groups of this research. In the two INWs, the relationships are more internally structured than the SNWs and DNWs. In addition, principal agency theory has been found supportive as well to the introduction of the new broker model of to be presented in section 5.4.

5.3.1.5 Network Perspective

The NW perspective introduced in 2.2.5 has a **high explicative power** of the strategic conduct of NW alliance formation - which concerns all of the NWs included in the research. Supportive factors to the theory's explanation of NW formation in this study were shown in several sections. Section 4.2 showed environmental factors - such as China's economic reform, WTO accession, technology development, deregulation and other changes in China's agribusiness sectors' competitive environment. Section 4.4 showed the actor's motives and objectives in responding to the changes in the competitive environment. Since the firms were constrained by their limited capacity as individual companies or traditional two-company alliances, they could not command competitive advantages - as explained by sections 4.5 and 4.6. Therefore, by forming a NW alliance, specialists in each field were allowed to cooperate, and exploit new opportunities much faster than if each were to try to acquire the industry-specific skills and assets of others. The same section showed how the firm's strategic conduct in forming NWs was impacted by the relationship between the different NW participants. This mainly included trust-building factors such as cultural fitting, past cooperation experience, knowledge about the partners, personal relations, and flexible relational arrangements.

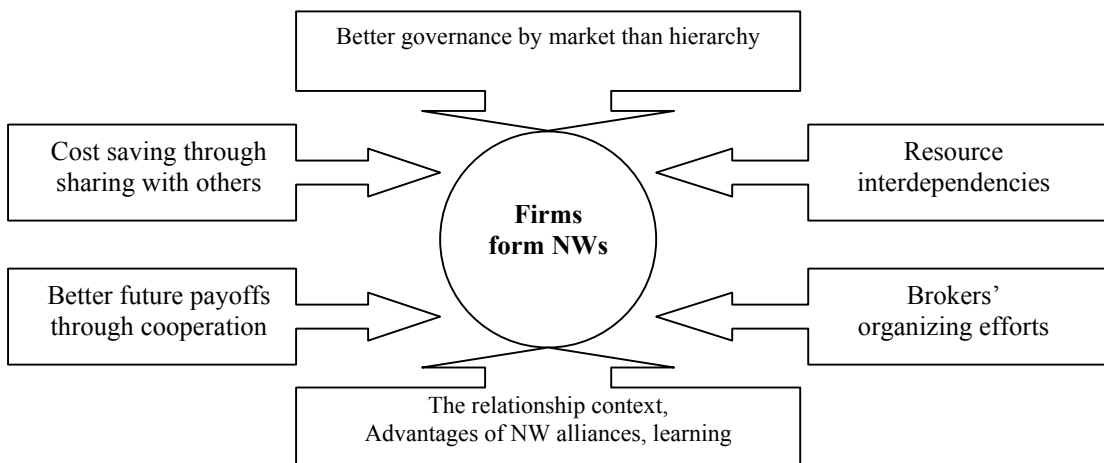
Sections 4.2, 4.4.1, 4.4.2, 4.4.4 and 4.5.1.2 showed that due to managing industrial and commercial operational inexperience, most of the SORI actors regarded their NW participation as an opportunity to *learn* from their business partners.

Finally, the findings of section 4.7.3 strongly supported the theory's hypothesis concerning recruitment patterns which result from different organizing efforts to create a NW alliance - the broker roles and behaviors in the NW building process. The empirical findings, which are found supportive to the hypothesis of the NW perspective, are presented in Table 63.

Table 63: Implications to the NW Perspective Concerning Formation of NW Alliances

Main motivations of the individual actors	Major impacting factors to the strategic conduct of the actors	Formation of NWs	Objectives and activities in the NWs
Sections 4.4 Responding to a growth opportunity Improving product quality Gaining market share A step towards diversification/expansion Access financial resources Gaining organizational flexibility through changing ownership structure Decision of the superior/required by the government or state owner	Section 4.2 <u>Environmental dynamics</u> China's economic reform process, WTO accession, technology development, deregulation and other changes in the competitive environment	The Hybrid seeds NW	Section 4.4.4 To jointly develop a new high-tech hybrid wheat seeds business which satisfies the interests of each individual participants
	Section 4.5 <u>Resource interdependencies</u> Constraints of individual firms or traditional two-company alliance	The Honeybee NW	To jointly expand a honeybee pollination services business which satisfies the interests of each individual participants
	Section 4.6 <u>NW strength/advantages</u> Quicker and cheaper exploitation of new opportunities by cooperating between specialists in each field <u>Relationship context</u> Trust building factors of cultural fit, past experience of cooperation, knowledge about the partners, personal relations, flexibility of relational arrangement	The Compound fertilizer NW	To jointly capture a market opportunity of mixed compound fertilizer
		The Biofertilizer NW	To jointly maximize economic returns of bio-fertilizer in the Yichuan apple tree market
	Section 4.7.3 <u>Broker roles</u> Organizing efforts	The Agrochemicals NW	To gain a strategic position by establishing a research based and marketing oriented agrochemical conglomerate
		The Ammonia NW	To centrally coordinate the marketing activities of the six fertilizer producers

Conclusively, the empirical findings, in relation to the strategic conduct of the firms in forming NW alliances, are found to be **generally supportive** to the theoretical framework. This study found out that each firm formed strategic NWs for multiple-reasons. Figure 50 integrates these theoretical explanations presented in section 2.2 to the strategic conduct of the participants in the NW groups in relation to their formation of NW alliances.

Figure 50: Theoretical Explanations of NW Alliances

Having presented the conclusions of the first research question concerning the strategic conduct of the firms in forming NW alliances, the next section will continue elaborating on the conclusions of the theoretical implications to the dissertation's remaining research questions.

5.3.2 Broker's Roles, Strategic Process and Performance of NWs

Measured by both qualitative and quantitative methods, section 4.9 showed different survey results of the NWs' performance. Since multiple reasons and different theoretical perspectives explained the phenomenon of NW alliance formation in the preceding section, there are different causal factors related to the phenomenon of the different NW outcomes during their building process as well. To narrow the focus on the research questions of this dissertation, this section concentrates on the impacts of the brokers' roles and behaviors to the building process and outcome of each NW.

5.3.2.1 Broker's Role and Behavior in the NW Building Process

Table 64 summarizes the comparison of the roles played by the brokers presented in the literature review in section 2.4.3.4, along with the empirical findings of this dissertation.

Table 64: The Broker Roles during the NW Building Process

NW building process	Key decisions and behaviors	Primary roles	
		Literature review	Empirical findings
	Establish business needs	Architect	Creator
	Identify potential members		
	Envision types of legal and organizational arrangement		
	Setting up the NWs and commencing on joint business activities		
	Chose management style		
	Management of the evolutionary process, politics and information processing	Lead operator	Lead operator
	Remove bottlenecks		
	Discipline network members	Caretaker	
	Help the network to learn		
	Continue to delegate		
	Functional roles	-	
	Continue to establish business needs	Caretaker	
	Identify new NW members		
Envision, design and redesign the type of legal and organizational arrangements			
Functional roles			

5.3.2.1.1 Role of the Creator in the NW Formational Phase

Section 4.7.3 showed that during the formation phase the brokers in the NW groups of this research actually executed the tasks which **combined the architects' and some of the lead operator's** roles - as described in the literature in section 2.4.3.4.2. That is to say, the brokers in the NW groups carried out tasks of a **complete NW creation process** - ranging from establishing business needs, designing strategy and concept, identifying and formally connecting potential members, coordinating formation activities and relationships, setting up the NWs, and, finally, commencing joint business activities. This discrepancy is due to the different ways of defining the NW developmental phases in relationship to the roles played by the brokers during the NW life cycle in the literature. Consequently, the brokers in the NW groups of this research during the formational phase would be more appropriately referred to as a **"creator"** rather than an **"architect,"** whose role is merely part of the process of a NW creation. Table 65 below illustrates the differences of the key decisions and behaviors between the creator and the architect during the formational phase based on the survey results presented in section 4.7.3.1.

Table 65: The broker's Roles during the Formation Phase of the NW Building Process

Primary role - Architect	Primary role - Creator
Formation phase	
Key decisions and behavior	
Literature review	Empirical findings
1. Establish business needs 2. Identify potential members 3. Envision type of legal and organizational Arrangement	1. Established business needs 2. Identified potential NW members 3. Envisioned, designing <i>and redesign</i> type of legal and organizational arrangements - and 4. <i>Setting up the NWs and commencing on joint business activities (Formally connect specific firms together into an operating network)</i>

Along the key roles of the creator played in each NW during the formational phase as illustrated in Table 65, the impacts of these roles on the building process and performances of each NW will be summarized in the succeeding sections.

5.3.2.1.1.1 Establishing Business Need

Sections 4.7.3.1.1 and 4.7.3.1.2 showed that the brokers in the NW groups, as principally described by the literature presented in section 2.4.3.4.1, initiated the NW creation processes by first establishing the business needs, then articulating and demonstrating the business vision and advantages of joining the NWs to the different actors. These experiences, as presented in sections 4.6.1.1.1, 4.6.1.2.1, 4.6.1.3.1 and 4.7.3.1 were found to **match** the roles of the differently architect described by Snow, Miles and Coleman (1992).

Nevertheless, the brokers in the two INWs carried out the processes of business need establishment differently. Section 4.7.3.1.3 showed that the central and local industrial administrators strategically established business needs for forming the Agrochemicals and Ammonia NWs. The creators' roles were mainly to implement the strategic decisions made by the State authorities. The organizing efforts of the State broker and the SOIE broker involved no potential participant consultation. Unlike the DNWs and SNWs, the formations of the two INWs resulted from the superiors' administrative directives rather than the **participants' own decisions**, motivated by the business needs. Consequently, the participants from the DNWs and SNWs have stronger **commitments** than the members from the INWs have to their particular NW objectives.

5.3.2.1.1.2 Identifying Potential Members

Diversions in consistency from the literature in sections 2.4.3.4.1.4, 4.6.1.1.1, 4.6.1.2.1 and 4.6.1.3.1 showed that the creators of all NWs, except for the Biofertilizer NW, did not spend much effort in searching new partners. This can be explained by the characteristics of NW evolution, of the past knowledge of partners, or the existence of long relationships between the brokers and their partners. The brokers' strategic decisions in forming alliances with their respective partners were largely influenced by the factors of good relationship and business complementarities between them. By identifying and putting together **partners with the right**

‘chemistry’ into NWs from the outset of the formation phase, the brokers of DNWs and SNWs have, therefore, laid down solid foundations for the future NW cooperation.

Sections 4.6.1.3.1, 4.7.3.2.3 and the case descriptions (see Appendix I, 5-6 and 6-6) presented that the State broker and the SOIE broker had integrated the internal units into NW form organizations with SOE systems. This was done, however, without resolving the fundamental issues of the competitive elements and conflicting relationships between the potential members. Those issues then became the causal factors to the outcomes of the two NWs during the later development phase. The literature relevant to this particular aspect was presented in section 2.4.3.4.1.5.

5.3.2.1.1.3 Designing Cooperative Arrangement and Setting Up NWs

The formal and informal aspects of the NW groups treated in section 4.6.3.1 showed that the brokers of each NW had designed different legal and organizational arrangements by which the NW members were linked and, accordingly, their activities and resources were combined as illustrated in Figure 31 and Table 43. Section 4.6.3.2 showed differently coupled relationship patterns between the members within each NW configuration as designed by the brokers. The findings concerning the prescribed and emergent NWs in this dissertation **corroborate** to the characteristics of the two types of NWs presented by the literature review in section 2.3.2.1. Specifically, the State brokers and the SOIE broker formally prescribed the two INWs with high visibility within and outside the cooperating firms. The brokers of the Hybrid seeds, Honeybee and Biofertilizer NWs and, to some extent, the Compound fertilizer NW²⁶, adopted relatively informal NW models based on the **trust and relationship between the participants** which then developed through business exchanges and evolved as the consequence of growing awareness of mutual interests. Table 66 illustrates an overview of the organizational configurations of each NW as designed by the individual brokers.

Table 66: The NW Organizational Configurations Designed by the Brokers

NWs	Types of NWs	Relationships	Actors	Combination of activities	Combination of resources			
The Ammonia NW	Prescribed	Tightly coupled by written contracts and corporate rules	Same ownership and business fields	Similarity of combined activities	Similarity of combined resources			
The Agrochemicals NW				Complementarity of combined activities	Complementar ity of combined resources			
The Compound fertilizer NW	Prescribed and emergent	Loosely and tightly coupled by written contracts and agreements	Divergent ownership and business fields					
The Biofertilizer NW	Emergent	Loosely coupled by written and oral agreements						
The Hybrid seeds NW								
The Honeybee NW								

The key managers from the Agrochemicals NW were of a strong opinion that the enforcement of a tightly coupled relationship between the partners characterized a typical SOE style which hindered the NW from achieving congruent management

²⁶ The relationships of the two SORI actors and the Agro-tech center in the Compound fertilizer NW were less formally arranged compared to the Fertilizer producer.

actions and expected performance - particularly at the time of transitional economic processes where various relationship arrangements were pursued by many industrial actors.

The Hybrid seeds, Honeybee, and the Biofertilizer NWs were characterized by their **loosely coupled relationships** between partners with complementary resources and activities and objectives on the domain along the value chains. This system allowed members to interactively accomplish the differentiated tasks relevant to the overall NW objective while still **maintaining their independent legal entities and autonomous status**. More importantly, as a result of using the flexible cooperative structures characterized by the loosely coupled relationship arrangements, the actors from the two DNWs and the Biofertilizer NW - in contrast to the Compound fertilizer NW - avoided particular legal process and bureaucratic formalities therefore, saved **costs**.

The following section presents the findings concerning the distribution of power and influence in the group of NWs according to their different results.

5.3.2.1.1.4 Power and Influence of Brokers in the NWs

Both empirical data obtained from the key NW informant interviews and theoretical measures in section 4.6.3.3 concluded that, in the context of the NW groups of this research, **brokers are the most central actors** within the boundaries of each NW due to their key resources control or command positions. This centrality within the NWs enables the brokers to enjoy a position consisting of power (degree), efficiency or independence (closeness) and controlling or increasing dependency of the NW members (betweenness) as was introduced by the literature in section 2.4.3.2.2. However, when dealing with the system-wide properties of the NW or the extended NW relations, as the centrality of the NW members increase so does the dependency of the brokers on them.

The brokers in the DNWs and SNWs effectively handled the interdependency and mutual reliance dynamic relationships, thus enhancing personal relationships and trust with their NW members. In return, the NW members supported the central leadership of the brokers. The unanimous consent of the central positions of the Seeds broker in the Hybrid seeds NW and the SODE broker in the Compound fertilizer NW during both formation and development phases (as responded to by the NW members) showed that in addition to their central position within the two NWs, the two brokers also **had direct access to the secondary contacts**. These direct accesses to the key secondary contacts by the SODE broker and the Seeds broker strengthened their centrality position, despite the relative high closeness and betweenness centralities of other NW members.

In the two INWs, the brokers' centrality were characterized by their command power - facilitated by the SOE systems emphasizing less on relationship and trust building with the NW members than on the vertical control of members activities. As a result, the members of the two INWs, and the Agrochemicals NW in particular, attempted to avoid being controlled by their corporate superiors by adopting non-cooperative attitudes toward each other and engaging in competitive activities amongst themselves.

Concerning the “structural hole” (presented in section 2.4.3.2.2.2) section 4.6.3.4.1 showed that by forming cooperation with partners of **maximum nonredundancy primary contacts** and **diversified resources and competences**, the Seeds broker, the Bee broker, the SODE broker and the POE broker had the largest volume of structural holes between their contacts functioning as ports of access to a great number of clusters of secondary contacts. Therefore, the actors, and, in particular, the four brokers enjoyed more NW benefits such as information, opportunities, and awareness of impending disasters. As the NWs continue to develop, the brokers will have to identify and fill up new structural holes in order to meet the needs of new opportunities and challenges.

Contrary to the situation of DNWs and SNWs, the contact clusters in the Ammonia NW were almost **completely redundant at both primary and secondary levels**. And, consequently, given the NW poor structural holes, the NW had little benefits.

Table 67 summarizes the impacts of the brokers’ roles and behaviors on the NW performance during the formation phase. Following that, section 5.3.2.1.2 will continue to introduce conclusions based on the research question results by focusing on the NW’s outcomes in relation to the lead operator’s roles and behaviors during the NW Developmental and Transtage Phases.

Table 67: Summary of Conclusions to the Research Question (formation phase)

The brokers’ key decisions and behaviors and their implications to the NW’s outcomes during the formation phase				
Theoretical framework	The Hybrid seeds, Honeybee and Biofertilizer NWs	The Compound fertilizer NW	The Ammonia NW	The Agrochemicals NW
Establish business needs	Members were convinced to join NWs by well established and articulated business visions Created business driven commitments from the participants		The NWs creation processes were driven by directives rather than by articulating the business needs to members	
Identify potential participants	Identifying /putting together the partners with the right ‘chemistry’ into NWs from the outset of formation phase- thus ensuring sound and complementary cooperative bases between the NW participants		Integrated internal units with unsolved conflicting relationships Continued the SOE systems	
			The NW actors have similarity of activities and resources and competing in a same market	Neglected potential relationship damaging problems between the key managers
Design of cooperative arrangement and setting up NWs	Designed cooperative arrangements accommodative to the actors with shared goals and complementary resources and activities combination		Enforcement of a tightly coupled relationship between the partners characterized by the SOE bureaucratic styles The structure were lack of incentives to innovation	
	Used loose coupling systems	Used a relatively tight coupling system		

5.3.2.1.2 Role of the Lead Operator in the NW Developmental and Transtage Phases

The empirical findings in section 4.7.3.2 confirmed the theory presented in sections 2.4.3.4.3 and 2.4.3.4.4. As each NW moved into the operational stage, most of the brokers’ tasks emphasized managing internal and external relations, coordinating member’s activities, implementing the strategies and developing new business - as well as the design of problem solving and decision processes as described in the literature. During this phase, the brokers played **coaching and enabling** roles of

‘caretaker’ in the testing phase as defined in the literature. The brokers of the DNWs and SNWs also performed **functional roles** as other NW members on **the specific domains of the value chains** in each NW.

The following sections will continue introducing conclusions to the second research question along the themes of development of personal relationship and trust, management style, management of the NW’s evolutionary process, as well as the handling of NW politics and information processing.

5.3.2.1.2.1 Development of Culture, Personal Relationship and Trust

The importance of culture, personal relationship and trust (as presented by the literature in sections 2.4.3.3.2 and 2.4.3.3.3) are strongly supported by the findings shown in sections 4.6.1.1.2, 4.6.1.2.2 and 4.6.1.3.2. The brokers from all NWs in this study commonly experienced that **coordinating relationships** among the partners and other stakeholders were the most important tasks for them to execute when the NWs entered into the development phase. Further, section 4.7.2.2 showed that among other factors, the NW participants viewed **trusting relationships among partners** as the most important factor to success. The findings confirmed the broker’s efforts in developing relationship and trust with, and among the NW participants, which have a direct impact on the success of NW building process - particularly when taking into consideration the multifaceted and cross-functional characteristics of the actors and relationships in most of the NWs of this research as shown in sections 4.3, 4.4 and 4.5.

1) Cultural aspects

Section 4.3 presented that all actors selected in this study operated within the same industrial, social, political, economical and cultural environment. The differences of culture were mainly institutional or professional differences. Section 4.7.2.2 showed that cultural difference among the partners played an insignificant role during the formation stage. According to the literature, cultural differences are not fully evident at the stage of alliance formation, but they become more apparent as the NWs start operating. Another finding according to the Seeds broker was that the **loosely coupled relationship** between the cooperative partners, to some extent, **also reduced the exposure of potential cultural conflict**. The Pesticide distributor confirmed that **personal relations** play a role of narrowing down the cultural gap with the Government agent partner in the Biofertilizer NW. Despite little impact to the NWs’ outcomes resulted by the cultural differences at this stage, the majority of the brokers interviewed demonstrated awareness of the importance of this particular variable in relation to the future relationships between the participants.

2) Personal relationship and trust

Section 4.6.3.1.2 showed that the actors who had invested in the relationship with each other and developed trust during the process of their previous social and business exchanges contributed to the successful creations of the DNWs and SNWs. According to the findings in section 4.7.2.2.1, personal relationships and trust between the partners **during the development phase are more important than they were during the formation phase...** Sections 4.7.2.1 and 4.7.2.2 demonstrated that the effective coordination of various relationships by the brokers have resulted in efficient joint operations between several members in differentiated technical process and geographical locations in the two DNWs and close collaborations between the upstream and downstream partners in the two SNWs. The brokers’ initiatives

concerning this particular aspect included increasing overall operation transparency, to strengthening confidence and trust among partners, and encouraging personal contacts between the individuals in both business and social occasions. The brokers in the DNWs and SNWs groups made special efforts in enhancing relationship and trust building **at both organizational and individual levels**.

Section 4.7.2.1.3, 4.7.2.2.3 and the case description (see Appendix I, 6-6) described the State broker's failure in handling the problems of relationship and trust among (and with) the key management team members, thus allowing the development of unconstructive relationships and small coalitions between the partners – and these, in turn, caused eventual damages to the Agrochemicals NW. Contrastively, section 4.7.2.2.1.3, explained the efforts of the GM of the Ammonia NW to develop personal relationship and trust with the members, which helped maintain a momentum of the NW's business operation through a rather difficult condition.

The findings have strongly confirmed that the brokers' different ways of handling personal relationships and trust have great impact on the behavioral patterns of NW members and, therefore, on the different outcomes of the NW organizations.

5.3.2.1.2.2 Management Style

Section 4.7.3.2 and the corresponding case descriptions (see Appendix I) showed findings concerning the managerial style of each broker – conforming to the literature review in section 2.4.3.4.3 - that as a NW moves into the development phase, the broker has to pay particular attention to the choice of **managerial style**, with regard to leadership, communication, conflict resolution and management of politics, information processing and evolutionary processes.

1) Leadership style

Both qualitative and quantitative results presented from section 4.7.3.2 and the corresponding case descriptions attached in Appendix I demonstrated that brokers in the DNWs and the SNWs had leadership styles characterized by **people orientation** and the active encouragement of sound cooperative relationships between the partners at both organizational and individual levels - as presented in the sections 4.6.3.1.2 and 4.7.2.2. The same results from section 4.7.3.2 and the case descriptions (see Appendix I, 5-6 and 6-6) showed **a leadership style of task orientation and an autocratic approach** of the lead operator in the Agrochemicals NW. The SOIE broker in the Ammonia fertilizer NW has a leadership style emphasized on hierarchical operational process typified by the influence of the traditional SOE systems (at the operational level, some relationship orientation).

2) Conflict management

Sections 4.7.3.2.1 and 4.7.3.2.2 showed that in the DNWs and SNWs, disagreements among the participants were resolved through **consultation, compromise and accommodation**. However, according to the survey results in section 4.7.3.2.3 disagreements between the members in the two INWs were normally resolved through **executive orders**.

3) Communication

Findings in sections 4.7.3.2.1 and 4.7.3.2.2 showed that effective communication patterns have impacted each NWs' results. This was demonstrated by the DNW

brokers' organizing various gathering activities and frequent **informal** meetings between the members of the Compound fertilizer NW, as well as the Biofertilizer NWs managers' regular **personal** visits to partners. In contrast, section 4.7.3.2.3 showed that in the Agrochemicals NW communication was more **formal and impersonally** conducted. While in the Ammonia fertilizer NW, at the operational level, the Marketing center maintained direct **personal contacts** with the NW members and some of the partners were also in contact to each other outside the NW.

4) Management of Politics, Information Processing and Evolutionary Process

With regard to the literature presented in section 2.4.3.4.1.5, although no particular political problems were found in the DNWs and SNWs groups at the time of investigation, sections 4.7.3.2.1 and 4.7.3.2.2 showed that the brokers, however, fully recognized the sensible nature of the "*dual allegiance*" that each partner had and took into account both individual member interests and collective NW interests. The high degree of satisfaction at both organizational and individual levels demonstrated in section 4.9.1 proved the fact that the brokers of the DNWs and SNWs had effectively managed the developmental processes by emphasizing **the balanced achievements of the individual members and the NWs as a whole**.

Section 4.7.3.2.1 showed that in the area of information processing, the Seeds broker and the Bee broker frequently organized meeting and exchange activities between the NW partners, distributed information materials, and provided training courses and field demonstrations. Section 4.7.3.2.2 showed that POE broker paid frequent visits to partners and exchanged information with them on a regular basis. Sections 4.7.3.2.1 and 4.7.3.2.2 concluded that all participants from the DNWs and SNWs felt satisfied with regard to the **opportunity to express relationships, decision processes, obligations to the written rules and procedures, and informal interactions and exchange of ideas** between the NW participants. The survey results also indicated that the lead operators provided the members of each NW with appropriate and adequate information which were suitable for their information processing capabilities.

Section 4.7.3.2.3 investigated the political problems in the two INWs. As described in section 4.6.1.3.1, 4.6.1.3.2 and the case descriptions (see Appendix I, 5-6 and 6-6), the past relationship contexts between partners in the Agrochemicals NW resulted in uncooperative behaviors and coalitions among the partners during both formational and developmental phases. The broker did not (or was not in a position to) act upon the problems by either effectively enhancing **team building work** among the key individuals, or resolutely **removing the troublemaking elements**. Sections 4.6.1.3.1, 4.6.1.3.2 and the case descriptions also presented the political issue in the Ammonia NW where members competed to each other internally.

In the area of information processing, survey results in section 4.7.3.2.3 showed that all informants interviewed in the Agrochemicals NW complained that other's ideas were **imposed** upon them and that the lead operator provided only **limited** information to the members. Further, in section 4.7.2.1.3, all the participants in the two INWs confirmed that "*written rules and procedure were **not** followed*" in their respective organizations.

According to the literature in section 2.4.3.4.1.5, the lead operator must define a process for managing the NW, which includes proceeding at a pace that is

comfortable to all parties. Findings in section 4.7.3.2 showed that the brokers from all NWs investigated have acknowledged that keeping **an appropriate pace of the development process** to all participants in the NW was a demanding task. Sections 4.7.3.2.1 and 4.7.3.2.2 showed that the participants in both DNWs and SNWs expressed different concerns with respect to the speed of their business proceedings. The lead operators of the Hybrid seeds, Honeybee and Biofertilizer NWs (in particular) **have balanced both short and long-term concerns in the NWs**, and managed the proceedings of the development processes at appropriate paces to all NW participants.

Table 68 summarizes the conclusions to the second research question concerning the impact of brokers' roles and behaviors to the NWs' performances during the development phase.

Table 68: Summary of Conclusions to the Research Question (development phase.)

The brokers' key decisions and behaviors and their implications to the NW's outcomes during the development /transtage phases							
The NW management context		The DNWs		The SNWs		The INWs	
		The Hybrid seeds	The Honeybee	The Biofertilizer	The Compound fertilizer	The Agrochemicals	The Ammonia
Development of personal relationship and trust		Made special efforts in enhancing relationship and trust building at both organizational and individual levels				Mistrust/relations problems between the key managers	Efforts spent in managing the relationship aspects
Management styles	Leadership style	People orientation Emphasized on the sound cooperative relationship between the partners at both organizational and individual levels				Task orientation	
						Autocratic approach	To certain extent used a people-oriented approach
	Conflict management	Disagreements were handled through accommodation, compromise and consultation Personal approach to conflict resolution				Disagreements resolved through <i>executive order</i> by the superiors. Impersonal approach to conflict resolution	
	Communication	Active communication emphasizing on personal contacts in and outside the NWs				Impersonal communication media at corporate broker levels	
Small coalitions						Personal contacts at operational levels	
Management of politics		Balanced the individual members' interests and NWs' as a whole Created healthy relationship patterns				Less emphasis on the individual participants' interests	
Management of information processing		NW participants felt satisfied with regard to opportunity of expressing about relationships, decision process, obligations to the written rules and procedures, informal interactions/exchange of ideas between the NW participants				Members felt that other's ideas imposed upon them Written rules and procedure were not followed Provided only limited information to the NW members	
Managing evolutionary process		Balanced both short and long-term concerns of the NWs as whole Proceeded the NWs' processes at appropriate paces to all participants.				Slow decision making process Members were not motivated in relation to the NW's development	
Centrality and power		Controlled key resources Formed cooperation with partners of maximum nonredundancy primary contacts and diversified resources and competences <i>More</i> NW benefits because of large volume of structural holes				Command power emphasizing on vertical control The clusters of contact are redundant at both primary and secondary levels Poor structural holes/less NW benefits	
Management in different types of NWs		Emphasized long-term success by expanding the NWs to ensure even greater responsiveness (key success factor to DNW)		Ensured the speed and efficiency between upstream and downstream partners (key success factor to SNW)		Corporate intervention in the determination of transaction prices Ineffective utilization of internal assets (key factors of failure to INW)	

5.3.2.1.2.3 Managing Different Types of NWs

Section 4.7.3.3.1 and the case descriptions (see Appendix I, 1-6 and 2-6) showed that the behavior of the brokers of the two DNWs confirmed the literature presented in section 2.4.3.4.1. The Seeds broker searched for capable new partners for the expansion to international market. The Bee broker, as well, intended to use the same NW approach in developing new partners in other provinces of the country.

Section 4.6.1.2.1 and 4.6.1.2.2 verified the theory in section 2.3.1.3.3.4 by emphasizing that an efficient operation is the key to success in a **stable network** - demonstrated by the cooperation between each partner in the Compound fertilizer and Biofertilizer NWs in their formation phases and the initial success achieved in their development stages as well.

As introduced by the literature in section 2.3.1.3.3.4 corporate intervention of resource flows or in the determination of transaction prices is the most common managerial misstep in INWs. Data in the case descriptions (see Appendix I, 5-6 and 6-6) showed that in the Agrochemicals NW, instead of following **the open market practice**, the State broker arranged for the Pesticide researcher to transfer his new technology on a **first refusal condition** to the internal group and then to the outside customers.

A similar situation took place in the Ammonia fertilizer NW as well, since the Market center required its members sell through the internal marketing platform with a **below market price**. Section 4.7.3.2.3 and the case description regarding decision-making and operation process in the Agrochemicals NW (see Appendix I, 6-6) **supported** the literature in this particular respect.

Having presented the conclusions of the theoretical links to each research question, the following section will focus on introducing conclusions to the final research question series of this study – the broker links.

5.4 BROKER LINKS TO THE FUTURE NETWORK DEVELOPMENT

5.4.1 The Effective Performance of Broker

The third research question of this dissertation concerns the aspects of particular behavioral patterns and qualifications of a broker in relation to the standards of tasks he is expected to perform in the NW building process. The conclusions to this particular research question are presented along the findings shown in sections 4.2.3, 4.7.2 and 4.9.3 about the NW participants' views and expectations with regard to the NW alliance cooperation, and the brokers in particular. Finally, on the basis of the relevant conclusions of the empirical and theoretical links to the research questions presented in the preceding sections 5.2 and 5.3, a new model of broker is introduced that, according to the investigation of this study, better fits the contextual elements of the research questions.

5.4.1.1 The Expectations of the NW Participants

Sections 4.2.3 showed that, according to the common preferences expressed by all the top managers interviewed from the NW groups, the most suitable forms of alliance cooperation in the agribusiness sector at China's present economic development stage

are NW organizations formed by partners whose resources and activities are complementarily held-together by a loose coupling system.

This type of cooperation and relationships between the partners were found, most evidently, in the DNWs and SNWs groups in this study. Both literature and empirical findings showed that the strategic building process of NWs with the above characteristics would typically require a broker to have an **integrated capability** in order to perform an effective role in building strategic NWs. According to the survey results obtained from interviewing twenty-eight key executives from the NW groups, as shown in section 4.7.2, an effective NW manager is expected or preferred to be a type of manager who has **strategic vision**, **leadership skills** and **managerial experience**, **professional knowledge** (referring to functional expertise), **communication skills** and **broad social network of relationships**. He is also **capable of coordinating** and **organizing collaborators** with **different cultural backgrounds**. Section 4.9.3 emphasized more on the brokers' **ability of implementing the business strategy**. In addition, the informants also believed that an effective broker should also demonstrate **understanding**, **commitment**, and have a **trustworthy**, **magnanimous** and **broad-minded personality**.

Furthermore, the survey results of section 4.7.4 showed that the informants favored the type of brokers who have the knowledge and professional capacities in strategy design and implementation, along with having access to relevant resources, to large corporate broker types who normally control financial and technical resources. This particular choice of the **knowledge based broker** rather than the **power based broker** reflects the participants' desire for a capable broker who **serves** the interests of the NW as a whole, rather than only prioritizing the big partner's interests. To a considerable extent, it also reflected the participants' concerns about potential **integration** by a strong broker who has all the means to do so.

Section 4.7.2.2 also showed that the NW participants prefer to have the same broker carrying out the strategic and operational tasks all the way through the NW building process. This sort of **consistent management** would allow a broker to accumulate relevant knowledge and experience about the different stages of NW building process while building up longstanding personal relationships with the partners.

This section has summarized findings directly related to the qualifications of a broker in performing an effective role as expected by the NW participants. The up-coming sections will focus on linking these preferences or expectations of the NW participants to an identical pattern and the real business world - in relation to the brokers' capability of building of strategic NWs.

5.4.1.2 The Need for a New Model of NW Brokers

As China's economic reform process continues, more NW form cooperation between enterprises (especially small and medium size enterprises [SMEs]) need to be created for the explicit advantages introduced by the literature, as well as past and present empirical studies demonstrated in this research. Additionally, as concluded by both theoretical and empirical links to the research questions in this study, the development of strategic NWs lies primarily on the organizing efforts of the brokers. The paucity of NW cases in the agribusiness sector, as experienced by the researcher while searching for research sites (as reported in section 3.3.2.3.3), also reflected the fact

that - due to the fact that few organizations play the role of brokers - few NW organizations exist. Therefore, more organizations like the brokers in the NW groups of this study should be encouraged to initiate NW building processes with other complementary enterprises.

The empirical findings of this study confirmed, together with the literature, that all six actors who played brokers' roles in the NW groups are either **core firms** or **lead firms**. These traditional lead firms controlled specific resources and core competences such as technology (the Seeds broker and the Bee broker), product (the POE broker), market channels (the SODE broker) and administrative power (the State broker and the SOIE brokers), making each of them a central player in their respective NWs. However, this lead firm characteristic of the brokers, as identified in the NW groups of this research, evokes the following questions in relation to the development of NW organizations:

1. Since most of the NW formations are initiated by the lead firm brokers, should enterprises, only have a chance to form NW alliances until a relevant core firm or lead firm comes to identify and select them?
2. How many core firms/lead firms can realistically meet the major qualifications as preferred or expected by the NW participants investigated in this research as summarized in section 5.4.1.1?
3. Since the evolutionary relationship process and trust building play an important role in actors' strategic conduct of forming NW organizations, what about the organizations that have not built up ties with other potential partners?
4. Should the preferred form of cooperation and the brokers as expressed by the NW participants interviewed in this research remain as merely wishful thinking? Is there anyway to satisfy these **customer needs**?

This lead firm broker characteristics, as reflected by the above questions are, in fact, limiting the development of strategic NWs in an industrial environment wherein, numerous enterprises (especially SMEs) are likely the major potential users of the strategic NWs. This situation calls for necessary actions to be taken in providing additional instruments to the development of NW organizations in China, with respect to the function of the NW brokers.

As this dissertation has come to a stage where the reasoning behind the creation of NWs and their outcomes have been explained, the process of searching for better ways of building NWs continues to unfold. Consequently, a new type of broker whose role fits better into the dynamic environment of China agribusiness sector is beginning to evolve. The next section will complete the conclusion to the research questions by recommending a new model of broker in relation to the effective building process of strategic NWs in the context defined by the research questions.

5.4.1.3 The Strategic Interactor – A Recommendation

Based on the conclusions of both empirical and theoretical links to the research questions, in relation to the effective role of NW brokers, this section completes introducing conclusions to the final research question by recommending a new model

of broker - the Strategic interactor - as an additional instrument for effectively building strategic NWs in China. To begin with, a brief description on the definition and objectives of the Strategic interactor and some of its basic organizational and operational attributes are given as below:

The Strategic interactor is an independent business institution with multifaceted competencies. It specializes in creating and managing strategic NWs by proactively interacting between the institutions with existing or potential cross-functional relationships in the selected business sectors in China.

Organizationally, the Strategic interactor is structured as an **Industrial Management Company (IMC)**. The Strategic interactor, takes proactive actions in searching, creating, developing and managing strategic NWs. As a knowledge based value creator, the Strategic interactor or the IMC is characterized by a **multifaceted** configuration of different (but specified) types of skills, expertise or competencies represented by groups of industrial managers, and functional specialists who have both **international and domestic experiences** (investment specialists, engineers, designers, marketing, distributing, manufacturing and other specified professionals). Like any specialized organization, the IMC being a highly specialized NW building profession, has its own strategic and operational principles and process. Moreover, the Strategic interactor operates according to the NW organizational pattern to ensure a maximum efficiency and, where appropriate, to cooperate with the external relationships.

Operationwise, the Strategic interactor **proactively** and **purposefully** initiates NW development processes through routine interaction between the clusters of firms with existing or potential cross-functional relationships - searching for opportunities which require **integrated multifunctional solutions** to problems that generate innovative products and services. By performing the **creator's** roles of establishing the business needs, identifying the potential participants, designing the cooperative arrangement, and obtaining the participants' commitments, the Strategic interactor sets up the NWs. He then continues to execute the tasks of the **lead operator** during the NW's development phase, and during the transtage phase, as explained in the previous sections.

To justify the proposed Strategic interactor, or IMC, as an additional instrument for effective NW building in the context of the China's transitional economic process, some arguments concerning the advantages of the model are presented in the following section.

5.4.1.4 The Advantages of the Strategic Interactor

This section aims to provide theoretical and empirical explanations about the advantages of the Strategic interactor, with no intention to prejudice the study results in favor of roles played by the traditional core firm brokers in the NW groups. Both literature review and empirical investigations have demonstrated that the Strategic interactor has two distinct advantages over the traditional core firm or lead firm brokers from the NW groups, with regard to their effectiveness of building strategic NWs: **professionalism** and **independency**. Both are found as having direct links to the **development of trust** - the key factor of strategic alliances, as frequently

emphasized in the literature review in section 2.4.3.3.3 and empirical findings in section 4.7.2.2.

Concerning **professionalism**, first of all, the Strategic interactor is a **new type of organization** characterized as a full time **professional NW builder** with a mission, organizational structure, resource composition and operational principles and process dedicatedly designed for the purpose of NW building activities. Compared to the relatively comprehensive competences²⁷ of the Strategic interactor, the lead firm brokers in the NW groups of this research are specialized in one specific professional domain. Moreover, their management experience is mainly focused on the **internal organizational units** rather than strategically and operationally coordinating the various **external relationships** with different competences. Intuitively, a professional NW builder with purposefully configured multifaceted competencies has a better chance of handling several external NW relationships with multi-professional activities than a **mono-disciplined** core firm or lead firm broker. Some evidences supporting this argument were shown in section 4.7.3.1; the usual business activities such as “*determining a good business opportunity*”, “*establishing business needs*” and “*working out a solid business plan and proposal*” (question 10) were acknowledged as rather difficult tasks by most of the brokers in the NW groups during the interviews.

Second, due to his specialized knowledge about NWs in both theory and practical terms, the Strategic interactor pays specific attention to the operational logics of different types of NWs as shown in section 2.3.2 - therefore, avoiding various common NW errors.

Third, it is also assumed that when the NWs moved into the development phase, the coordinating efforts of a NW mindset professional manager fit more effectively into the relationship context of NW process than the adaptive efforts by a traditional lead firm manager.

Fourth, section 4.7.2.2 also showed that the NW participants preferred to have a same broker carrying out strategic and operational tasks all the way through the NW building process. A dedicated professional IMC can provide a more **consistent management** process to a NW organization than any other NW participants who normally have other core activities (original activities) or commitments in their respective organizations outside the NW.

Fifth, regarding the importance of the evolutionary process of relationship and trust shown in sections 2.4.3.3.3 and 4.6.3.1.2, although the Strategic interactor may not have particular past ties with every potential NW participant, he can **earn their trust** by demonstrating the **reliable quality** of expertise based on his **dedicated mission** and **professionalism**. In this context, the Strategic interactor may build trust easier with the NW members than a traditional core firm or lead firm broker whose' execution might be often biased or influenced by his past ties with the particular NW participants.

Sixth, since the impact of WTO accession becomes increasingly important, as was presented in section 2.4.4, another important contribution to the subject of effective NW building concerns the **international aspects** of the professional NW builder. A professional NW IMC with **cross-cultural expertise** can provide confidence to the foreign firms in forming NW cooperation with the local partners in addition to the joint venture or other formal arrangements that most of the foreign companies costly,

²⁷ The Strategic interactor is formed by the executives with different professional expertise and experiences which correspond to the various activities of a particular NW.

used so far. Furthermore, many small and medium size enterprises in China and abroad have difficulties doing business in foreign markets mainly because of their weak capabilities in terms of international business experience, strategic and operational management and other resource constraints. The SMEs are not only concerned about the activities and resources involved in forming the alliances, but are also worried about the management operations during the development phase. These types of companies may find the Strategic interactor particularly helpful in their quest for international business opportunities, because the IMC does not only creates a NW alliance, but also provides day-to-day NW management operation during the operational phases in the particular country.

The professional aspects of the Strategic interactor is strongly supported by the findings in section 4.7.4 which concluded that the informants from, every NW group, favored a more **knowledge based broker** over a **power based broker**.

The second advantage of the Strategic interactor is that his **independent status** helps to build **trust** with the NW participants. This argument resumes the Principle-agency theory presented in section 2.2.4. According to Eisenhardt (1989), *“the agency problem arises when (a) the desires or goals of the principal and agent conflict and (b) it is difficult or expensive for the principal to verify what the agent is actually doing. The problem here is that the principal cannot verify that the agent has behaved appropriately. The second is the problem of risk sharing that arises when the principal and agent have different attitudes toward risk. The problem here is that the principal and agent may prefer different actions because of the different risk preferences....”* Sections 2.4.4.3 and 2.4.4.4 showed the clear implications that agency theory has to the current situation in China. As a result of the country’s transitional economic process, many SOEs have been reformed into diversely owned shareholding systems. This has posed a challenging situation; on one hand the rapid decentralization process of enterprise reform allowed those once rigidly controlled SOEs to become more autonomous than ever. On the other hand, the systems of various corporate governance rules and control instruments put in place by the state administrations are new and imperfect. Under such circumstances, by outsourcing the management responsibility of a NW organization to an external independent NW Management company, such as the IMC, the owners of the enterprises can reduce the problems of asymmetrical distribution of information, and therefore, gain **better control of the manager’s activities through the market relationships** than through the internal hierarchy systems.

Accordingly, the advantage of the independent NW management company to the effective NW building process can also be seen among the relationships within a NW organization. As section 4.7.4.4 showed that all the participants preferred a knowledge based broker to a power based broker, this reflects their desire to have a capable broker who serves the interests of the NW as a whole, rather than only prioritizing the big partners’ interests. The section also showed participants’ concerns about potential integration by a strong lead firm broker who has all the power to do so. Here, an independent NW management company responsible for the NW owners has an explicit motive and obligation in serving the interests of the NW as a whole, to which even his own interest is tied up. In this regard, an independent NW management company is more likely to manage a balanced NW evolutionary process by maintaining an appropriate pace to all participants - as emphasized in section 5.3.2.1.2.2.

5.4.1.5 Potential Challenges to the Strategic Interactor

In view of the fact that the Strategic interactor is a new business model to the enterprises in the China's Agribusiness sector, potential issues with respect to the various NW relationships should be addressed as well. In addition to the managerial challenges experienced by the brokers and the relevant literature review presented in the previous sections in this dissertation, one potential difficulty the Strategic interactor might encounter is maintaining an appropriate balance between the big and small NW partners. In the NWs formed by the different size participants, possibly, the large size participants may attempt to prioritize their interests over the smaller partners, or as the concerns expressed by the informants in section 4.7.4.4, the big participants (normally the lead firms) might try to integrate the small partners during the NW building process. Apart from the efforts of relationship and trust development with all the NW participants as emphasized throughout this dissertation, it is also necessary at the time of the NW's formation to secure a reasonable assurance from all NW participants that they will respect those things concerning the Strategic interactor's leadership and authority in the NW. The specific clauses could be included into a well-structured **management contract**²⁸. Making a contractual arrangement of service nature between the Strategic interactor and the NW partners will not entail a higher transaction cost than the multilateral contractual arrangements between several cooperative partners. Furthermore, in order to prevent the potential damages to the NW operation from the threat of a given large partner's uncooperative behavior, the Strategic interactor should, whenever possible, appropriately develop potential alternative candidates as "standby members" to fill up gaps in case something goes wrong with the large size partners. In fact, such precautionous arrangement should be made in principle for any NW participants who want to prepare against events that might cause significant damages to the NW organization.

Although the new model of the Strategic interactor is designed on the basis of the literature review and the empirical findings of the actors' preferences and expectations in this research, it is important to know the views toward the acceptance of such a model of broker from other actors than the traditional core brokers. The following section presents the survey results on this particular aspect.

5.4.1.6 The Participants' Perception of the Strategic Interactor

This section presents the findings concerning how the NW participants perceive a "**non core firm**" or "**a third party manager**" actor (a third party NW manager means an independent NW manager to differentiate from the existing brokers in the NWs investigated) such as the Strategic interactor or IMC performing the broker's roles.

Survey results in section 4.7.4 showed that all informants, including the core firm and lead firm brokers responded positively to the idea of a third party actor playing the role of broker. In addition to the preferred qualifications of the brokers as summarized in the above section 5.2.3.1, the participants also expected that the third party managers could understand the specific business and desirably, have multi-capabilities and some international business contacts. To resume the informants'

²⁸ The form of a management contract can be referenced to a similar concept of the hotel management contract used between the property owners and the hotel management companies.

responses to questions 49 and 50 which reflected the NW participants' attitude towards the subject, as the Seeds distributor said: *"a third party manager may bring in needed resources, since the Hybrid Seeds broker is a research institution. A third party may add value in other areas."* The Beekeeper also said: *"a third party manager with strong professionalism helps to develop the market"* and the Seeds reproducer: *"a third party is fine. He should know the seeds business, and it would be good if he has the abilities in accounting, international finance and investment and has international market contacts, therefore making it possible to develop a big business"*. The Pesticide researcher said that: *"he should have broader experiences and abilities"*. Further, the herbicide producer in the Agrochemicals NW emphasized that: *"he should have the same interests and objectives as the cooperative partners."*

To conclude, the introduction of the Strategic interactor as an additional instrument for effective building strategic NWs in China's agribusiness sector is **supported** by both theoretical and empirical findings in this research.

5.5 SUMMARY OF CONCLUSION OF FINDINGS

This section summarizes the conclusion of findings linked to the dissertation research questions presented in sections 5.2, 5.3 and 5.4. The purpose of this particular section is to provide a more condensed insight to the readers.

5.5.1 Empirical Links to the Research Questions

5.5.1.1 The Environmental Aspects and the Research Questions

The most important external factors that generally influenced **the actors' strategic conduct** in pursuing NW alliance relationship in the NW groups were **favorable economic conditions** of the national economy - and in particular **State's supports** to the country's agricultural development. Also, China's **WTO accession**, **technical development**, **market changes** have created growth opportunities while simultaneously bringing pressures to the actors in the NW groups. To minimize market **uncertainties** created by the changing transitional economic process, the actors preferred to form NW alliances with other competent partners rather than to venture alone.

To the specific NWs and actor groups, the changes brought on by the **deregulation** of financial allocation policy, as well as improvement to **intellectual property protection** legislation encouraged the SORI actors to use their new technologies in cooperation with other NW participants; the reform of the **distribution systems** of agriculture production materials constituted a major strategic need for the distribution enterprises (the SODE broker and the Seeds distributor) to form NW alliances as a pre-emptive strategy in fighting against new competitors. The **SOEs reform** (aimed at improving SOEs' competitiveness in product quality, technological development, and management) became a top priority to State industrial administrators. The formations of the two INWs were each driven by two different strategies: a **growth strategy** for the Agrochemicals NW and a **phase-out restructuring strategy** for the Ammonia NW. The country's economic reform had a particular impact on the POE actors by making them actively pursue their economic objectives by forming strategic alliances with other types of actors.

5.5.1.2 The Actors Aspects and the Research Questions

In the **market initiated** DNWs and SNWs, the each individual actor possessed **different professional backgrounds and organizational natures**. Though they specialized in different functions they still had **common interests** in joint business activities. Since each actor had only one **core competence** relevant to the functions in the value chain of the respective business processes, by cooperating with other partners, the actors could **combine their complementary strength** at lower costs. Along with this, each of the participants could still keep their original individual activities and obligations in addition to the alliance commitment. Most of all, between the firms and individuals, developing **good cooperative relationships and trust** contributed significantly to each NW's successes.

Nearly all of the actors belonging to the INWs were **SOIE actors** who were technologically outdated and severely pressured by the new competition created by the new economic situation. Furthermore, the formation of the two NW organizations was **strategically decided by the respective parent organizations**.

The actors' attributes were also reflected by their behavior during the NW building process. The SOE actors were used to functioning within an **integrated organization structure** and tended to follow a more **bureaucratic procedure** (the Compound fertilizer NW). Contrary to these habits, a POE dominant group of actors (the Biofertilizer NW) demonstrated strong **entrepreneurial spirit** by concentrating on the business objectives rather than the formational particularities - consequently achieving good business results. Moreover, the brokers' different managerial styles and thinking were shown in how they handled relational arrangements. The SOE brokers emphasized the more **traditional command** type of hierarchical organization structure with tight contractual controls, while the loose coupling systems used by the **market initiated** NW brokers emphasized more on **market mechanisms and relationships**.

5.5.1.3 The Objective Aspects and the Research Questions

The individual objectives of each actor in the DNWs and SNWs differed according to each actor's organizational and business nature. These individual objectives were commonly grounded with respect to their decision to form NW alliances. This coincided with the actors' interests of "**responding to growth opportunity**," "**improving product quality**," "**incentives of engaging in economic activities**," "**learning**," "**gaining market share**," "**reducing market uncertainty**" and "**sharing cost**."

Although it was also found that the brokers' objectives were the **basis or starting point of the NW objectives**, the brokers in the DNWs and SNWs effectively **integrated partners' individual interests into the common NW objectives** during the formational phase and, subsequently, managed congruent paces of development processes of achieving the NWs' objectives.

Given that the two INWs were **command-initiated** NW organizations, the individual actors had no choice but to follow the overall strategic objectives set by the corporate brokers. Responding successfully to these opportunities and challenges, with regard to the establishment of a **strategic position**, was an important strategic step for the State broker. However, he failed to bring about a **congruent commitment to the overall strategic objectives** from the key managers.

The SOIE broker's objective in forming the Ammonia NW was to strategically implement the **restructuring strategy** and operationally **centralize the marketing**

activities of the six plants. The problematic situation was mainly due to the existence of **gaps** between **the objectives, the market, and the traditional structure** of the Ammonia NW. It was indicated that introducing a diverse ownership shareholding system would further allow the individual managers to take stakes in the organization - and, consequently, take innovative initiatives in **revitalizing the enterprises**. This was the overall objective of the SOIE broker.

5.5.1.4 The Resource Aspects and the Research Questions

From the resources perspective, the factors that influenced the actors in the NWs' formation were mainly the result of the **complementary combination** of each actor's resources. Given that **no individual actor in the NW groups had all the necessary resources** required to achieve his objectives, one of the most important conditions of the actors – in relationship to NW cooperation – was the need to share vital resources from other partners at low cost and low risk. All actors in the NW groups considered 'complementary resources' as an **important criterion of the preferred cooperative arrangement** in the agribusiness sector. Consequently, the complementary combination of resources was one of the direct causal factors to the successful performances of the DNWs and SNWs. The brokers' effective organizing efforts were reflected from their identifying **nonredundant actors with complementary resources** and persuading them to form the respective NW alliances.

Resource allocation to the two INWs varied according to the strategic priority setting by the State industrial administrators. However, the different outcomes of the two INWs indicated that **a strong resource base, alone, could not make the NW building process a success** if the other elements (as discussed throughout this dissertation) were ineffectively managed.

5.5.1.5 The Activities, Relationship Aspects and the Research Questions

From the activity and relationship perspective, the successful results achieved by the actors in the DNWs and SNWs were largely attributable to the **combination of complementarity activities** - among the NW participants. Although some concerns were shown about the possible disadvantageous aspects of the combination of complementary activities in a NW - such as **communication barriers** between the partners from different professional fields and **risk of knowledge loss** - no evidences of such issues have been found in the group of NWs of this dissertation. The brokers' roles in the DNWs and SNWs, concerning the activity aspects merited mainly by their effective actor organizations, were not only **nonredundant** to each other's activities, but also relevant to the specific function in the value chain processes.

The State broker, when combining the members' activities in the Agrochemicals NW, paid less attention to the **interpersonal relationship** aspects than asset aspects. Consequently, his inability to combine the members' activities with **a complementary relationship arrangement** became a major causal factor of the NW's failure. The **combination of similar activities** in the Ammonia NW was advantageous in terms of marketing coordination, cost reduction, and sharing certain resources among its members. But integrating the operations of the six firms without resolving the fundamental issues of **redundancy** (created by combining similar activities) caused an inefficient NW operation.

Another important dimension was the fact that the actors' activities in the NW groups were combined by different coupling systems. **A loosely coupling system** or

informal cooperative arrangement reflected interdependent cooperative relationship patterns and was considered particularly advantageous for its **flexibility and effectiveness** by the participants in the market initiated NWs. While **formally combining actors' activities** was one of the main characteristics of the INWs, wherein the actors' original activities were integrated within a **traditional organizational structure**. Within such structures, the relationships between the participants were more regulated by **control** mechanisms than by the **market** elements, and the participants had less autonomy in their business activities than the actors in the NWs with loose coupling systems. Despite the differences resulting from the coupling systems opted by each broker for the respective NWs, one common ground pertaining to the relationship pattern is that strong **interdependent relationships** between the actors in the market initiated NWs were evident. An **evolutionary characteristic of the informal cooperative relationship** between the NW participants was found of essential importance for building trust between the partners and, therefore, had great impact upon the NWs' building process. From the view of organizational development, **a either looser or tighter form** of cooperative partners' - relationships in the NW groups may call for rearrangements since there is an ongoing and changing process. Namely, the formal NWs may be developed into informal NWs and vice versa.

5.5.1.6 The Roles and Behavior Aspects and the Research Questions

The findings show that a changing process characterized the distribution of roles and actors' behaviors in the NW groups. Since the reform began, many new competitors challenged the previous exclusive role of SOE distribution systems. To survive, the SOEs had to proactively pursued competitive strategies. Similar process and rationales which influenced the SORI actors to perform new roles with commercial dimensions were likewise the reason behind their decisions to participate in the strategic NWs. The POE actors also played important roles in the NW groups. Furthermore, the change of behavior of the Government actors manifested from their previous controlling functions to the present **facilitator roles** in the NWs investigated. At the NW level, each of the participants in the NW groups (except for the Ammonia NW) played **a distinct function** in the value chain process. Given that the businesses demanded that each NW participants' fulfill his specific tasks on time, and with good quality, the actor's **capability** of delivering results was a precondition to the good results of the successful NWs. In addition to a high-level of competence, the attitude and behaviors of the NW participants (with regard to cooperative relationship with others in the NW) had a great impact on the NW's performance. In the DNWs and SNWs, each actor respected the valuable roles played by his partners. As a result, the NW's operations directly benefited from **cooperative behaviors and trusting relationships** between the participants. Contrary to that, in the Agrochemicals NW, the **role redistribution** changed the relationship structure. The broker's inability to handle the relationship problems between the key managers led to the rise of **competitive behaviors**, damaging the NW. In the Ammonia NW, the broker could not effectively stop the reemergence **internal competitive behaviors** within the NW - due to the **activity and resource redundancies** of the members. All of these problems were further compounded by the oversupplied market.

All of the brokers in the NW groups, in addition to their individual **functional roles**, played the roles of **creator** during the **formational phase** and **lead operator** during the **developmental phase** - although each with a different management style. Finally,

it was anticipated that the further development of the NWs during the **transtage phase**, the new activities and relationships, and a need for new resources would emerge -which would then accordingly call for brokers with required new skills and capabilities.

5.5.2 Theoretical Links to the Research Questions

5.5.2.1 The Transaction Cost Perspective

The transaction cost perspective was **generally** a concern to all the actors in the NW groups. The actors in the DNWs and SNWs, by forming NW alliances with other actors who had desired resources, effectively minimized cost in achieving their commonly interested objectives. In the INW, too, the decisions to integrate a competitive R&D base of new products and the merger of the existing manufacturers into a strategic position were aimed at avoiding capital-intensive investment; all explained the concerns of cost by the central and provincial industrial administrators.

5.5.2.2 The Game Theory perspective

The game theory perspective, generally, was **highly supported** by the findings among the NW groups. The implications to the theory were seen from the two types of behaviors which existed among the NWs - the cooperative behaviors represented by the actors in the DNW and SNW groups; and competitive behaviors represented by the actors from the two INWs. These two distinct patterns of behavior had resulted from the different consequences to the NWs' outcomes.

5.5.2.3 Resource Dependency and Resource Based View of the Firm Perspective

The resource dependency perspective was **strongly echoed** by the findings in the NW groups of this study. The informants from all NW groups believed that the most preferred form of alliance cooperation in the agribusiness sector is that of organizations cooperating with complementary resources. In addition, most of the actors in the NW groups placed importance on **knowledge types of resources**.

5.5.2.4 Principal Agency Theory Perspective

The supporting facts to this theory are demonstrated by **the advantages of the NW structure** - as most of the activities in the NW groups were conducted separately along a value chain operation. Cooperative operation was limited to certain activities between the upstream and downstream partners within a NW. With externalized relationships, the control mechanism for the participant's activities function by market forces rather than by the internal hierarchal systems - which entail high costs in corporate **governance** by reinforcing **control systems** and organization **rules**. The advantages of operating with externalized relationships are particularly evidenced in the DNWs and SNWs. Principal agency theory has been found supportive to the introduction of the new broker model of this dissertation as well.

5.5.2.5 Network Perspective

The NW perspective has high **explicative power** in relationship to the strategic conduct of NW alliance formation. Factors which support the theory's explanation of

NW formation found in this study included environmental factors and the actor's motives and objectives in responding to the changes in the competitive environment. Since the actors were constrained by their limited capacity as individual institutions or traditional two-partner cooperation, they could not command competitive advantages. By forming a NW alliance, specialists in each field were allowed to cooperate, and exploit new opportunities much faster than if each were to try to acquire the industry-specific skills and assets of others. Additionally, the firm's strategic conduct in forming NWs was also impacted by the relationships between the different actors. Finally, the findings of this study **strongly support** the theory's hypothesis concerning recruitment patterns which result from different organizing efforts to create a NW alliance - the broker roles and behaviors in the NW building process.

5.5.2.6 Broker's Roles, Strategic Process and Performance of NWs

The empirical findings of this research, in relation to the impacts of the brokers' roles and behaviors to the NW building process and outcome, are principally in conformity with the theoretical explanations.

Findings showed that during the formation phase the brokers in the NW groups actually executed tasks which **combined the architects' and some of the lead operator's** roles - the brokers in the NW groups carried out tasks of a **complete NW creation process**. Consequently, during the formational phase, the brokers in the NW groups would be more appropriately referred to as **"creators"** rather than **"architects,"** since their roles were merely part of the process of the NW creation. As each NW moved into the operational stage, the brokers played roles of **'lead operator'** – as is defined in the literature. The brokers of the DNWs and SNWs also performed **functional roles** as other NW members on the specific domains of the value chains in each NW.

5.5.2.7 Power and Influence of Brokers in the NWs

Both empirical data and theoretical measures concluded that, due to their key resources control or command positions, **brokers are the most central actors** within the boundaries of each NW. This centrality within the NWs enables the brokers to enjoy a position consisting of power (degree), efficiency or independence (closeness) and controlling or increasing dependency of the NW members (betweenness). However, when dealing with the system-wide properties of the NW or the extended NW relations, as the centrality of the NW members increases so does the dependency of the brokers on them.

By forming cooperation with partners of **maximum non-redundancy primary contacts** and **diversified resources and competences**, the brokers had the largest volume of **structural holes** between their contacts. These would then function as ports of access to great number secondary contact clusters. Therefore, the actors (and in particular the brokers) enjoyed more NW benefits. As the NWs continue to develop, the brokers will have to identify and fill up new structural holes in order to meet the needs of new opportunities and challenges. The contact clusters in the Ammonia NW were almost **completely redundant at both primary and secondary levels**. Consequently, given the NW poor standing of structural holes, the NW had little benefits.

5.5.2.8 Development of Culture, Personal Relationships and Trust

The brokers from all NWs commonly experienced that **coordinating relationships** among the partners, and other stakeholders, was the most important task for them to execute when the NWs entered into the development phase. Further, the NW participants viewed **trusting** relationships among partners as the most important factor to success. The findings have strongly confirmed that the brokers' different ways of handling the issue of personal relationships and trust have great impact on the behavioral patterns of NW members and, therefore, on the different outcomes of the NW organizations. Also, informants believed that **loosely coupled relationships** between the cooperative partners **reduced the danger of potential cultural conflict**.

5.5.2.9 Management Style

Findings confirmed that brokers' different management styles had direct impact on the success of NW building process. The brokers in the DNWs and SNWs contributed particular success to the NWs' results by demonstrating an effective **people orientated leadership style**. The disagreements among the NW participants were resolved through **consultation, compromise and accommodation; the brokers** exerted efforts to encourage effective communications between the members and stakeholders, recognized and took into account both individual member interests and collective NW interests, effectively managed the developmental processes, and provided the members of each NW with appropriate and adequate information. The NW participants were felt satisfied with regard to the opportunity to express relationships, decision-making processes, obligations to the written rules and procedures, and informal interactions, as well as exchange of ideas between the NW participants.

The brokers in the INWs demonstrated different kinds of **autocratic and task-oriented leadership styles**; disagreements were normally resolved through **executive orders** and communication was conducted more **formally and impersonally**. The State broker failed to act upon political problems by either enhancing **team building work**, or **removing the troublemaking elements**. NW participants complained that others' ideas were **imposed** upon them and that the lead operator provided only **limited** information to the members. Furthermore, written rules and procedures were **not** followed.

5.5.2.10 Managing Different Types of NWs

The broker's managerial behaviors, in relation to the different types of NWs, were found to be in line with theory. The Seeds and Bee brokers confirmed the literature which stated that searching for capable new partners for the NWs' expansion was a key factor for the success of developing a dynamic NW. The experiences of the SNW brokers verified the theory emphasizing an efficient operation in the NW process as the key to success in a Stable NW. Finally, the troublesome building process in the INWs - the Agrochemicals NW in particular - confirmed that corporate intervention is the most common managerial misstep in an Internal NW.

5.5.3 Broker Links to the Future Network Development

5.5.3.1 Effective Broker Performance - Expectations of the NW Participants

Both literature and empirical findings showed that the strategic building process of NWs in the present China's agribusiness sector would require a broker to have an **integrated capability** in order to perform an effective role in building strategic NWs. According to the results of twenty-eight interviews, an effective NW manager should have **strategic vision, leadership skills and managerial experience, professional knowledge** (referring to functional expertise), **communication skills and broader social network of relationships**. They should be **capable of coordinating and organizing collaborators with different cultural backgrounds**. The brokers' **ability to implement business strategy** was particularly emphasized. In addition, the informants also believed that an effective broker should demonstrate **understanding, commitment**, and have a **trustworthy, magnanimous and broad-minded personality**. Furthermore, a **knowledge-based broker** who serves the interests of the NW as a whole was favored more than a **power-based broker** who might only prioritize the big partner's interests and have the potential tendency to try to integrate the smaller partners. It was also believed by the NW participants that a **consistent management** would allow a broker to accumulate relevant knowledge and experience about the different stages of NW building process while building up longstanding personal relationships with the partners.

5.5.3.2 The Strategic Interactor – A Recommendation

As China's economic reform process continues, more NW alliances between enterprises in the agribusiness sector need to be created. As NW development lays primarily on the organizing efforts of the brokers, few brokers - few NW organizations exist. Despite the achievements of the **traditional lead firm or core firm brokers**, their intrinsic limitation (from developing NWs point of view) is that they only start to act as brokers when the formation of NW(s) is seen as necessary for their own strategic interests. Thus, a new model of broker, called the **Strategic interactor** or **Industrial Management Company (IMC)**, is introduced as an additional instrument for effectively building strategic NWs in China which will better fit the contextual elements of the research questions.

The definition and objectives of the Strategic interactor, and some of its basic organizational and operational attributes are given as: **"The Strategic interactor is an independent business institution with multifaceted competencies. It specializes in creating and managing strategic NWs by proactively interacting between the institutions, with existing or potential cross-functional relationships, in the selected business sectors in China."**

This study argued that the two distinct advantages the Strategic interactor has over the traditional core firm or lead firm brokers are **professionalism** and **independency**. Both are found as having direct links to the **development of trust** - the key factor of strategic alliances. Concerning professionalism, the arguments are: 1) the Strategic interactor is a committed full time professional NW builder, 2) they understand the operational logics of different types of NWs therefore, avoiding common NW errors, 3) the coordinating efforts of a NW mindset professional manager fit more effectively into the relationship context of NW process than the adaptive efforts by a traditional lead firm manager, 4) a dedicated professional IMC can provide a more **consistent management** process to a NW organization than any other NW participants who

normally have other core activities and commitments in their respective organizations outside the NW, 5) the Strategic interactor may build trust among the NW members more easily than a traditional core firm or lead firm broker - whose' execution might be often biased by his past ties with the particular NW participants, 6) a professional NW IMC with **cross-cultural expertise** can provide confidence to the foreign firms in forming NW cooperation with the local partners [in addition to the costly formal arrangements that most of the foreign companies have used so far] and finally 7) the Strategic interactor can be particularly helpful in the SMEs' quest for international business opportunities, because not only does the IMC create a NW alliance, but they also provide day-to-day NW management operation during the operational phases in the particular country. The professional aspects of the Strategic interactor are strongly supported by the survey findings as well. Informants from every NW favored a more **knowledge-based broker** over a **power-based broker**.

The second advantage of the Strategic interactor is that their **independent status** helps to build **trust** with the NW participants. This is theoretically backed by the Principle-agency theory in terms of outsourcing the management responsibility of a NW organization to an external independent NW Management company, such as the IMC, the owners of the enterprises can reduce the problems of asymmetrical distribution of information, and therefore, gain **better control of the manager's activities through the market relationships** than through the internal hierarchy systems. Furthermore, an independent NW management company responsible for the NW owners has an explicit motive and obligation to serve the interests of the NW as a whole - to which their own interest is tied up, thus making them more likely to manage a balanced NW evolutionary process by maintaining an appropriate pace to all participants.

As a new business model, one potential challenge the Strategic interactor might encounter is maintaining an appropriate balance between the big and small NW partners. This study concludes that the introduction of the Strategic interactor as an additional instrument for effective building strategic NWs in China's agribusiness sector is **supported** by both the theoretical and empirical findings of this research.

5.6 LIMITATIONS AND FUTURE RESEARCH

As explained from the outset of this dissertation and as compared to the traditional formal cooperative arrangements, the NW form alliance is less commonly practiced in the agribusiness sector in China than in the Western countries. Given the paucity of NW cases, some limitations to this research had certain consequences in determining the methodology, research topic, and empirical field.

Firstly, the research results of this study should not be generalized to the entire agribusiness sector indiscriminately. The sector covers a wide range of industries such as agricultural machinery, food and beverage processing, animal husbandry and fishery, horticulture and so on. Some of the relationships in those industries can be quite different from those in the empirical cases selected in this research. Furthermore, the non-generalizing aspect is also due to the qualitative research method used in this research, which was not for statistical generalization, rather for replication logic. Secondly, because of the resource constraints, a more desirable data collection process by more people over a longer period of observation time was not able to be

realized; therefore, most of the time only one single person conducted the data collecting process with a strong fivefold triangulation interviewing method.

This dissertation recognizes the significant contributions made by those actors who played broker's roles in the strategic building process of the group of NWs investigated in this research. As a continuation of this research, further studies are needed to test out the actual functioning of the proposed independent Strategic interactor in the strategic NW building process; preferably, using an *experiment research strategy* (Yin, 1994:6) if conditions allow. In order to verify the findings of this study in different environmental settings, future research should include other industries in the agribusiness sector as well as business sectors in China other than the agribusiness sector. With foreign companies increasingly expanding their operations to China, studies of broker roles in relation to the NW process-performance links may also include Sino-foreign dimensions, so that some variables such as cross-cultural aspects in the NW context can be examined in relation to the Strategic interactor's role.

Internationally, it may be useful too, to carry out similar research in the countries which are experiencing similar transitional economic processes and with similar environmental features like China. Moreover, in the context of a **new form of independent professional organization**, the role of the Strategic interactor may well deserve some studies in the developed countries in relation to the NW building process of the SMEs.

As the development of China's transitional economy continues, the globalization process, the competition of new products and technologies, the demand and emphasis on value added services, the emergence of flexible manufacturing to meet this demand, the rapid environment changes, and an increasingly mobile and heterogeneous work force - all of which, as emphasized by those authors presented in section 1.1, combine to create conditions of unprecedented knowledge intensity, uncertainty, ambiguity, and risk.... in order to respond to these conditions, Chinese enterprises, too, must be fast acting, flexibly responsive, and knowledge intensive. This calls for replacing traditional approaches with more adaptive and self-designing, NW organizations.

Furthermore, to recall the three major reasons of explaining the increased interest in the concept of NWs (in both academic and business arenas) by Nohria (1992) presented in section 2.2.5, the first and second reasons, the **new competition** and the **technological developments** have well taken place in the process of China's economic development. However concerning the third reason, the **maturing of NW analysis**, as an academic discipline is not yet, a phenomenon as compared to what Nohria described: "*today interest in the concept of NWs is no longer restricted to a small group of sociologists. It has expanded to include students of organizations in such applied, interdisciplinary settings as business schools.*" It is therefore, the hope of the researcher that this work motivates more academic studies to be carried out on NWs in China - and particular, on how strategies are formulated and implemented by the Strategic interactor in the NW building process in China, and probably in other emerging economies as well. Moreover, It is also the hope that some entrepreneurs can empirically test the Strategic interactor model in the real business world.

Finally, to bring it up again, the statement of Hinterhuber and Levin (1994:43) presented at the beginning of this thesis, "**Strategic networks - the organization of the future**" the researcher would like to conclude this dissertation by suggesting a possible, more optimistic title: **Strategic interactors - the dedicated builders of future organizations.**

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APPENDICES

Appendix I: Case Studies (6 cases)

CASE 1-6: THE HYBRID SEEDS NW

I. The Actors

1. Beijing Hybrid Wheat Research Center (the Seeds broker)

The Seeds broker is an institute belonging to the Beijing Academy of Agriculture and Forestry Sciences (BAAFS), specialized in researching hybrid wheat seeds technology. The center has 20 scientists with well-conditioned research facilities in its 10 different experimental stations and two seeds pilot research bases in China's major wheat-growing regions.

2. The Agriculture, Industrial and Commerce Corporation of Gaoliying Town (the Parent seeds producer)

The Parent seeds producer is a business enterprise under the Gaoliyin Township Government. The company's activities are in line with the tasks of the local administration in developing the agriculture based rural economy. Its business scope includes mainly handling agriculture means and materials and developing agro produce processing industries. Among these activities, the firm is in cooperation with the Seeds broker in parent seeds production.

3. The Science and Technology Committee of Funan County Government (the Seeds reproducer)

The Seeds reproducer is one of the departments of the Funan County Government. The committee is responsible for the development of Science and technology in the Funan County. Reproduction of hybrid seeds is one of the important activities that the committee involves as part of its functional tasks.

4. Tianjing Baodi County Seeds Company (the Seeds distributor)

The Seeds distributor is a State owned enterprise specialized in distributing seeds to the Baodi County and nearby regions. The distributor purchases seeds from seeds breeding firms and then distributes the products to retail levels and farmers. The Seeds distributor has its technical team specializing field demonstration and technical service in introducing new variety seeds.

II. Background

In 1996, headed by Prof. Zhao Changping, director of the Seeds broker (Beijing Hybrid Wheat Research Center) accomplished "a study on the coordinate balance of the wheat yield form systems." The project focused on key aspects of wheat cultivating technology while systematically exploring the self-adjusting character and yield formation of wheat. Prof. Zhao primarily bred out a passel of good photo-thermal sensitive sterile lines at north winter area. He also established a set of techniques, which speedily bred good photo-thermal sensitive male sterile lines by synthesizing traditional breeding technique, hybrid-breeding technique, and biology techniques. This result resulted in the world leading development of a new cutting edge technology in production of hybrid wheat seeds. However, since the purpose here is not to elaborate the details of the scientific dimensions of the hybrid wheat

technology its academic contributions and the scientific significance have been omitted. However, as a simple indication which may demonstrate the practical value of the invention is that by sowing the hybrid wheat seeds produced with the new technology, farmers can gain an additional yield of 15- 20% of wheat production without putting any other additional technical inputs. For a farmer, the return of the wheat production is 10 times than the cost of the new seeds.

The Seeds broker maintained a low profile on the invention until it was secured by completing a stabilization process which technically prevented any possible imitators from copying the technology (it would take six years for an imitator to reach the same levels of the result, even if they possessed full access to the technology) and obtained patent protection. Prior to actions taken for transferring the research result into a business stage, the Seeds broker did consider the possible options such as having licensing agreement or royalty arrangements with a commercial seeds company. However, their greatest concern was knowledge leaking. Consequently, the Seeds broker embarked on a mission to produce and commercialize the hybrid wheat seeds. This consisted of three basic sets of activities: 1) parent seeds production; 2) hybridizing and reproduction; and 3) marketing finished products to users (including technical promotion activities and field trials).

The hybrid breeding process required that the parent seeds firstly produced in a region situated at northern latitude of 40 degrees (such as in Beijing region) while the matting and reproduction base needed to be situated in a region with north latitude 30-35 degree.

The Seeds broker considered Shunyi County, 60 kilometers away from Beijing, as the parent seeds production base for its close geographical location, climate condition and sufficient land. Additionally, the Seeds broker previously provided technical training courses to the agrotechnical force of Gaoliyin Township Government, and a good personal relationship was already established between Prof. Zhao and Mr. Liang, the deputy director of the Parent seeds producer. Due to resource constraints, in terms of land space and financing, Prof. Zhao, in September 1996, told Mr. Liang about his idea of using Gaoliyin as a metaphase experimental base for the research project and Mr. Liang welcomed the project. Since then, the research team in the Shunyi base received large support from the Parent seeds producer in areas such as free transportation, food and lodging, organization of farmers, local work coordination and so on. In addition to the good personal relations between Zhao and Liang, the Parent seeds producer had still other two reasons to support the Seeds broker's operation: first, the activity was in line with its duty of promoting new technological development in the local agricultural industry; second, the Parent seeds producer was well aware of the value of the project and regarded it as an potential opportunity for future business.

In 1995, Mr. Xiang Tianfu and his colleagues from the Science and Technology Commission of Funan County also learnt about the Seeds broker's activities - in the field of hybrid wheat research. Through their contacts in the China Academy of Agricultural Science, the Seeds reproducer came to the Seeds broker and offered their region as a field base for conducting a reproduction experiment. Funan County has a suitable location in Northern Latitude of 30-35 degrees as required and other natural conditions such as low temperature and weak sun rate - all of which were elements for an ideal seeds reproduction environment. Besides, Funan belongs to Anhui province - which was also the hometown of Prof. Zhao. He had some personal contacts and

former schoolmates serving in different local governmental institutions. Consequently, the Funan County was chosen as the metaphase test base hybridizing and reproduction operation. The Seeds broker carried out the operation on the two different bases. Operationally, the parent seeds produced in the Shunyi base were transported to the Funan base (about 855 kilometers away from Beijing) for hybridizing and reproduction. The research operation was carried out rather smoothly in the two bases for about three years until the time came to a stage of large-scale seeds production in both two sites. During this period, the Seeds broker rented lands from the farmers who conducted the parent seeds production in the Shunyi base and planned to purchase additional land in Funan for the expansion of reproduction operation.

III. The formation of the Hybrid seeds NW

The expansion of the parent seeds production in Shunyi required the ability to manage a large-scale farming operation. However, from its past three years experience, the Seeds broker realized that it was not a good idea to manage the field operation by itself - due to the fact that many basic farming practices (such as handling agro machineries, field irrigation, application of pesticide and fertilization etc) were not really its strength- On the contrary, these things were experienced as high cost, high risk, and ultimately inefficient activities. The other challenge faced was that more land for the expansion required skills in organizing and managing many individual farmers; again, this wasn't an easy job for the Seeds broker either. Finally, the Seeds broker was convinced that entrusting a local partner with a governmental influence to take care of the field operation, while keeping the most sensitive technology of the parent seeds production in its own base in Shunyi, was a better choice than doing everything by itself.

The Seeds broker discussed the matter with the Parent seeds producer and the later showed great interests in the cooperation, for this operation was not only to bring some new revenue but also, from a strategic point view, the Parent seeds producer looked at a bigger picture – future business opportunity in the North China wheat growing regions. The move was soon proved a wise one for both sides. The Parent seeds producer, with its influence as a local governmental department, (perceived by the farmers as an official and a trustworthy body rather than a solely commercially motivated firm) effectively organized individual farmers in the county to grow the seeds by following the technical instructions provided by the Seeds broker. With technical support from the base, the Parent seeds producer conducted a monitoring program on the farmers' operation. Upon harvest, the Parent seeds producer collected from the farmers the seeds that met the specified quality standards and delivered the products to the Seeds broker at a premium price. Both farmers and the Parent seeds producer were happy about this profitable operation.

The next phase was the hybridizing and reproduction process, which compared with the previous one, required even more mobilizing efforts in organization and management of an even greater number of farmers engaging in an operation with some technical and administrative dimensions. Following the experience learnt in Shunyi (that a local government influencer did better job than the Seeds broker itself) the same model of cooperation with the Seeds reproducer conducting the reproduction was negotiated, agreed upon, and soon became operational. The local government welcomed this arrangement as in the Shunyi's case. It was perceived as a rewarding exercise that fitted ideally with their administrative duty of promoting agro-scientific

activities and creating income-generating opportunities for the local farmers. The Seeds reproducer had a chance to earn additional revenue as well.

IV. The development phase and NW performance

The cooperation in the hybridizing and reproduction processes was conducted in a way that each year, around July or August, the Seeds broker and the Seeds reproducer met for the annual operational arrangement. The arrangement included the determining of the quantity of the seeds to be reproduced, quality and specifications, price and payment terms and responsibilities of each party etc. - based on the contracted quantity of seeds and prepayments received (normally 50-80% of the total payment) for the coming year, from the seeds companies. With the agreement signed, the Seeds reproducer started its implementation accordingly in Funan through a three-tier system – 1) the technical force of the Seeds reproducer, 2) township technical contractors which consisted of individuals, farms and other relevant entities, and 3) farmers who conducted field operations. There were agreements signed on a yearly basis, as well, between the Seeds reproducer and the second tier contractors. Then the second tier contractors had agreements in oral or written forms with the third tier, the farming operators. The Seeds broker has 10 technicians based in Funan County to provide technical support and control on the crucial parts of the operation.

The process of seeds reproduction at Funan County was carried out firstly, by distributing the parent seeds to the contractors and farmers, and then, followed by monitoring the operational process which included activities of control of growing time and observation of wheat blossoming etc. The second part of the operational processes occurred at the time of harvest and included pre-screening and dispatching samples collected from each grower to the Seeds broker for analytical checking. The third part of the process involved the confirmation of acceptance of samples, collecting and packing the seeds with the Seed's broker's special bags and then delivering the goods to the Seeds broker. The operation was completed around September of each year.

The success of scale operation in the field environment depended heavily on the effectiveness of technical training activities. The Seeds broker provided training courses to the Seeds reproducer's technical force and the later then trained key contractors who then taught the farmers. Like the Parent seeds producer in Shunyi, the Seeds reproducer's staffs were very capable in conducting training activities at the field level due to many years experience of agro science and technology extension operation. Besides, quality control was another important task for the two bases to perform for that cases were found that some farmers delivered the assignment mixed with fake seeds and some constantly failed to deliver the goods with required quality. When such things happened, the Parent seeds producer and the Seeds reproducer were found in a particularly strong position to take measures such as withdrawing the contracts from the offenders or taking other appropriate administrative actions.

With the final product available for market, the operation proceeded to the stage that involved those seeds companies which have contracted the goods with the Seeds broker. The Seeds distributor concentrated its product line on the three major crops - corn, rice and wheat. With corn and rice seeds becoming generic items in the market, the Seeds distributor is constantly looking for new products with mid long-term prospects, and wheat is a major crop grown in the Baodi County. Mr. Jiao Chengxing, a graduate from the Tianjing Agriculture Institute and manager of the Seeds distributor, had some contacts with the Seeds broker as early as 1988. He recognized

the potential of the hybrid wheat seeds and entered into a cooperation of promoting the seeds in Baodi County. Like most of the new technical inputs in agriculture marketing, the seed business is characterized by intensive field operations. Technical demonstrations had to be carried out at the field levels to convince farmers to accept the new variety of seeds, and to calm the local seeds dealers - who were worried about the relatively high price of their new seeds. As part of the cooperation, the Seeds broker provided free technical services and seeds in connection to the field demonstrations. It was a similar situation in Baodi as they were in Shunyi and Funan. The local government of Baodi County played an important role in organizing farmers, agricultural workers, agricultural administrators, agribusiness organizations and seeds dealers participating in the introductory activities of the new seeds, this, obviously added value on the credibility of the product. Followed by the good responses from the market, the cooperation between the Seeds broker and the Seeds distributor have developed from the initial promotion activities to distribution of seeds to even further channels. During the commercial process, the Seeds broker continues to provide technical services to the farmers at the Seeds distributor's coordination. Up to now, there are several hundreds Mu (Chinese unit, 1 mu = 1/15 of a hectare) of the wheat fields in the Baodi County which have been sowed with the hybrid wheat seeds from the Seeds broker. The seeds were in short supply and all seeds firms wished to have the product integrated into their product line. Mr. Jiao thinks that with further development of the business, the Seeds distributor's special relationship with the Seeds broker should be consolidated with a clear legal contract. So far so good. The Seeds broker, the Parent seeds producer, the Seeds reproducer, the Seeds distributor and the other stakeholders were all satisfied with the benefits obtained from this loosely linked. However, as the business develops, Prof. Zhao has to spend more than 70% of his time looking after the business operation, leaving him very little time to do research work.

Concerning the future development of the business, some views were expressed among the partners. For example, Mr. Tian, the Seeds reproducer believed that with the business growing into a large-scale operation, the present management would not be suitable to manage the business. It is his view that both the Seeds reproducer and the Seeds broker should return to their original positions playing governmental and research roles, and that a specialized business enterprise be brought in to manage the large operation. Mr. Liang of the Parent seeds producer also expressed that managing a larger scale business operation was not a particular strength of the Seeds broker.

Facing the situation that several multinational seeds giants intensified their penetrating efforts in China after the country's accession into the WTO, the Seeds broker (while continually developing its domestic market position) also actively sought out expansion into the major wheat growing countries such as USA and Canada. With some financial investors, new businesses and offers of cooperation from the renowned multinational seeds firms knocking at his door, Prof. Zhao was clearly aware of a fact that the business has arrived at a key stage of concern for its future. The future depends largely on how the Seeds broker organizes its business activities.

CASE 2-6: THE HONEYBEE NW

I. The Actors

1. Beijing Yong An Xin Bio-pollination Limited (the Bee broker)

The Bee broker is an enterprise run by the Bee research institute in Beijing Academy of Agriculture and Forestry Sciences (BAAFS). The Bee broker has proprietary technology and an influential image in the bee industry. The company implements a “green” strategy by providing bee pollination service to the vegetable and fruit farmers in the rural areas and, in turn, brings honeybee based, nutritious products and high quality fruits and vegetables to certain niche markets in the urban areas.

2. Beijing Vegetable Research Center (the Vegetable researcher)

The Vegetable researcher is a research institute of BAAFS specialized in research of new variety of vegetables. During recent years, it has successfully bred dozens of excellent vegetable varieties. The center is one of the most active units in the academy engaging in market economic activities.

3. The Association of Science of Pinggu County (the Science administrator)

The Science administrator is a department of the Pinggu County Government. The main function of the association is to carry out educational programs and provide science and technology information to the rural population.

4. Jing Hua Bee Industrial Association (the Beekeepers association)

The Beekeepers association was formed by more than 100 individual villagers 1 (totaling 180,000 honeybee colonies) in the Hongshimen village located in the Northeast part of Pinggu County - about 70 kilometers from Beijing. With apiculture as their main economic activity, the villagers produce more than 100 tons of honey, 2,500 kg of royal jelly and 10,000 tons of other bee related by-products each year. The individual beekeepers operated the apiculture activities fragmentally until 1999. The association was formed for the purpose of the members’ benefits -in terms of lobbying favorable policy and treatment, helping members improving their productivity and creating business opportunities for them. The association has long term honey supply agreements with foodstuff exporters.

5. Yangzhen Service Station of Vegetable Production and Supply (the Township administrator)

Yangzhen is a township belonging to Shunyi County, 55 kilometers from Beijing. The main tasks of the Township administrator is to provide free services in training farmers on farming technology, promoting new varieties of crop or plants, providing market information, and introducing sales channels. It also involves some economic activities such as distributing agrochemicals and fertilizer products to the local vegetable growers.

II. Background

During the 1990s, public awareness became greater about one of the negative consequence of substantial application of pesticide - reduction of pollinating insect population of in the natural environment. This ecological unbalance resulted inefficient pollination on various plantations that further led to poor crop production. Under such circumstances, farmers had to employ additional workforces to conduct pollination manually by treating each flower during the flowering season. The cost of

such labor intense work was high and had poor results. The farmers' businesses were adversely affected by this situation.

The Bee research institute and the Vegetable researcher in BAAFS conducted bee pollination experiments in both greenhouse and open-air vegetable fields. The method was conducted at the time of pollination season; specially arranged boxes containing honeybee colonies are placed according to a technically designed distribution order. The placement of colonies in an orchard is important to maximizing pollination benefits throughout an orchard in small groups of four to eight hives. Ideally, no trees should be more than 100 to 150 yards (91-137 m) from a small group of hives. Honeybee colonies used for pollination should be 1 1/2 to 2 story hives and have a bee population of 25,000 to 30,000 bees. However, estimating colony strength is difficult, even for many beekeepers. The general recommendation used for evaluating colony strength is based on the amount of brood (developing bees) in a colony. Hives used for pollination should have at least 6 frames with brood and a sufficient number of adult bees to properly care for the brood. The Bee research institute has designed a special positioning scheme of pollination boxes and tailor made arrangement according to the local environment. The new method improved the production and quality of the vegetable and fruits substantially. When compared to previous manpower methods, production increased by 15% while the cost of operation decreased. The new method yielded a better quality fruit, as fruits bared from the honeybee-pollinated trees had higher sugar content.

Pinggu County has a basic apiculture industry and a rich resource for fruit production. In 1996, the Science administrator learnt about the honeybee pollination and contacted the Bee broker for technical support on the subject. With the Science administrator's sponsorship, the Bee broker provided training courses and field demonstrations to technical forces in the county. During year 2000, the Science administrator organized beekeepers for the Bee research institute for its "Wall Bee" research project; since then, ties between the Bee research institute and the Beekeepers association have been established. Subsequently, the two partners have jointly carried out pollination service operations in the neighboring Hebei province and have achieved successful results. With more and more research institutions involved in market activities, inspired by economic gain, the Bee research institute decided to commercialize their technology as a service to the institutional and individual farmers. The institute has also obtained a patent protection right for its specially designed pollination equipment.

In 1999, the Bee research institute started its business operation by setting a company called Yong An Xin Bio-pollination Co., Limited (the Bee broker). It was the first of its kind to team-up with biologists and technical workers specializing in honeybee pollination services and distributing some honey related products. The Agricultural department of the Beijing Municipal Government supported the new company with some financial aid for its promotion activities and BAAFS provided laboratory facilities and office space for the Bee broker's business operation.

The business concept as outlined by Mr. Wang Fenghe, the manager of the Bee broker (with background training as a biologist) was to engage a series of activities - ranging from providing honeybee pollination services to farmers and conducting honeybee R&D projects. Along with this, the Bee broker also sourced and distributed some honeybee related nutritional products and green food products (like high quality fruits and vegetables) to certain niche markets.

As the business developed, the Bee broker became increasingly aware of the fact that technology alone was not enough to run the business - as it required other important resources and competences which the Bee broker did not possess; such as a large source of honeybee colonies and capability of large-scale organization and close coordination between the beekeepers and farmers. From his previous experience, Mr. Wang understood the fact that it would be a high cost, high-risk inefficient operation if the Bee broker tried to do the work on its own. Other challenges - such as managing receivables from the farmers - were not easy jobs for the Bee broker either. Support from local collaborators, who were capable of organizing the farmers, were believed to be vital for the business. Consequently, the Bee broker initiated a cooperative arrangement with them.

III. The formation of the Honeybee NW

The Science administrator viewed the proposal of cooperation to be a natural continuation between the scientific research institutions and complementary to its science and technology education activities in Pinggu County. As for the Beekeepers association, it was good news for them – since it spelled out a growth opportunity for its over 100 member beekeepers. Followed by some successful pollination operations jointly conducted in Hebei provinces, the Bee broker and the Beekeepers association were intended to further cooperate in establishing a honeybee reproduction base with a supply of 30,000 honeybee colonies, and a processing plant with a capacity of 2000 tons of honey and 40 tons of royal jelly. The Beekeepers association respected the Bee broker as a scientific institution for its technical influence, and the Bee broker valued the Beekeepers association as a strong base of bee supply with competitive resources, which fitted best in its strategy.

In 1999, Mr. Wang contacted Mr. Xu Changmao, manager of the Township administrator in Yangzhen for support in honeybee pollination research experiments. The Township administrator recognized that activity was beneficial to the local agriculture and helped the Bee broker by organizing farmers to participate in the technical experiments and field demonstrations. The trial results showed excellent quality and high yield production of the treated melons and vegetables. A direct gain of economic benefit of RMB 300-400 per mu was generated for the farmers. To promote the method, the Township administrator also covered the payment to the beekeepers by using Governmental budget funds.

With previous good records of cooperation and relationship between both organizations and individuals, an oral agreement was reached. It was agreed that the Bee broker took responsibility for providing a full package of technical service which included bee colonies and pollinating facilities, while the Township administrator was responsible of providing a free service by organizing vegetable growers for the operation. The support provided to the Bee broker in the honeybee pollination was justified from the Township administrator's point of view because the activity fitted ideally into their administrative duty of promoting agro-scientific activities and creating income-generating opportunities for the local farmers. With the growth of the business size, there was also a potential economic benefit for the Township administrator. The oral agreement based on the trustful relationship between the Township administrator and the Bee broker was considered as adequate for the present stage. However, Mr. Xu believed that with the development of the business some form of standardized contract might be needed to regulate the increased benefit and risk factors involved. Further, in his opinion, the present loosely coupled

cooperative relationship should be developed into a relatively tightly coupled one. Between the Bee broker and the Beekeepers association, a basic written agreement containing conditions which ensured the safety of bee colonies and payment terms etc. were signed each time before the actual execution of pollinating operation. It was also agreed between the partners that the Bee broker would guarantee to periodically provide free training courses and service of newly developed pollinating related techniques, along with training materials (such as demonstrational video tapes) to the Township administrator, the Science administrator, and the Beekeepers association. Consequently, a NW alliance was formed with three partners with whom, the Bee broker have previously collaborated now have sound relationships.

IV. The development phase and NW performance

The Township administrator was more trusted by the local farmers than a pure commercial firm, and hence effectively organized local farmers in using the pollination service while coordinating various conflicts of the farming activities with the pollination operation. For example, it is extremely important to avoid application of pesticide while conducting pollination, because that can be harmful to the honeybees. In such event, the Township administrator could coordinate the activities between the operators for an appropriate arrangement. In addition, farmers were greatly motivated about the benefits of the method by the effective education programs on the local TV channels and video demonstrations at the field level (these were organized jointly by the Bee broker and the Township administrator). The operational process started with the Township administrator first organizing the farmers and gathering requests for pollinating services from them, and then notifying the Bee broker 15-30 days prior to the operation. Upon receiving the notice, the Bee broker started to arrange the specifications of required bee colonies according to the needs of each user with the Beekeepers association. The Beekeepers association prepared and transported the bee colonies, under the Bee broker's coordination, to the fields on-time and placed the honeybee boxes according to the Bee broker's instructions. The farmers who had requested the service were notified by the Township administrator to receive the operation in their field. In case some farmers failed to pay after using the service, the Township administrator played an effective role in settling disputes. At the end of flowering season, the Bee broker returned the bee colonies to the beekeepers at their specified locations. All participants were happy about their cooperation in the NW. The Bee broker had generated profit and further consolidated its R&D activities. Moreover, as a research organization Mr. Wang felt that they have learnt the important role personal relationships played through exchange activities and association with members who had governmental influence and marketing experience. Because of the better quality of their vegetable production output, the Township administrator politically achieved his task by introducing environmental friendly approaches to the local agricultural development and improving the farmer's livelihood. For the Beekeepers association with its beekeepers, apart from the profit, they have also acquired honeybee pollination knowledge, which signified a concrete step in further commercializing this service to the agricultural market.

In Pinggu County, the major economic crop targeted was fruit. At the point of this investigation, the cooperation with the Beekeepers association was mainly in honeybee supply. The Bee broker was in preparation to carry out similar types of activities with the Science administrator as he did with the Township administrator in

Yangzhen. Mr. Chen, the Vice Chairman of the Science administrator, reacted positively to the activity and its future prospects. However, he also felt that the Bee broker's business vision, though somewhat theoretically sound, needed more fine tuning in practice - especially since different conditions need to be met in order to operate in the large area of fruit trees in open air conditions than in the green house practice. More efforts are required to coordinate various relationships at different levels. An example could be that if two or more neighborhood farmers disagreed in having the pollinating operation together, this would thus create a situation where one farmer would pay the service for the fruit trees owned by someone next to his, because of the uncontrolled flight of honeybees. Additionally, other farming activities, such as the application of pesticides, need to be closely coordinated. In this aspect, the Science administrator had an important role to play. The farmers in Pinggu have the lofty goal of supplying green house peaches to the Beijing market and pollination services have been viewed as an important mean for achieving this objective.

To further strengthen its technical leadership position, the Bee broker has designed a special "one time only" honeybee, which had a life span only for two to three months and could not be reproduced. Along with this, the "Wall bee" project was well on the way to market. Based on the experiences of the current cooperation, the Bee broker planned to expand its operation to a national scale.

In general, all partners in the cooperative operation saw each other as indispensable to the other - the Township administrator, the Science administrator and the Beekeepers association respectively believed their own roles were important. Each, however, respected the Bee broker's status as a unit of BAAFS. The Beekeepers association wished to stabilize a long-term cooperative relationship with the Bee broker by extending the business scope into other honeybee related areas in addition to the pollinating business. However, because of the limitations of their respective functions, both the Township administrator and the Science administrator believed that, in the long run, a professional organization with technical and commercial resources could better manage the better job as compared to the Bee broker and themselves.

CASE 3-6: THE COMPOUND FERTILIZER NW

I. The Actors

1) Shanghai Agricultural Means of Production Corp. (the SODE broker)

The SODE broker is a State owned distribution enterprise which specializes in agricultural products and materials such as agrochemicals, fertilizers, field plastic sheet etc. The SODE broker has a total staff of 360 people and controls an operation of 11 subsidiary branch companies and 2 Sino-foreign JV firms in Shanghai. The SODE broker's sales in 2000 reached RMB 1 billion (US\$ 12 million). Since 1963, the SODE broker has dominated the local market with its sprawling network of warehouses and distribution channels. The introduction of a market-based economy has changed the SODE broker's dominance in agrochemical distribution. Besides, the SODE broker is still entrusted by the Government responsible for storing agricultural means and materials for natural disaster relief work in the rural area (a fixed fund is allocated).

2) Shanghai Agricultural Technology Extensions and Service Center – Soil Fertilizer and Environmental Protection Department (the Agro-tech Center)

The Agro-tech Center is a World Bank sponsored project that has 150 agriculture specialists and technicians. The center is a comprehensive institution consisting of departments of agriculture, plant protection, soil-fertilizer, horticulture and so on. The main duties of the center are organizing agricultural technology training, providing agricultural information service, and carrying out experimental demonstrations on identified agricultural technology in the Shanghai region. The center also performs a law enforcement function in quality inspection on pesticide, seeds and fertilizer, and supervises the agricultural environmental protection and plant quarantine operation.

3) Shanghai Academy of Agricultural Science - the Ecological Science Research Institute (the Agro-researcher)

The Agro-researcher is one of the nine research institutes in the Shanghai Academy of Agricultural Science. The main focus of the institute is to research and develop new compound fertilizer and leaf surface nutrient liquid, soil fertilization, water saving irrigation, soil obstacle and improvement, comprehensive treatment and utilization of urban and agricultural waste disposals, monitor and evaluate agricultural ecology, development of green technology and green food. Since 1980, the institute has been responsible for developing 94 research projects (24 items have won provincial and ministry level awards). The research results of special compound fertilizer on vegetable and tobacco and the leaf surface nutrient range products have been widely applied and have demonstrated outstanding performances.

4) Shanghai Research Institute of Chemical Industry – the Phosphate Compound Fertilizer Center (the Chemical engineer)

The Chemical engineer belongs to the Shanghai Research Institute of Chemical Industry. The center has a technical force of 52 people focusing mainly on research and development of process technology and a complete set engineering project of phosphate chemicals and phosphate fertilizer and consultancy services on turnkey projects. The consultancy service includes feasibility study, engineering design, equipment manufacturing, factory installation, commissioning and technical adjustment, training etc. The center has, during the recent years, installed 300 sets of production process of technology of mixed compound phosphate fertilizer (with capacities ranging from 30,000 to 200,000 tons) installed in various provinces. In addition, the Center has also built overseas phosphate fertilizer manufacturing sites in the Philippines, Indonesia and Thailand.

5) Qingshang Chemical (CHINA) Investment Co., Ltd (the Fertilizer producer)

The Fertilizer producer is a Taiwanese invested firm specializing in manufacturing and marketing one of the primary nutrients-sulphate of potash (SOP) with a certification of ISO9002 and ISO14001 standards. From 1994 to 1999, the Fertilizer producer has invested in 15 SOP plants in different regions in China. By reaching a total production of 60,000 metric tons in 2001, the Fertilizer producer makes itself the largest SOP producer in Asia and the third largest in the world. Other activities include manufacturing a basic industrial acids-Hydrochloric Acid (HCL) and trading of sulfuric acid and molten sulfur in Southeast Asia and North America.

II. Background

China's economic reform fostered an increased competition pressure in the country's agrochemical market, the former superior status of the SODE broker, - once the monopoly distributor in the agribusiness sector, has been challenged by manufacturers and other agrochemical players who have gained right of direct access to retailers and users. The SODE broker, as other former central planning players had to fight for their own way to survive economically. To strengthen its market position, the SODE broker actively searches for supply sources of new products such as chemical raw materials, feedstuff and hygiene products. In 1999, the SODE broker developed a computerized distribution system linking 44 grassroots-level supply stations over the 10 counties around Shanghai. At the same time, the SODE broker has initiated a new strategic direction in stabilizing its source of supply of key products. Investing in production assets was one of these steps.

The mixed compound fertilizer was identified by the SODE broker as a promising item because of its advantages of high efficacy and environmental acceptance features. Relatively small exposure, in terms of investment sum for a manufacturing plant, also fit to the strategy of the SODE broker. Since the SODE broker could directly import Potash (an important ingredient for the mixed compound fertilizer which is basically import dependant due to a present natural resource constraints) the product could be formulated more competitively than others could. The SODE broker, however, had core competences mainly in distributing agricultural products; to establish a manufacturing site, the SODE broker needed other important expertise for managing different technical and administrative dimensions associated with the project. Therefore, a decision to cooperate with external parties who have the expertise was made and a JV structure was initially considered a preferred alliance form because the SODE broker has two JV companies with the foreign partners.

III. The formation process of the Compound fertilizer NW

The SODE broker first initiated discussions on the JV cooperation with the Fertilizer producer who is a supplier of SOP to the SODE broker. The Fertilizer producer was considered a suitable production partner for its good management of production activities in many provinces. Likewise, establishing a partnership with the Fertilizer producer would also allow the JV to have a non-SOE status since the Taiwanese firm enjoys preferential treatment from the Government policy. The SODE broker believed that a private partner managing the enterprise would be more efficient than a SOE manager would. Furthermore, the SODE broker also realized that to be successful in the project formation and its future development, other expertise than production management were needed: such as product management and development, sales, marketing and engineering support to its production process. Consequently, the SODE broker enlarged the scope of partners' selection to other resource owners.

In Spring 2000, the SODE broker invited four organizations, the Agro-tech Center, the Agro-researcher, the Chemical engineer, and the Fertilizer producer, to jointly evaluate the project and discuss the possibility of cooperation. The SODE broker had good cooperative experiences with these organizations, and most managers had good personal relations with each other through the local professional circle where the agriculture related professionals often meet on various occasions. The overall responses from the participants were very positive, as all believed that the product had a good market potential, and a competitive market position could be achieved by

combining each of their competences with the SODE broker's strength such as its direct access of potash - an important key cost reducing factor and strong presence in the agrochemical market.

The SODE broker has followed up the matter by proposing a cooperative arrangement to the four potential partners, which was accepted. As a result, on 14 April 2000 all parties signed a letter of intent to form an equity share JV. The SODE broker contributed 50% of the share capital and 40% by the Fertilizer producer. The Agro-tech Center, the Agro-researcher and the Chemical engineer contributed respectively the remaining 10% (3,33% from each). The business scope of the JV Company was to produce and distribute mixed compound fertilizer and other related fertilizer products. The first year production was planned to be 50,000 tons and to increase annually. The parties have clarified their respective responsibilities: the SODE broker's responsibilities were to apply for the Governmental approval of the JV establishment and to obtain a business license, and to allocate land for building the manufacturing site, warehouse, and office facilities. The Fertilizer producer's responsibilities were to prepare the purchase and manufacturing of the required production equipments; the Agro-researcher and the Agro-tech Center's were to carry out trials, technical promotion and field applications of the product; and the Chemical engineer was responsible for the product formulation, quality control and assistance in installing the production equipment.

The JV application was submitted to the authorities in May 2000, but was, however, rejected by the Foreign Economic Relations and Trade Commission of the Shanghai Government because the Agro-researcher, the Chemical engineer and the Agro-tech Center in particular, were not eligible to participate as equity shareholders in economic entities. This issue, nevertheless, did not prevent the partners from further pursuing the subject. Soon after, led by the SODE broker, the partners discussed and unanimously agreed upon a new cooperative arrangement. They changed original JV structure by keeping the SODE broker and the Fertilizer producer as equity share JV partners. The Agro-researcher, the Agro-tech Center, and the Chemical engineer become non-equity shareholding partners with separate agreements between themselves and the JV. Each of them has a seat in the board of directors. The original arrangement of financial commitment, responsibilities, and economic benefits, in relation to the JV Company's short and long-term operation, remained unchanged. Thus, a model of cooperative arrangement consisting of a tight-coupled equity share relationship between the SODE broker and the Fertilizer producer, and a loose-coupled relationship with the Agro-researcher, the Agro-tech Center and the Chemical engineer, was created. On 30 June 2000, the Contract and Articles of Association of the new venture were officially signed between the SODE broker and the Fertilizer producer with the presence of the other three non-equity cooperative partners, the new application was submitted again to the municipal Governmental office for approval.

Due to the oversupply situation of low quality fertilizers, the government, on one hand, closed down the small producers that failed to meet ecological and technical standards, while on the other hand, it also tightened up control over the approval procedure by imposing strict examinations of each new investment proposal to prevent new disqualified projects from being constructed. The control mechanism focused on a set of integrated criterion that challenge the technological advantages and ecological impact of applied product and its manufacturing process. As a routine procedure, the administrator organized project consultation and assessment sessions with the authorized professional organizations in the field seeking for judgment.

The Agro-researcher and the Agro-tech Center were the authorized professional Bodies for judging suitability of agrochemicals and fertilizer to be applied in the field. Their knowledge and close involvement with the project helped to work out a comprehensive assessment on the efficacy and field application of the mixed compound fertilizer as a recommended product. A similar situation existed in the chemical production approval process wherein the Chemical engineer was the authorized assessor and has played an irreplaceable role in evaluating process technology in addition to the ecological standard of the JV project. The process proceeded speedily with green lights from all crucial control points. And on March 2001, the new company received its business license.

IV. The development phase and performance

The data collection process for this case took place in Shanghai during July 2001, just four months after the establishment of the new company. The NW was in its process of implementation as planned. The partners had meetings every two to three months. The SODE broker was preparing for its retailing network for the forthcoming turnout of the product and Mr. Chen Junrong, deputy director of the SODE broker acted as Chairman in the board. The Fertilizer producer had sent Mr. Chen Hecheng to be the GM managing all technical operation; the responsibilities of the Agro-researcher, the Agro-tech Center and the Chemical engineer have remained as ongoing activities which were seen with increasing importance as the product came closer to reaching the market place.

With respect to the short time, there was not much to be seen at this relatively early stage of the development phase. Data obtained from interviewing the key individuals who have been closely involved in the formation and present development process of the new company, expressed more their satisfaction on the cooperation in the formation phase and the present progress made along with a clear confidence towards each partner, since their collective futures could be seen as well. This confidence was reflected from their optimistic view over the growth potential of the business and good relationships among the five partners at both company and individual levels.

It was observed during the interviewing process that, due to the initial operation stage and a relatively small exposure of the investment, the Agro-researcher, the Chemical engineer, and the Agro-tech center showed comparatively less concern about the detail matters of the venture. With a realization of the projected financial return and further internal and external changes to the partners, whether the parties can still maintain their harmony as they were during the formation phase and present stage remains to be seen. In addition, the cultural differences could still be a potential area of conflict since partners have quite different backgrounds and management styles. However, what have been evidently seen so far, giving some positive indications to the future, is that – though there may be problems, with sound relationships and trusting attitudes between the partners, solutions are likely to be found.

CASE 4-6: THE BIOFERTILIZER NW

I. The Actors

1) Shanxi Zhonghe Biofertilizer Limited (the POE broker)

Shanxi Zhonghe Biofertilizer Limited is a privately owned firm manufacturing and marketing of biological bacteria fertilizer (biofertilizer fermented with biotechnology

of nitrogen fixation). Its business activities include R&D and technical consultation on biofertilizer. The company has 210 employees with different professional backgrounds in microorganism, soil chemistry, plantation, horticulture and production. The firm is strategically positioned as an environmental friendly and sustainable agriculture supporter, and its business operation was mainly conducted in the local province.

2) The Science and Technology Bureau of Yichuan County (the Science bureau)

The Science bureau belongs to the Yichuan County Government. The main tasks of the bureau are to manage the local technology information system, promote science and technological development and to encourage local population engaging in scientific activities through organizing training courses and technical exchange. Besides, the bureau also facilitates individuals and institutions in transforming their inventions into productivity. The focus of the bureau is mainly on the agriculture science and technology.

3) Yichuan Science/ Technology Service Center (the Biofertilizer distributor)

Yichuan Science and Technology Service Center (the Biofertilizer distributor) is a small privately owned firm specialized in the agricultural materials of agrochemicals, fertilizers and some agricultural equipment. The owner, Mr. Wu Shiping was a civil servant who worked for many years in the administrative department of Yichuan government and has three years experience as a village head. Mr. Wu developed many personal contacts with people in the local and nearby areas. In 1997, like many former civil servants in China, Mr. Wu left his job and started his own business. He manages a small but profitable distribution business with a turnover of half million RMB.

4) The Shanxi Pomology Research Institute (The Pomology researcher)

The Pomology researcher is an important branch of learning in the Horticulture College of the Northwest Agriculture University. The institute has received many awards for its research contributions from both provincial and national authorities. Currently, the Pomology researcher together with other institutes in the college has undertaken a number of State assignments. The fruits growing organizations and the farmers in Shanxi province have high respects on the institute's renowned academic status in the field of pomology.

II. Background

Yichuan County is 300 km away from Xian. The natural environment of the County is especially suitable for growing apples due to its soil structure, climate and other conditions and, therefore, the Yichuan apple is well known in the province. The POE broker has targeted the County for its biological bacteria fertilizer, which is fermented with biotechnology of nitrogen fixation.

With its headquarters and manufacturing site based in Xian, the POE broker, like many other small firms in the agribusiness sector, operated in a challenging business environment whereby the customers were living in distant and dispersedly situated villages with difficult communications and less developed transportation infrastructures. Small firms had difficulties in marketing their products with their limited resources. However, pressured by the increasingly severe competition in the nearby market, new markets needed to be developed, and cooperation with influential

local parties was believed as the only way out to penetrate the market. In his strategy, Mr. Hao, the owner of the POE broker had initially identified the Pomology Research Institute from Xian as a scientific partner jointly approaching Yichuan county and other fruit growing areas. The POE broker's idea was to associate the biofertilizer with an official scientific image possessed by the State research institution. From both professional and economic angles, the institute agreed to cooperate with the POE broker.

In September 2000, in an exhibition of local science and technological development in the Luochuan County, as a participant, the POE broker presented some exhibits of the biotechnology of nitrogen fixation and its product and activities. The POE broker's exhibits in the show caught attention of a group of visitors from Yichuan County headed by Mr. Liu Xianxing, director of the Science bureau, and they contacted the POE broker's staffs. During the discussions, the POE broker staff promoted their biofertilizer in relation to the apple production for its ecological advantages. Impressed by both organization of the exhibition and the POE broker's presentation, Mr. Liu thought it would be a good idea to organize a similar activity in the Yichuan County, but was a bit concerned about the cost for since his department operated on a tight expenses budget at the time. The POE broker noticed this situation, and made an offer to Mr. Liu that the POE broker would like to assist Yichuan county in organizing an exhibition by contributing the exhibits needed for the show freely and to form a cooperative relationship with the Science bureau in promoting new technology and products in Yichuan county.

With the POE broker's support, an exhibition of science and technological development of Yichuan County was held for a period of six months in the county. Over 30,000 local visitors from all walks of life (the total population of the county was 100,000 people) visited the show. Most of the visitors were impressed by the nicely designed and high quality exhibiting boards contributed by the POE broker. The exhibition was considered a meaningful activity, which reflected a comprehensive picture of the basic scientific and technological activities and achievements in the local environment. Mr. Liu appreciated the supports provided by the POE broker and told his staffs about his intention of further cooperation with the POE broker in promoting its biofertilizer business in the Yichuan County.

The initial cooperative arrangement, concerning biofertilizer, was that the Science bureau via one of its subsidiary units legally entitled for conducting business, acted as an agent for the POE broker for the Yichuan market. The POE broker offered the Science bureau a favorable supply price to allow the Science bureau earning a margin out from the activity. However, the arrangement did not work out. The Science bureau was effective with its local influence and capabilities in organizing village officials and farmers for participating in field trials and demonstration activities. However, running a business operation which involves a series of activities such as logistics, financing, distribution and receivable management was not the primary strength of the civil servants. Mr. Liu tried hard to push the sales, to the extent, that he allocated a sales quota of 10 tons of product to each staff, and nevertheless, little sales were made. The result was disappointing. At this stage, both partners believed that a specialized local distributor would do a better job than the Science bureau.

III. The formation process of the Biofertilizer NW

Mr. Liu realized that the situation could not continue as the initial arrangement. He discussed the matter with Mr. Wu Shiping. He showed enthusiasm in participating in the cooperation, since he was well aware of the trend that application of ecological friendly product on the local apple trees were increasingly demanded by the fruits market. On the other hand, he was also concerned about the declining margin of chemical fertilizers. Searching for new items in the plant nutrient sector had already been in his mind for some time. The POE broker welcomed the idea, for they appreciated the value-adding role of a down stream operator such as the Biofertilizer distributor. Consequently, a rearranged model of cooperation, as formulated by Mr. Hao: **“Supplier + Government + Distributor + farmers”** was formed according to each partner’s competence and their complementary interests. According to the cooperative arrangement, the POE broker was responsible of supplying the product and providing technical service to the Biofertilizer distributor. The Biofertilizer distributor carried stocks and distributed the products through its local outlets and channels at the field and was responsible of collecting money - a very challenging task in the agribusiness at retail level. The Science bureau incorporated the promotion activities of the biotechnology of nitrogen fixation and the POE broker’s product into its administrative task of promoting advanced technology and products to the local farmers. As an appreciation for its support, the POE broker would compensate the Science bureau with a percentage of commission from the sales generated. There were no written agreements signed among the partners, although Mr. Wu asked Mr. Zhang Feng (manager of the POE broker for Yichuan business) if he was of the opinion that a written contract between them was necessary. Mr. Zhang responded that they would do it later and assured Mr. Wu orally that the Biofertilizer distributor was the only partner in the Yichuan County to play the role of distributor. From the Science bureau’s point of view, Mr. Liu believed that, for the time being, a gentleman’s agreement was good enough; however with the business having developed to a certain stage, a long-term contract could be necessary.

IV. The development phase and NW performance

The first step of the joint operation was to create a strong awareness of the product by carrying out effective field promotion activities. The POE broker provided some funds which were used for a well-prepared promotional campaign highlighted by product logos on big trucks with colorful banners, a video show of technical demonstrations and product leaflets etc. The Biofertilizer distributor brought 12 tons of sample product as standby stock for supply. The Science bureau assigned the task of providing training courses on the topic of “scientific management of fruit trees” to the officials at the Township and village levels – who also organized farmers’ rallies according to the specific date and venue. In the promotion rallies chaired by the Science bureau staffs, the POE broker made presentations on the subjects of market trend of apples, challenges and solutions; the evolution process of ecological and sustainable agriculture; differences between biological and chemical solutions; and application method. At the same time, the appointed channels of product were introduced and printing materials were distributed. Following the presentation, the Biofertilizer distributor started to make arrangement of order collection, distribution plan and followed up with supply procedures with the POE broker. The three partners had jointly conducted such activities in nine out of ten towns which covered more than 100 villages in the Yichuan County. The joint efforts of promotion paid off in that farmers reacted to the product soon with purchases. The POE broker as the first

biofertilizer supplier successfully entered into the Yichuan market in a relatively short period of time.

Seeing the positive development of the cooperation, some staffs from the Science bureau felt regret for not being able to continue the business by themselves. They complained to Mr. Liu about having given the moneymaking opportunity to the Biofertilizer distributor. Mr. Liu explained to the staff that the Science bureau was not an appropriate player for the operation. However to balance the potential conflicts, an arrangement was made by the POE broker that in case firm orders were placed by the Science bureau people, same price which the Biofertilizer distributor got from the POE broker would be offered to the Science bureau, however, they would have to get the products from the Biofertilizer distributor's warehouse. Other issues were that some retired employees of the Science bureau also introduced other sources of biotech-based fertilizer; they asked Mr. Liu to provide them with the same support as he did to the POE broker. Mr. Liu emphasized that the relationship with the POE broker was built from an early cooperation of science exhibitions and good quality products, and therefore refused to support competitive activities against the POE broker.

Mr. Wu, the Biofertilizer distributor, was confident about his solidly built customer base in the Yichuan County. However he was still concerned about the long-term sustainability of the product efficacy and stability of relationship with the POE broker. He strongly believed that with further market development, a long-term distribution contract including clauses of guarantee on product quality and exclusive distribution right for Yichuan County (and plus two to three neighboring counties) should be signed between the POE broker and his firm.

The POE broker appreciated the roles played by the local partners in the present cooperation. Mr. Zhang Feng the marketing manager visited and stayed in Yichuan County regularly. Mr. Hao, too, often visited the two partners personally and vice versa. The relationships were even extended to their families. The partners all felt that a good communication and friendship existed among them. The POE broker was satisfied with the beginning of its operation in the Yichuan County for the successful results achieved. While continuing to consolidate the Yichuan market, the POE broker also actively prepared to conduct similar activities in other nearby territories. The Science bureau and the Biofertilizer distributor also had the same idea of expanding the activities in the neighboring counties where they have contacts.

CASE 5-6: THE AMMONIA NW

I. The Actors

1) Shanghai ZhongYuan Chemical Co., Limited (the SOIE broker)

Shanghai ZhongYuan Chemical Co., Limited is a state owned enterprise, manufacturing and supplying different chemical products and fertilizers. The company has total assets of 2.2 billion RMB. The main body of the SOIE broker consists of a calcium plant, an Oxygen Plant and Wusong Fertilizer Plant. In addition, it has 15 subsidiary units: out of which, 6 were fertilizer plants located in the rural counties of Shanghai (see below 2-7). The main product lines of the SOIE broker

were separation series (including oxygen and nitrogen etc.), calcium carbide series (acetylene, butyl alcohol etc.), fertilizer and synthetic ammonia series (see below 2-7), phosgene series (dimethyl carbonate), sodium carbonate series, cuprocupric cyanide and magnesium oxide. A leadership position in technology and quality of its main product line has been achieved in the domestic market. The SOIE broker also exports some of its products to the Southeast Asian and European countries. For the past several years, the SOIE broker has been actively restructuring its assets with an objective of optimizing their resources in developing new technologies and products in the areas of basic chemical raw material, agrochemicals, and fine chemicals.

2) Qingpu chemical plant, 3) Fengxian fertilizer Plant, 4) Nanhui chemical plant, 5) Chongming fertilizer Plant, 6) Chuansha Chemical Plant, and 7) Pudong chemical Plant

The six fertilizer plants are subsidiaries of Shanghai ZhongYuan Chemical Co., Limited located in the respective rural counties around Shanghai. Each of them employed a work force from 600 to 1,000 people and produced 8,000 to 10,000 tons of synthetic ammonia with 99.8% content, and Nitric acid with 45%; 68%; 98.2% contents, ammonium bicarbonate and D-Sorbitol etc. By 1990s, the production output of each plant raised to a volume of 40,000 to 60,000 tons. The six fertilizer plants are commonly characterized by their outdated technology and products produced.

8) Shanghai Agricultural Means and Production Corp (the SODE distributor) see introduction in the Compound NW case.

II. Background:

During the 1950s, in order to meet the fertilizer demand of the agricultural development in various farming regions, one of the strategies used by the central authorities of China's Agriculture and Chemical industries was to build up many small-scale synthetic ammonia fertilizer plants which used low cost and abundant coal resource as raw material. Numerous small chemical plants were built up throughout the country. This strategy contributed to the development of Chinese agriculture during the early days. Around Shanghai area, 10 such plants belong to the SOIE broker. However, with the development of large-scale industrialization of Urea derived from the petrol natural gas, increased importation of high concentration compound fertilizer and supplies of some large Sino-foreign JVs, and the demand for synthetic ammonia dropped substantially to a level of 250,000 tons. While the production capacity of the outdated synthetic fertilizer plants in Shanghai was more than 500,000 tons. Also, the size of farming land in the Shanghai region shrunk by 5% each year due to rapid industrialization and real estate business expansion.

The SOIE broker has been actively restructuring its assets with an objective of optimizing resources and at the same time - developing new technologies and products in the areas of basic chemical raw material, agrochemicals and fine chemicals. The fertilizer sector was strategically determined to be phased out because of its low economic performance and grim prospects. However, to avoid social problems of substantial job loss, the process was managed with great care. The Shanghai government has provided a three-year financial aid package to the fertilizer plants in supporting their organizational reform (RMB 20 million for the first year, RMB 12 million second year and RMB 9 million for the third year). As a result of this process, the SOIE broker has managed to close down three plants with the most awful surrounding situations, but the total supply capacity of the remaining six plants was

still too high to be consumed by the local market. To adjust the production volume to an appropriate level, it was decided to further close down three plants by diversifying them into different business thus, to bring the remaining plants to healthy tracks.

The Fertilizer business was characterized by its seasonal factor between production and field application. Under the central planning system, the State distributors used a special fund to finance the whole process from raw material purchase, production, and distribution to the field application. The plants were only responsible of producing the output according to the plan assigned without involving any sales or marketing activities. With introduction of the economic reform, this practice was no longer entertained. The State Council document No. 39, 1998, abolished the central planning purchase and supply system and granted the enterprises with autonomy of selling their products directly to the market, but also withdrew the State financial support as was practiced previously. As a result, the inventory-financing burden was completely shouldered by the plants themselves. Banking system reform brought good news in terms of providing support to those well-performed enterprises or the ones with prosperous potentiality, but not for these fertilizer plants - for the obvious reasons. Further, farmers have also changed their previous habits of keeping stocks at their farms. Instead, they only purchase products at the time of application, since the product availability is ensured by the great varieties of competing items fully loaded on the shop shelves. Under such circumstances, the plants tried everything possible to get the products sold. Severe price wars and dumping activities among the plants coupled with high raw material price further worsened the situation. Confronted by this chaotic situation, the SOIE broker had to find ways of balancing among its fertilizer plant's activities in relation to the purchase of raw materials and supply to the local market. However, simply integrating the plants into a central system was not believed as a viable solution for the reason that these plants although were under the SOIE broker's control. Each had their independent legal personal status and dual administrative relationships with the local County government. Therefore, a new structural arrangement that could accommodate the different relationships, while also contributing to the strategic direction set by the SOIE broker, was initiated.

III. The formation of the Ammonia fertilizer NW

In January 16, 1999, the SOIE broker created a fertilizer marketing company- the ZhongYuan Fertilizer Marketing Co. Limited or the Marketing Center consisting of the six fertilizer manufacturers. The objective of the new organization was to create a unified supply position in the region to stop the disorderly competition among the members by standardizing their operation and coordinating the relationships into a cooperative form of sharing resources. Externally, the Market Center was to coordinate relationships between the members and distributors for better supply and demand ties. Other important roles of the Marketing Center included lobbying favorable policy and treatment for the members from the Municipal Government.

The new company was financially structured as: the SOIE broker invested 80% of the registered capital and the rest 20% of the equity share were divided into 4% each separately contributed by Nanhui, Fengxian, Chongming, Chuansha, Pudong and Qingpu. Each partner has one representative on the board, with the Chairman of the board and the GM appointed by the SOIE broker. The plant managers were also concerned about the loose-loose competition between them, although some individuals had different thoughts in mind too. The plants with weaker situations

hoped to benefit from the new venture, but most of the managers merely followed the decision made by the superior organization. The external stakeholders (such as the distributor and raw material suppliers) also showed positive sign to this initiative for that their interests were adversely affected by the chaotic situation as well.

IV. The development phase and performance of the Ammonia NW

The operation began successfully in 1999. The coordinated activities led by the Marketing Center in the first half of the year fully hit the season target. June is a time of particular intensified fertilization, resulting from the recent change of growing single season rice from the previous two-season rice. By internally coordinating the marketing activities of the member plants, and with the distributors in the material flow management externally, selling price position was recaptured from RMB 400 per ton to a level of RMB 470 per ton. From the local Government, a subsidy of one third of the market price on electricity was granted to the Marketing Center as a support to the new organization's role of stabilizing the fertilizer market in the region. Regular meetings to exchange market information and productivity improvement experience along with business coordination among plant managers were organized by the Marketing Center each time in a different member plant.

The new farming practice of growing single season rice has also led to a sharp reduction in fertilizer application just after July and the SODE distributor did not want to keep stocks for the remaining six months. Reemergence of disorderly competitive activities by some plants were found again. The remaining oversupply problem in the local market and shortage of inventory financing in the plants created difficulties for the Marketing Center in its development process.

The SODE distributor, on one hand, wished to have a long-term relationship with the Marketing Center as a stable supply source, but on the other hand, had little confidence on the Marketing Center's ability in refraining its members from selling products directly to the AMPCs in the same county (from the county AMPC's point of view, the Shanghai based SODE distributor is an unnecessary intermediary in the process of fertilizer transaction that takes place at the local level). The power in the SODE distributor's hand was that it still enjoyed special State funding (a special fund for disaster relief agriculture materials) - which was instrumental to the producers' inventory operation. In any case, this required the Marketing Center's efforts in particular to ensure its members respect the overall agreement and effective coordination with the SODE distributor. Mr. Liu spent considerable time in developing relationships with the plant managers and stakeholders. After analyzing various issues, some actions were taken. The Marketing Center proposed a cooperative arrangement with the SODE distributor for an exclusive distribution of 250,000 tons of fertilizer for the region and in exchange, the SODE distributor was expected to provide a loan equivalent to 60% of the financial needs of the plants for covering their inventories. In the proposal, the SODE distributor was asked to work together with the Marketing Center in coordination with the market price and supplying the plan on a regular basis. In addition to the exclusivity, the SODE distributor also was offered a kickback on each settlement. Under this agreement, the SODE distributor was asked to refrain from importing fertilizer from suppliers outside the region. On fulfillment of the allocated volume supplying to the SODE distributor, members of the Marketing Center had the freedom to sell their remaining capacity to distributors outside the region. In response to this, the SODE distributor requested to select specific plants which he considered as reliable suppliers in terms of quality and

service. Correspondingly, the Ammonia NW members also had the freedom of choosing to be, or not to be the supplier to the SODE distributor. In either case, however, the members were not allowed to sell their products within the territory of the region and to respect the general agreement between the Marketing Center and the SODE distributor. In this arrangement, the Marketing Center's role was to coordinate the activities between its member plants with the SODE distributor and to ensure that all members honored the agreement. For this purpose, each member was requested by the Marketing Center to sign a separate legal binding operational agreement with the SODE distributor in addition to the main cooperative agreement at the Marketing Center's level. So far, four members have signed such agreement. The Marketing Center also tried to develop market outside Shanghai for the remaining capacity.

Internally, the Marketing Center tried to centralize functions such as marketing research and information management, raw material purchase (to gain stronger bargaining power with suppliers) and training. To bring down the production volume to an appropriate level, the Marketing Center swapped a capacity of 50,000 tons of fertilizers to produce a different material for the corporate broker. Furthermore, efforts were made in new product and business development. Mr. Liu and his platform team also provided service to the members in terms of introducing customers, providing commercial guarantee for bank credit borrowing, and business consultation. But despite all of the efforts, since the oversupply problem remained the problems of internal competition between the members continued..

For Mr. Liu, the major challenge was to bring together all members to follow and implement company decisions. He explained that due to longstanding practice of the central planning system, plant managers got used to regard their influence in the business activities with other firms as a kind of personal privilege, and therefore, were reluctant in giving up this privilege and to perform as a production unit only. For the same reason, some members purchased raw materials from different channels than the central purchasing channels arranged by the Marketing Center. Besides, the GM also felt that the Marketing Center's selling ability was questioned by the individual plants. Some plant managers resented the arrangement of sharing the Marketing Center's expenses. The extreme behavior reflected by the Qingpu Chemical Plant whose manager was of an opinion that the formation of the Marketing Center was a result of top down administrative order from the SOIE broker that ignored the different characteristics of each fertilizer plants. He further considered the Marketing Center an ineffective form and a cost center. Qingpu even asked permission to leave the Marketing Center and refused to inject their share of capital. Furthermore, some members have problems to trust each other. The plant managers all knew that more closures were under way and no one wished that this would happen to his plant during his term as manager. To survive, members continued to break rules and compete internally.

The GM and the plant managers interviewed felt that, in addition to the problems of their outdated product and oversupplied market, the primary cause and obstacle to change the situation was the SOE system - which had fundamentally restricted the initiatives of the enterprises and individuals. The Marketing Center was not empowered to discipline the wrong doings of the members who broke the company rules. Other complaints showed that the SOE's compensation system was blamed for its lack of incentives. It was believed that the only way out was to further and thoroughly reform the organization. Mr. Zhou, Chairman of the group clearly

indicated that coming steps of the reform (in the preparation) would be focusing on the ownership structure and company systems.

CASE 6-6: THE AGROCHEMICALS NW

I. The Actors

1) The Ministry of Chemical Industry of China (MCI)

MCI – the Ministry of Chemical Industry, was the ministry responsible for the administration and development of China's national chemical industry. MCI governed national production plans of the amount of chemical products to be produced based on projected needs through its departments in Beijing and branch offices at provincial, municipality, district, and county levels. MCI was restructured into several large chemical conglomerates in 1996. The administrative function was assumed by the Department of Chemical Industry as one of the industrial administrators under the Ministry of Foreign Trade and Economic Co-operation (MOFTEC). In the Agrochemicals NW case, MCI was the strategic designer and decision maker at the central level, while the provincial level of chemical industrial administrator—the State broker carried out the implementation task of formation of the Agrochemicals NW.

2) The Shanghai Bureau of Chemical Industry - SBCI (the State broker)

SBCI – the Shanghai Bureau of Chemical Industry, with its organization structure and functional responsibility mirrored MCI's, functioned as an administrator for the state owned chemical industry in Shanghai. SBCI had total assets of RMB11.5 billion (US\$ 1.7 billion) and a work force of 130,000 people. Enterprises under SBCI's administration included large chemical groups manufacturing and supplying wide range of chemical raw material, plastic, pesticide, dyestuff, pigments, rubber products, fertilizer, chemical equipment, chemical solvents and coal chemical products etc. As one of the important chemical industrial bases in China, SBCI cooperated with nearly all the major multinationals in the world chemical industrial arena. In addition to the substantial export business, the enterprises under SBCI had also invested in overseas market. In 1998, with MCI's overall restructuring, SBCI has been transformed into a large industrial holding group – Shanghai Huayi Group. In the Agrochemicals NW case, SBCI (the State broker) played a key role between the MCI, different ministries and commissions at central level, the local Shanghai municipality and the four units for the formation of the Agrochemicals NW.

3) Shanghai Pesticide Factory – SPF (the Insecticide producer)

SPF was founded in the late 1950s with a work force of 1,200 people. The Insecticide producer specialized in manufacturing more than 50 different pesticides (mainly organic phosphate based insecticides), chemical products and dyestuff intermediates - with sales of around RMB120 million. The Insecticide producer was well equipped: with a laboratory center, efficacy lab, and independent pre-production experimental facilities.

4) Union Chemical Factory – UCF (the Herbicide producer)

The Herbicide producer had a work force of 1,400 people and specialized in formulating herbicides with sales of RMB80million. After the Agrochemicals NW

dissolved, the Herbicide producer went bankrupt in 2000. Now the new enterprise has been renamed as Shanghai ShenLiang Chemical Factory.

5) Dongfeng Pesticide Factory – DPF (the Fungicide producer)

The Fungicide producer employed 500 people. The main manufacturing activity was to produce fungicide that generated sales of RMB80 million.

6) Shanghai Pesticide Research Institute – SPRI (the Pesticide researcher)

The institute had 37 years history in research of chemical pesticide, bio-pesticide and some fine chemicals. Its research area covered microbiology, toxicology, agriculture, pharmaceutical, animal husbandry, ecology and other cross research fields. The Pesticide researcher employed 256 individuals and had fulfilled 150 State research projects and developed more than 70 different kinds of pesticides and 20 chemical intermediates produced in 50 manufacturers in various regions in China. The institute also has 14 domestic and international patents. The institute had long-term cooperative relationships with more than 50 research institutions in China and abroad.

II. Background

MCI adopted a two-phase strategy for developing the country's agrochemical industry. The emphasis of phase one was mainly on imitating, modifying, and improving foreign generic technology in production and formulation of pesticide. This strategy contributed greatly to the agriculture development in China from the 1950s to 1980s. However, this also resulted in a negative dimension characterized by overlapping manufacturing activities with most of the outdated technologies and over supply of low efficacy and high toxicity products. Particularly with the overall development of China's economy reaching a significant level in the 1990s, demand for agrochemical products with both high efficacy and environmental acceptance standards have pressurized the industry to undergo a fundamental restructuring. The other issue was that, due to insufficient investment, small and fragmented industrial scale, the agrochemical industry was limited by less varieties and weak ability of synthetic production. After signing the Memorandum of Understanding on Intellectual Property Protection between the Chinese and US governments in January 1992, the need to move into **a new strategic phase of developing the industry's synthesis research capabilities** called for urgent action and became a top priority in the MCI's agenda. As a part of this changing process, China revised its patent law with the objectives of meeting international common practice. The State Council requested MCI to strategically restructure the agrochemical industry by establishing two major synthesis research centers separately located in the North and South of China. This decision represented one of the major strategic steps for China's agrochemical industry; it marked the beginning of a concrete transformation from an imitating production oriented industry to a synthetic production oriented one. The State department requested that the new research centers to be integrated into enterprises. The strategic importance of the move was widely recognized in the industry by both domestic firms and top multinational companies. This decision attracted a big competition amongst the MCI branch offices in many provinces for that all wished to have the project (with the central allocation of fund) in their own province. Shanghai was favored by MCI because of its strategic advantages, good geographical location, easy access to raw materials, convenient transportation to both domestic and export markets, and the industrial infrastructure. Another important point was that the three complementarily configured agrochemical factories and one advanced pesticide research institution, all

located within one city, made coordinating various relationships easier by putting them under a single local administrative body. This decision was obviously welcomed by the SBCI, which had actively pursued the project.

III. The formation of the Agrochemical NW

With the above background, MCI and SBCI have initiated the formation of an agrochemical conglomerate by integrating the three state owned agrochemical companies and one pesticide research institute in Shanghai. The new group was named by MCI as Asian Pacific Agricultural Chemical Group (APACG). The new group was a SOE, with each partner as a shareholder, whose assets were controlled by SBCI. The group was expected to deal not only with the outside market but also to interact with each other through existing internal markets amongst the members (such as toll production, transfer technology etc.). From the point of views of resource distribution and product structure, a considerable synergism existed between the four partners. For example, SPF specialized mainly in producing insecticide, SUCF mainly in herbicide formulation and, had spare capacity from its formulation facilities and DFPF was a base for producing fungicide due to its ownership of phosgene facilities (phosgene is a chemical ingredient that could not be transported due to safety reason). SPRI focused on research and development of new agrochemical compounds for the group's product pipeline. The new company's business portfolio was both comprehensive in product range and complementary in resource combination. The main business scope was on the production and distribution of pesticides, environmental hygiene products, and chemical intermediate for pesticides. The secondary scope was production and distribution of other chemical products, patent transfer, and technical service, training and consulting, compensation trade and toll production assignment.

The formation of the new group, in connection to the establishment of the South Synthesis Research Center, gained strong support from the relevant central governmental departments. The State Council planned to support the center with a capital of US\$60 million to US\$120 million. To generate additional financial resources, the central authorities have also granted the new group special rights for being listed on the public stock exchange market as a capital source of R&D and production development. At the request of MCI and SBCI, the Shanghai Municipal Government also granted the new group a status enjoying all preferential treatment normally entitled only to firms registered in the Pudong area.²⁹ With all the unique supports, the single largest of its kind at the time in the Chinese agrochemical industry, Asian Pacific Agrochemical (Group) Company was smoothly formed in only 6 months. The inauguration of the new group took place in Shanghai on 10th June 1992, with an official speech delivered by the vice minister of MCI and the presence of many leading figures from various and concerned central and local government departments.

SBCI appointed the management team members for the new group. The former GM of SPF Mr. Lang became the President. The former GMs of UCF, DFPF and SPRI were appointed as the deputy director responsible for the group sales, marketing and raw material procurement (Mr. Lu), deputy director responsible for the group

²⁹ Pudong is the biggest economic and technological development zone in Shanghai. Firms invested in the zone enjoy special treatments and favorable governmental policies.

production (Mr. Gao) and deputy director responsible for the group technology development (Mr. Guo) respectively.

APACG was structured into four levels of relationships: (1) the core level - the parent group formed by the four partners. All production and business units belonged to the core level were non legal person enterprises with their activities such as finance, assets and property management, purchase, production, supply, taxation, credit loan arrangement, and so on – all under the core level's general administration. The group was the sole body to deal with all external relationships. (2) Close level - the enterprises that were wholly or majority owned by APACG. (3) Semi close level - enterprises with APACG's equity participation, enterprises with independent legal persons status. (4) Loose level - the relevant enterprises with contractual or stable cooperative relationship with the new group.

IV. The development phase and performance of the NW

Entering into the operational phase, the APACG (under the directives of MCI and the SBCI) focused its initial operations on the areas of:

- Reforming the old management style and organizational structure, transforming the operational mechanism and practice shareholder system which holds the group not only responsible to the State but also to the employees, shareholders and stockholders.
- Developing relationships with the agrochemical enterprises and research institutes in the neighborhood Jiangsu, Hunan, Anhui provinces for joint R&D and synthesis operation.
- Attracting technical talents and establishing cooperative relationships with universities and research institutions, along with cooperating with private sector enterprises.
- Activating international cooperation and exchange, facilitating scientists in participating in international research activities, and cooperating with multinational firms and agrochemical research institutions in joint R&D projects and import technology and talents from abroad.

Despite the importance of the above tasks, and contrary to the expectation of all, the new group showed a very disappointing picture soon after it had entered into the operational phase. Many hidden problems - both subjective and objective factors of non-cooperative, and potential conflicts of interests amongst the partners which were less obvious during the time of formation, however, were soon unveiled. There were complicated relationships between the key members of the management team during previous times. Mistrust was the major problem between the partners. According to one former deputy manager, "the partners were always suspicious to each other." For example, DFPF constantly worried about being swallowed by SPF even before the formation of the group. Non-cooperative behaviors amongst the partners have increasingly appeared. For instance as the SPF, instead of unitizing the internal resource of UCF's idle capacity facilities, redundantly invested a new 2,000-ton capacity herbicide production line in its plant. DFPF should have formulated its active ingredients in UCF's facilities according to company arrangement; however, without any internal coordination, DFPF has outsourced the formulation work to the neighborhood Jiangsu province. The group had clear rules requesting all members to obtain permission from the group before engaging in this type of activities, but without actual enforcement in reality.

The non-cooperation between the group business units was largely due to the attitude of the leading personnel in the group management team for that there were specific historical relationships and individual feelings. Most of the leading members did not want to give away their production power, supply distribution (and so on) in the unit where they were formerly in charge. Further more, there were resents and complaints about the appointment of the president. Small coalitions were formed between individuals within the management team. Facing this situation, however, the President did little in handling the politics and conflicts between the key managerial members. According to him, he was inadequately empowered for handling senior personnel issues in the core management team under the SOE's system. And since the group components have been always under SBCI's administration before and after the formation, each member of the management team had past and present ties with the different leading Figures in SBCI. As one informant put it: "before you could officially report anything about a specific person's problem, he probably already sat down in the home of an important leader of SBCI..." The company rules and regulations were, in fact, useless. For the SBCI, to even discipline senior managers with a position of deputy director in the new group, it has to seek authority from the municipality.

The SPRI, or the Pesticide researcher, was the only state owned research organization in the group. The institute had the responsibility to transfer its research result to the general industry. At the time of joining the APACG, an arrangement was made that the APACG was entitled a privilege of getting access to SPRI's new research results in both priority and financial terms - under the condition that the group should confirm acceptance of the transferred substance within three months and arrange for production within one year (technology storage was not allowed). Because of APACG's failure in paying a technology transfer fee, some new technologies were transferred to the agrochemical firms outside the group. SPRI as a state sponsored scientific research institution, received regularly substantial amount of fund from the State, while the new company could not provide the same treatment to SPRI, neither have the ability of developing all the new technologies and paying the technology transfer fees as required. Under such circumstance, SPRI with approval from the municipal government and SBCI, only three months after the group's formation, left APACG and resumed its original independent status. In October 1992, The State Science Commission took over the Pesticide Synthesis Research Centers project and decided to establish the South Synthesis Research Center instead of embedding in APACG as originally planned, but on a four-base structure separately located in Shanghai, Zhejiang, Jiangsu and Hunan.³⁰ A fund of RMB25 million was distributed accordingly. With this change at the central level, the broker - SBCI became less enthusiastic than before about APACG since a long pursued fund was no longer available.

With a situation that no partner in the management team respected the authority of the President, increasing coalition activities and mistrust feelings between the key managers led to a dysfunctional management of the company and eventually the business operation were adversely affected. These internal problems were further worsened by a depressed market condition for the agrochemical industry in 1995. To

³⁰ The South Synthesis Research Center was successfully established in a four base structure, separately located in Shanghai, Jiangsu, Zhejiang and Hunan

face the reality, SBCI resumed an original independent accounting system for each unit as it was practiced before the formation. Up to this stage, the strategic vision and operational essence of APACG had nothing left. The President and other two deputy directors have left the group. In 1996 the new group, at last, was taken over by another pharmaceutical group. Hence, APACG - a once widely believed “pioneer” project shouldering the mission of implementing one of the national industry’s strategic steps sadly closed its chapter.

Appendix II: The Interview questionnaire

The questionnaire has been structured with three contextual sectors along the network building process - 1) Formation context, 2) Development context and 3) Performance context.

Three interview guides were developed, respectively, for the brokers (60 questions)³¹; the stakeholders³² - (62 questions), and the members or partners (58 questions). The three guides have a similar pattern, in general, but with different questions and questioning angle structured/ adapted to the different interviewees. In the case of an actor who directly plays the broker's role throughout the formation and development process, the interview guide for the broker is used. (The original questionnaire collected back from the informants were filed together with other data and evidences collected for this research).

The interview guide handed to the informants was in both Chinese and English versions.

SEMI-STRUCTURED INTERVIEW GUIDE (Broker, stakeholder, member)
1. CLARIFICATION
▪ INTERVIEW PURPOSE - RESEARCH ▪ INTERVIEW DURATION: ABOUT 2 HOUR 30 MINUTES ▪ ALL INFORMATION WILL BE TREATED CONFIDENTIALLY ▪ THE NAMES (OF PERSONS AND FIRMS) WILL REMAIN ANONYMOUS, IF REQUESTED BY THE INFORMANT ▪ THE RESULT WILL BE SENT TO THE INFORMANT BEFORE ANY PUBLICATION IN ORDER TO OBTAIN THEIR APPROVAL
2. GENERAL INFORMATION
▪ THE ORGANIZATION NAME: ▪ DATE /PLACE OF INTERVIEW: ▪ PERSON INTERVIEWED ▪ POSITION ▪ ROLE IN THE COOPERATIVE ARRANGEMENT (ORGANIZATION/ACTIVITY) ▪ SIGNATURE OF THE INFORMANT

³¹ Including the managers from the broker's organization who operationally manage the current network activities

³² Stakeholders mean: shareholders, parent firms, customers, suppliers, distributors, research institutions, financial institutions and relevant government departments

I. FORMATION CONTEXT

Environment

1. When was this cooperative arrangement (organization/activity) formed and during which stage of the process have you been involved in?

Objectives

2. Which of the following factors motivated you to form/join this cooperative arrangement (organization/activity)?

Please rate according to the following scale:

(1= the most important factor /2= important factor /3= neutral /4= less important factor 5= not important factor)

· Responding to a growth opportunity	1 2 3 4 5
· Reducing market uncertainty to your business	1 2 3 4 5
· Improving product quality	1 2 3 4 5
· A step towards diversification/expansion	1 2 3 4 5
· A chance to survive	1 2 3 4 5
· Sharing R&D, HR, marketing costs and expenses with partners	1 2 3 4 5
· Sharing information	1 2 3 4 5
· Sharing a license for producing, distributing a particular product/activity	1 2 3 4 5
· Gaining market share position	1 2 3 4 5
· Gaining a stronger purchasing position	1 2 3 4 5
· Gaining a stronger price increasing position	1 2 3 4 5
· Access financial resources	1 2 3 4 5
· Access technology from the partnership	1 2 3 4 5
· Access new sale or export channels	1 2 3 4 5
· Ecological pressure	1 2 3 4 5
· Decision of the superior/required by the government or State owner	1 2 3 4 5
· Gaining organizational flexibility through changing ownership structure	1 2 3 4 5
· Other unlisted motives	

Actors, activities (similarity and complementarity of combined activities), roles, environment, evolution process, cooperative and competitive behavior

3. Which person/firm was the initiator (the first to have the idea) of this cooperative arrangement, and how the idea of forming this cooperative arrangement was born and how was it developed into a concrete plan/action?
4. How was the idea presented/communicated to the stakeholders? What was the reaction? How was it followed up and by whom? Was the initial idea changed or modified after presented to the stakeholders and potential partner, if yes, what have been changed and why?
5. What assistance or supports have been provided by the external individuals/ organizations/ government agents in connection to the formation of this cooperative arrangement?
6. How did you consider the following factors in determining the suitability of a particular potential partner?

Please rate according to the following scale:

(1= the most important factor /2= important factor /3= neutral /4= less important factor 5= not important factor)

· Track record of good cooperation with others	1 2 3 4 5
· Business relationship with your firm	1 2 3 4 5
· Personal relationships with the owners/key managers	1 2 3 4 5
· Possession of key resources required	1 2 3 4 5
· Capable management team	1 2 3 4 5
· Synergy in the same business field	1 2 3 4 5
· Financial strength	1 2 3 4 5
· Non competitor	1 2 3 4 5
· Unlikely becoming a future competitor	1 2 3 4 5
· Compatible company culture	1 2 3 4 5

Please add other unlisted factors/ criterion

7. Was different ownership of partner firms a problem for forming and participating (in) this cooperative arrangement? If yes, why?
8. Were the potential partners known to each other? Were some of them previously cooperating or competing to each other? How were they put together for a new common strategic objective and by whom?
9. Why did/did not the cooperation arrangement (organization/activity) include a (or several) foreign partner (s)?
10. Which of the following challenges have you faced causing problems for the formation of this cooperative arrangement? How did you overcome them?
 - 1) Determining a good business opportunity
 - 2) Work out a solid business plan and proposal
 - 3) Identifying suitable potential partners
 - 4) Gaining support from the parent organization
 - 5) Convincing potential partners to join the cooperative arrangement
 - 6) Regulatory barriers (e.g. business license, ecological requirement)
 - 7) Financial resource constrains
 - 8) Size of the firm
 - 9) Personal relationship/contact to the key stakeholders
 - 10) Some potential partners have doubt about the feasibility of the project (e.g. market acceptance, technological and managerial requirement etc.)
 - 11) Some potential partners have lack of confidence on your ability to leverage the projected opportunity
 - 12) Some potential partners did not trust you
 - 13) Some potential partners did not trust or dislike other partners in the cooperative arrangement
 - 14) Conflicts of interests among some of the potential partners
 - 15) Power struggle among potential partners (competing for influence and status in the new cooperative arrangement)
 - 16) Resistance from the key stakeholders (e.g. suppliers, distributors or customers)
 - 17) Individual/personal (within some partner firms) resistance to join the cooperation fearing to loose personal interests

Please indicate other unlisted challenges which you have experienced

11. In this cooperative arrangement, what are the advantages of the cooperation between the partners in the same business field and what are the disadvantages?

12. In this cooperative arrangement, what are the advantages of the cooperation between the partners in different field however with complementary activities to each other and what are the disadvantages?
13. Generally speaking, do you think that cooperation between partners in the same business field is better than cooperation between partners who have complementary resources to each other but in different business field? Or it is the other way round? Why?
14. Based on your experience, which of the following factors contributed most to the success and failure of the formation of your cooperative arrangement?

(1= the most important factor /2= important factor /3= neutral /4= less important factor 5= not important factor)

· Generating the idea of the cooperative arrangement	1 2 3 4 5
· Designing a good business strategy	1 2 3 4 5
· Knowledge of the business and related sectors	1 2 3 4 5
· Identifying the right potential partners	1 2 3 4 5
· Having many relevant business contacts	1 2 3 4 5
· Connections with the stakeholders	1 2 3 4 5
· Public relations and communication skills	1 2 3 4 5
· Ability of convincing/putting partners together	1 2 3 4 5
· Bring technology to the cooperative arrangement	1 2 3 4 5
· Bring money to the cooperative arrangement	1 2 3 4 5
· Ability of implementing the business strategy	1 2 3 4 5
· Ability of managing different partners	1 2 3 4 5
15. How would you summarize the key factors and lessons learned which have caused success and failure for the formation of your cooperative arrangement (organization/activity)?
 - 1) Key success factors -
 - 2) Key failure factors -

Relation measurement - centrality, structural hole, ties, dependence/interdependence, formal and informal

16. Whom (individual or organization) do you think is in a best position to coordinate the various relationships in this type of cooperative arrangement? Why?
17. What type of contractual relationship have you adopted for this cooperation arrangement? An official contract, a project based, case-by-case agreement, or other arrangements? Why did you choose this form? What were the most important aspects in it?
18. Based on your experience in this type of cooperative arrangement, to sign a contract with the partners/alliance management is:
 - 1) Very important
 - 2) Important
 - 3) Not so important
 - 4) Not important at all
19. Do you think a highly structured contract will be an advantage for protecting the interests of partners in this particular cooperative form? Why yes and why not?
20. What are the advantages and disadvantages of a loosely linked relationship compare to a tightly linked one among the partners?

21. Did one (or some) “would be partner(s)” who possessed the desirable resources required by this cooperative arrangement withdraw his/their participation during the formation process? If yes, what were the reasons?
22. What are your recommendations to firms, which are in the different business fields than yours, however, would like to form/participate in a similar type of cooperation?

II. DEVELOPMENT CONTEXT

Actors, activities, and roles

23. As the cooperative arrangement (organization/activity) moved into the operational stage, which of the following activities have been your main focus? (in an order of importance 1 2 3 4 5)

(1=very important/2=important/3=neutral/ 4=less important/5=no importance)

. Coordinating relationships among the partners and other stakeholders	1 2 3 4 5
. Strategic leadership of the cooperative arrangement (organization/ activity)	1 2 3 4 5
. Operational coaching and facilitating the cooperative arrangement	
. (Organization/ activity)	1 2 3 4 5
. New business development	1 2 3 4 5
. Identify new partners/members	1 2 3 4 5
. Develop new strategies	1 2 3 4 5
. Develop new leaders for the cooperative arrangement (organization/activity)	1 2 3 4 5
. Concentrating on your own core competence (technical, production, marketing, design etc.,)	1 2 3 4 5
Please specify other unlisted activities	1 2 3 4 5

24. How was the cooperative arrangement (organization/activity) managed? Were all work done by a single person/firm or shared by partners? How were the different functions structured and practiced?
25. Were the managerial responsibilities classified according to strategic and operational characteristics? How were they distributed?
26. How was the financial budget for the management activities established? Was it allocated to the cooperative members?
27. How much times have you devoted to the work in the cooperative arrangement (organization/activity)?
 - . Full time job
 - . More than 50% of the working days
 - . About 50% of the working days
 - . Less than 50% of the working days
 - . 10% of the working days
 - . Others
28. Do you feel the pace of the process in the cooperative (organization/activity) were proceeded slower/ faster than some other members felt? How important is a comfortable pace for all partners to the success of the cooperation?
29. How were the following decisions taken in this cooperative (organization /activity):

- 1 = the core firm alone
- 2 = the core firm with agreement from partners
- 3 = the partner firm alone
- 4 = the cooperative management alone
- 5 = the cooperative management with agreement from the core firm and partners
- 6 = the cooperative management with agreement from the core firm
- 7 = the cooperative management with agreement from the partners

· New partner membership acceptance	1 2 3 4 5 6 7
· Third party cooperation (non existing partner firms)	1 2 3 4 5 6 7
· Sales target setting	1 2 3 4 5 6 7
· Pricing	1 2 3 4 5 6 7
· Budget approval	1 2 3 4 5 6 7
· New product development	1 2 3 4 5 6 7
· Production plan	1 2 3 4 5 6 7
· Quality control standard	1 2 3 4 5 6 7
· Product packaging logo	1 2 3 4 5 6 7
· Changing managers (who has responsibilities in the cooperative arrangement)	1 2 3 4 5 6 7

Communication process (information sharing)

30. How do partners communicate to each other? Through a coordinated system or on an individual bases? How often do partners meet for discussing matters in the cooperative arrangement (organization/activity)?
31. Was there a center of relevant information gathering and exchange for members? What types of information were distributed to all members/stakeholders and through what means?

Competitive and cooperative behavior, actors, activities and roles

32. Have there been any competitive activities or attempts among the cooperative members during the development phase? If yes, what were the issues and how were they handled?
33. Are you afraid of loosing your know-how or commercial secret in this cooperation? What measures did you seek to protect your know-how?

Trust, relations, centrality, structural hole, ties

34. Did personal relationship and trust continually play important roles in the operational stage as they did during the formation process?
35. What efforts have been made in maintaining and developing the relationship and trust among members in the operational phase of the cooperative (organization/activity)?
36. Which are the firms/individuals that maintain the most important relations in the cooperative arrangement (organization/activity) during the operational process?
37. How do you assess the importance of the following relationship pattern and attitude between you and other partners in this cooperation?

(1=very important / 2=important / 3=neutral / 4=less important/5=no importance)

· Open and constructive	1 2 3 4 5
· Compromise	1 2 3 4 5

· Understanding	1 2 3 4 5
· Active communication	1 2 3 4 5
· Supportive	1 2 3 4 5
· Tolerance	1 2 3 4 5
· Casual and easy going	1 2 3 4 5
· Formal and careful	1 2 3 4 5
· Commitment	1 2 3 4 5
· Mutual and equality	1 2 3 4 5
· Fair play	1 2 3 4 5
· Trust	1 2 3 4 5

Company culture

38. Have you found any cultural differences between you and other partners in this cooperative arrangement? What types of problems have been caused by the cultural differences?
39. How were these cultural difference handled and by who?

Autonomy

40. Were members allowed to do the same business with other non member firms? Were there any specific understanding or arrangement made in this regard at the time of jointing this cooperative (organization/activity)? What were the restrictions?
41. Did you have to seek for approval from the alliance management or other partners before conducting such activities? Did you need to report/communicate the intentions/outcomes on such activities?
42. Did you see any existing /potential conflict of interests between this cooperation and your separate business activities? How did you balance them?
43. Which one would you give up - the cooperation or your separate business activity if a decision has to be made? Why?

Learning

44. What knowledge, skills (expected and unexpected at the time of joining the cooperation) have you acquired from this cooperation?
45. What specific regulatory changes over the last 10 years have impacted your business, the formation and development process of this cooperative arrangement?

Environment

46. Which of the following factors are mostly concerned by your business and why:
- China entrance to the World Trade Organization
 - Globalization process
 - Technological development
 - Market changes
47. What types of organization forms/cooperative arrangements are more suitable for the agribusiness sector at present China's economic development stage? Why?

Actors, broker role

48. What is the effective organizer/coordinator/cooperative manager's role in your opinion and why?
49. What do you think if the organizer /cooperative manager's role is assumed by a third party manager rather than assumed by the one like in this arrangement?
50. What kind of third party in your mind is more suitable to perform the alliance organizer /alliance manager's role? Why?
51. Based on your experience, what qualification should one have to manage successfully of this type of organization/ cooperative arrangement?

III. BROKER BEHAVIOR

Leadership style

52. In your opinion, to what extent do the following words accurately describe an effective leadership style for managing this particular type of organization/ activity during the formation process?

(All scores are averages based on a scale of 1 = very low through 7 = very high)

1.Negotiating	1	2	3	4	5	6	7
2.Sharing	1	2	3	4	5	6	7
3.Participative	1	2	3	4	5	6	7
4.Commanding	1	2	3	4	5	6	7
5.Supportive	1	2	3	4	5	6	7
6.Directive	1	2	3	4	5	6	7
7.Resolute	1	2	3	4	5	6	7
8.Autocratic	1	2	3	4	5	6	7
9.Authoritative	1	2	3	4	5	6	7

Conflict management style

53. To what extent disagreement over alliance creation issues were resolved by (using single-item measures):
a) Executive order, b) Debate, c) Compromise, d) Accommodation

Politics

54. Did coalitions form and change among decision makers during the formation process?
55. Can the development process be characterized as an exercise in bargaining, negotiation, and compromise?

Information processing structure

56. During the development process, to what extent:
 - 1) did you feel that you had the opportunity to express your ideas about the relationship?
 - 2) did you feel that your views were included in the decision process?
 - 3) did you feel that other's ideas were imposed upon you?
 - 4) Were written rules and procedure followed?

- 5) Did individuals interact with each other on an informal basis?
- 6) Did committees, such as ad hoc groups, form to deal with strategic issues?
- 7) Did one or two people dominate the handling of the development process?
- 8) Was there a free and open exchange of ideas?

57. To what extent can the development process be characterized as:

- 1) Formal and rule-oriented?
- 2) Participative?
- 3) Interactive?

58. Please give a note to each factor according to their importance for the successful cooperative (Organization /activity)

(1=very important /2=important/3=neutral /4=little importance /5=no importance)

- Freedom of joining in and withdraw from the cooperation
- Maintaining external relationship (versus integrated relationship)
- Organizational flexibility
- Similarity of combined activities
- Complementarity of combined activities
- A power based cooperative manager (e.g. big companies have money and technology)
- A knowledge based cooperative manager (the professional firm in the field specializing in strategy design and implementation lead, have links to relevant financial and technical institutions)
- Consistent management (one cooperative manager for strategic design and implementation)
- Trustful relationships among partners
- Transparent information of the operation (organization /activity)
- Active communication between partners
- Any other key success factors

IV. PERFORMANCE CONTEXT

59. To what extent have each of the following performance objectives of the alliance organization been met?

(All scores are averages based on a scale of 1=very low through 7=very high)

- 1) Profitability
- 2) Net profit for the coming year
- 3) Growth
- 4) Market share
- 5) Prestige or positive attitude of cooperative partners/members
- 6) Innovation
- 7) Appreciation from the local government or the community
- 8) Social responsibility (other goals)

60. Have you used a similar type of cooperative arrangement in your expansion program to other provinces? What modifications have been made? Why?

61. Are you personally happy with the outcome of this cooperation (Organization/activity)? Why?

62. Do you think most of other individuals are happy with this cooperative (organization/activity)? Why?

Appendix III: (Question 2) Motivation factors and objectives of all actors in the NW groups (Government/SOEs/POE actors)

No	Scale: 1 very important, 5 not important	1	2	3	4	5	Answers	No answers	Total
1	Responding to a growth opportunity	14	4	5	2	1	26	0	26
2	Reducing market uncertainty to your business	4	6	6	5	5	26	0	26
3	Improving product quality	11	9	3	1	2	26	0	26
4	A step towards diversification/expansion	8	9	4	2	3	26	0	26
5	A chance to survive	5	7	3	3	8	26	0	26
6	Sharing R&D, HR, marketing costs and expenses with partners	5	8	7	4	2	26	0	26
7	Sharing information	2	6	13	2	3	26	0	26
8	Sharing a license for producing, distributing a particular product/activity		6	8	4	8	26	0	26
9	Gaining market share position	10	7	4	2	2	26	0	26
10	Gaining a stronger purchasing position	3	6	6	2	9	26	0	26
11	Gaining a stronger price increasing position	1	9	8	3	5	26	0	26
12	Access financial resources	5	7	5	1	8	26	0	26
13	Access technology from the partnership	4	7	3	4	8	26	0	26
14	Access new sales or export channels	1	9	7	2	7	26	0	26
15	Ecological pressure	2	5	11	2	6	26	0	26
16	Decision of the superior/required by the government or state owner	7	4	5	1	9	26	0	26
17	Gaining organizational flexibility through changing ownership structure	3	11	6	1	5	26	0	26

Appendix IV: (Question 2) Motivation factors and objectives of the Government Agency Actors

No	Scale: 1 very important, 5 not important	1	2	3	4	5	Answers	No answers	Total
1	Responding to a growth opportunity	4	2	2			8	0	8
2	Reducing market uncertainty to your business		2	2	3	1	8	0	8
3	Improving product quality	4	2	1	1		8	0	8
4	A step towards diversification/expansion	1	3	2	1		8	0	8
5	A chance to survive	1		2	1	4	8	0	8
6	Sharing R&D, HR, marketing costs and expenses with partners	1	1	4		2	8	0	8
7	Sharing information			5		3	8	0	8
8	Sharing a license for producing, distributing a particular product/activity	1	1	3		3	8	0	8
9	Gaining market share position	3	2	2		1	8	0	8
10	Gaining a stronger purchasing position		2	2		4	8	0	8
11	Gaining a stronger price increasing position		1	2	2	3	8	0	8
12	Access financial resources	1	1	4		2	8	0	8
13	Access technology from the partnership	2	3		1	2	8	0	8
14	Access new sale or export channels	1	2	1	1	4	8	0	8
15	Ecological pressure	2	1	4		1	8	0	8
16	Decision of the superior/required by the government or state owner	1	1	4	1	1	8	0	8
17	Gaining organizational flexibility through changing ownership structure		2	3	1	2	8	0	8

Appendix V: (Question 2) Motivation factors and objectives of the Government Agency Actors (at different levels)

No	Scale: 1 very important, 5 not important	1	2	3	4	5	Answers	No answers	Total
1	Responding to a growth opportunity	1 3	1 1	2 2			8	0	8
2	Reducing market uncertainty to your business		1 1	2 2	1 2	1 1	8	0	8
3	Improving product quality		1 1		1 1		8	0	8
4	A step towards diversification/expansion		1 1	1 2	1 2	1 1	8	0	8
5	A chance to survive		1 1		1 1		8	0	8
6	Sharing R&D, HR, marketing costs and expenses with partners		1 1	1 3		2	8	0	8
7	Sharing information			2 3		3	8	0	8
8	Sharing a license for producing, distributing a particular product/activity		1 1	1 1		3	8	0	8
9	Gaining market share position		1 2	1 1	2 2	1	8	0	8
10	Gaining a stronger purchasing position			1 1	1 1	4	8	0	8
11	Gaining a stronger price increasing position			1 1	1 1	3	8	0	8
12	Access financial resources		1 1		1 3	2	8	0	8
13	Access technology from the partnership		1 1		1 3	2	8	0	8
14	Access new sale or export channels			1 2	1 2	4	8	0	8
15	Ecological pressure		1 1		3 3	1	8	0	8
16	Decision of the superior/required by the government or state owner		1 1	1 4		1	8	0	8
17	Gaining organizational flexibility through changing ownership structure			2 3	1 1	2	8	0	8
Central/Provincial level Government Administrators									
Provincial/County/Township Agrotechnical Administrator									

Appendix VI: (Question 2) Motivation factors and objectives of the SOE Actors

No	Scale: 1 very important, 5 not important	1	2	3	4	5	Answers	No answers	Total
1	Responding to a growth opportunity	5	2	3	2	1	13	0	13
2	Reducing market uncertainty to your business	2	2	4	2	3	13	0	13
3	Improving product quality	6	3	2		2	13	0	13
4	A step towards diversification/expansion	4	4	1	1	3	13	0	13
5	A chance to survive	2	5	1	1	4	13	0	13
6	Sharing R&D, HR, marketing costs and expenses with partners	2	4	3	4		13	0	13
7	Sharing information	1	4	6	2		13	0	13
8	Sharing a license for producing, distributing a particular product/activity		3	2	3	5	13	0	13
9	Gaining market share position	4	4	1	2	2	13	0	13
10	Gaining a stronger purchasing position	1	2	3	2	5	13	0	13
11	Gaining a stronger price increasing position		3	6	2	2	13	0	13
12	Access financial resources	2	4	1		6	13	0	13
13	Access technology from the partnership	1	3	3	2	4	13	0	13
14	Access new sale or export channels		5	4	1	3	13	0	13
15	Ecological pressure		4	3	1	5	13	0	13
16	Decision of the superior/required by the government or state owner	5	2			6	13	0	13
17	Gaining organizational flexibility through changing ownership structure	2	6	2		2	13	0	13

Appendix VII: (Question 2) Motivation factors and objectives of the SOIEs, SODEs, SORIs actors

No	Scale: 1 very important, 5 not important	1	2	3	4	5	Answers	No answers	Total
1	Responding to a growth opportunity	3	1	3	1		13	0	13
2	Reducing market uncertainty to your business	2	1		1	1	13	0	13
		2	2	2	1	1			
3	Improving product quality	2	3	1		2	13	0	13
		4		1					
4	A step towards diversification/expansion	2	3	1	1	1	13	0	13
		2	1			2			
5	A chance to survive	2	4		1	1	13	0	13
		2	1	1		3			
6	Sharing R&D, HR, marketing costs and expenses with partners	1	3	2	2		13	0	13
		1	1	1	2				
7	Sharing information	1	3	3	1		13	0	13
			1	3	1				
8	Sharing a license for producing, distributing a particular product/activity		2	1	3	2	13	0	13
			1	1		3			
9	Gaining market share position	3	2		2	1	13	0	13
		1	2	1		1			
10	Gaining a stronger purchasing position	1	2	2	2	1	13	0	13
				1		4			
11	Gaining a stronger price increasing position		3	4	1	2	13	0	13
			2	2	1	2			
12	Access financial resources	2	2			4	13	0	13
		2	2	1		2			
13	Access technology from the partnership	1	2	1	2	2	13	0	13
			1	2		2			
14	Access new sale or export channels		4	2	1	1	13	0	13
			1	2		2			
15	Ecological pressure		2	2	1	3	13	0	13
			2	1		2			
16	Decision of the superior/required by the government or state owner	5	2			1	13	0	13
						5			
17	Gaining organizational flexibility through changing ownership structure	2	5	1			13	0	13
			1	2		2			
SOIEs /SODEs		SORIs							

Appendix VIII: (Question 2) Motivation factors and objectives of the POE actors

No	Scale: 1 very important, 5 not important	1	2	3	4	5	Answers	No answers	Total
1	Responding to a growth opportunity	5					5	0	5
2	Reducing market uncertainty to your business	2	2	1			5	0	5
3	Improving product quality	1	4				5	0	5
4	A step towards diversification/expansion	2	2	1			5	0	5
5	A chance to survive	2	2		1		5	0	5
6	Sharing R&D, HR, marketing costs and expenses with partners	2	3				5	0	5
7	Sharing information	1	2	2			5	0	5
8	Sharing a license for producing, distributing a particular product/activity		1	3	1		5	0	5
9	Gaining market share position	3	1	1			5	0	5
10	Gaining a stronger purchasing position	1	3	1			5	0	5
11	Gaining a stronger price increasing position	2	3				5	0	5
12	Access financial resources	2	2		1		5	0	5
13	Access technology from the partnership		1		1	3	5	0	5
14	Access new sale or export channels	1	3	1			5	0	5
15	Ecological pressure			4	1		5	0	5
16	Decision of the superior/required by the government or state owner	1	1	1		2	5	0	5
17	Gaining organizational flexibility through changing ownership structure	1	3			1	5	0	5

Appendix IX: (Question 2) Motivation factors and objectives of the actors in the INW's Group

No	Scale: 1 very important, 5 not important	1	2	3	4	5	Answers	No answers	Total
1	Responding to a growth opportunity	3	2	3	1		9	0	9
2	Reducing market uncertainty to your business	1	3	2	2	1	9	0	9
3	Improving product quality	1	4	1	1	2	9	0	9
4	A step towards diversification/expansion	3	3	1	1	1	9	0	9
5	A chance to survive	2	4		2	1	9	0	9
6	Sharing R&D, HR, marketing costs and expenses with partners	2	3	3	1		9	0	9
7	Sharing information	1	3	4	1		9	0	9
8	Sharing a license for producing, distributing a particular product/activity		2	2	3	2	9	0	9
9	Gaining market share position	4	3		1	1	9	0	9
10	Gaining a stronger purchasing position	1	3	3	1	1	9	0	9
11	Gaining a stronger price increasing position		4	5			9	0	9
12	Access financial resources	3	2	1		3	9	0	9
13	Access technology from the partnership	2	2	1	3	1	9	0	9
14	Access new sale or export channels		5	2	2		9	0	9
15	Ecological pressure	1	1	3	1	3	9	0	9
16	Decision of the superior/required by the government or state owner	6	3				9	0	9
17	Gaining organizational flexibility through changing ownership structure	1	7	1			9	0	9

Appendix X: (Question 2) Motivation factors and objectives of the actors in the SNWs Group

No	Scale: 1 very important, 5 not important	1	2	3	4	5	Answers	No answers	Total
1	Responding to a growth opportunity	6	1	1	1		9	0	9
2	Reducing market uncertainty to your business	3	1	1	1	3	9	0	9
3	Improving product quality	6	3				9	0	9
4	A step towards diversification/expansion	3	4	1	1		9	0	9
5	A chance to survive	3	1	1	1	3	9	0	9
6	Sharing R&D, HR, marketing costs and expenses with partners	2	3	1	2	1	9	0	9
7	Sharing information	1	2	4		2	9	0	9
8	Sharing a license for producing, distributing a particular product/activity		3	2	1	3	9	0	9
9	Gaining market share position	3	2	1	1	2	9	0	9
10	Gaining a stronger purchasing position	1	2	1	1	4	9	0	9
11	Gaining a stronger price increasing position	1	3	1	2	2	9	0	9
12	Access financial resources	2	3	1	1	2	9	0	9
13	Access technology from the partnership		1		1	7	9	0	9
14	Access new sale or export channels	1	2	2		4	9	0	9
15	Ecological pressure	1	3	4	1		9	0	9
16	Decision of the superior/required by the government or state owner	1	1	1	1	5	9	0	9
17	Gaining organizational flexibility through changing ownership structure	2	2	2	1	2	9	0	9

Appendix XI: Question 2 / Motivation factors and objectives of the actors in the DNWs Group

No	Scale: 1 very important, 5 not important	1	2	3	4	5	Answers	No answers	Total
1	Responding to a growth opportunity	5	1	1		1	8	0	8
2	Reducing market uncertainty to your business		2	3	2	1	8	0	8
3	Improving product quality	4	2	2			8	0	8
4	A step towards diversification/expansion	2	2	2		2	8	0	8
5	A chance to survive		2	2		4	8	0	8
6	Sharing R&D, HR, marketing costs and expenses with partners	1	2	3	1	1	8	0	8
7	Sharing information		1	5	1	1	8	0	8
8	Sharing a license for producing, distributing a particular product/activity		1	4		3	8	0	8
9	Gaining market share position	3	2	3			8	0	8
10	Gaining a stronger purchasing position		2	2		4	8	0	8
11	Gaining a stronger price increasing position		2	2	1	3	8	0	8
12	Access financial resources		2	3		3	8	0	8
13	Access technology from the partnership	1	4	2		1	8	0	8
14	Access new sale or export channels		2	3		3	8	0	8
15	Ecological pressure		1	4		3	8	0	8
16	Decision of the superior/required by the government or state owner			4		4	8	0	8
17	Gaining organizational flexibility through changing ownership structure		2	3		3	8	0	8

Appendix XII: (Question 6) NW Participant's Preferences on Cooperative Partners

All scores are averages based on a scale of 1 = very important to 5 = not important. Samples size = 27								
	The Hybrid seeds NW	The Honeybee NW	The Compound fertilizer NW	The Biofertilizer NW	The Agrochemicals NW	The Ammonia NW	Total	
A	Track record of good cooperation...	2	3.2	1.5	2.4	2.5	1.8	2.2
B	Business relationship with ...	2	2.4	3	1.6	3.5	2.4	2.5
C	Personal relationships with ...	2	3.2	3.25	2	4.5	3.4	3
D	Possession of key resources required	1.25	1.6	1.5	1.4	2.25	2	1.67
E	Capable management team	2.75	3.2	1.75	1.8	3.25	1.6	2.4
F	Synergy in the same business field	1.75	1.4	1.5	1.2	2.75	1.6	1.7
G	Financial strength	3	3.4	1.25	1.6	2	1.4	2.1
H	Non-competitor	2	2.2	1.75	2.4	3.25	3.4	2.5
I	Unlikely becoming a future competitor	2.5	3.2	2.25	4	3	2.6	3
J	Compatible company culture	3.25	3.6	3.25	2.4	3	2.4	3

Appendix XIII: (Question 13 member and 14 broker) Key Factors to the NW Formation Process

All scores are averages based on a scale of 1 = very important to 5 = not important. Samples size = 27							
	The Hybrid seeds NW	The Honeybee NW	The Compound fertilizer NW	The Biofertilizer NW	The Agrochemicals NW	The Ammonia NW	TOTAL
A Generating the idea of the cooperative arrangement	1.2	1.8	1.8	1.5	1.6	1.7	1.7
B Designing a good business strategy	1.7	1.8	1.8	1.5	1.6	1.6	1.6
C Knowledge of the business and related sectors	1.2	1.8	1.6	2	1.6	2	2
D Identifying the right potential partners	1.7	1.8	1.6	2.7	1.6	2.7	2
E Having many relevant business contacts	1.7	1.6	1.6	2.5	2.2	2.5	2
F Connections with the stakeholders	1.7	2.4	1.6	2.5	2.4	2.5	2.1
G Public relations /communication skills	2	1.8	1.8	2.7	1.8	2.7	2.1
H Ability of convincing/putting partners together	1.7	1.8	1.6	2.7	2.6	2.7	2.1
I Bring technology to the cooperative arrangement	1.5	2	2.6	1.5	1.8	3.2	2.1
J Bring money to the cooperative arrangement	2.7	2.4	2.6	2	1.8	2.2	2.2
K Ability of implementing the business strategy	1.5	1.8	1.8	1.7	1.8	1.7	1.7
L Ability of managing different partners	1.5	1.8	1.6	2	2.2	2	1.8

Appendix XIV: (Question 35 member 37 broker) Importance of relationship patterns and attitude between the NW partners

Scale: 1=very important / 2=important / 3=neutral / 4=less important/5=no importance

	1	2	3	4	5	Answers	No answers	Total
Open and constructive	17	8	2			27	0	27
Compromise	3	11	9	1	3	27	0	27
Understanding	9	18				27	0	27
Active communication	13	14				27	0	27
Supportive	11	15	3			27	0	27
Tolerance	4	13	6	4		27	0	27
Casual and careful	3	9	12	3		27	0	27
Formal and careful	8	8	6	4	1	27	0	27
Commitment	15	8	4			27	0	27
Mutual and equality	11	14	2			27	0	27
Fair play	14	9	4			27	0	27
Trust	19	7	1			27	0	27

Appendix XV: (Questions 54 member and 58 broker) Important Factors for the Successful NW Cooperation

All scores are averages based on a scale of 1 = very important to 5 = not important. Samples size = 27

	The Hybrid seeds NW	The Honeybee NW	The Compound fertilizer NW	The Biofertilizer NW	The Agrochemicals NW	The Ammonia NW	Total
A Freedom of joining in and withdraw from the cooperation	3.7	3	2.2	1.7	1.8	2	2.4
B Maintaining external relationship (versus integrated relationship)	1.7	2	2.8	1.2	1.4	2	1.8
C Organizational flexibility	1.7	1.8	2	1	2	1.2	1.6
D Similarity of combined activities	4	4.6	3.8	2.7	2.2	2.7	3.3
E Complementarities of combined activities	1.2	2	2.2	2	2	2.7	2
F A power based cooperative manager	2.5	3	2	1.7	1.6	2	2.1
G A knowledge based cooperative manager	2.2	1.8	1.8	1.5	1.2	1.2	1.6
H Consistent management (one cooperative manager)	2	1.8	1.6	1.2	1.6	1.7	1.6
I Trustful relationships among partners	1.2	1.4	1	1	1.4	1.2	1.2
J Transparent information of the operation (organization/activity)	1.7	2.2	1	2	2.2	1.5	1.7
K Active communication between partners	1.7	1.8	1.8	1.7	2	1.7	1.7

Appendix XVI: (Question 10 broker only) Key challenges faced by each broker during NW's formational phase

	The Hybrid seeds NW	The Honeybee NW	The Biofertilizer NW	The Compound fertilizer NW	The Ammonia NW	The Agrochemicals NW
1. Determining a good business opportunity	*		*		*	*
2. Work out a solid business plan and proposal		*	*		*	
3. Identifying suitable potential partners			*			*
4. Gaining support from the parent organization		*	*		*	*
5. Convincing potential partners to join the cooperative arrangement		*	*	*		*
6. Regulatory barriers (e.g. business license, ecological requirement)		*		*		*
7. Financial resource constraints	*		*		*	*
8. Size of the firm			*			
9. Personal relationship/contact to the key stakeholders			*			
10. Some potential partners have doubt about the feasibility of the project (e.g. market acceptance, technological and managerial requirement etc.)			*			
11. Some potential partners have lack of confidence on your ability to leverage the projected opportunity			*			
12. Some potential partners did not trust you						
13. Some potential partners did not trust or dislike other partners in the cooperative arrangement						*
14. Conflicts of interests among some of the potential partners					*	*
15. Power struggle among potential partners (competing for influence and status in the new cooperative arrangement)		*				
16. Resistance from the key stakeholders (e.g. suppliers, distributors or customers)					*	*
17. Individual/personal (within some partner firms) resistance to join the cooperation fearing to loose personal interests						*

B = brokers

Appendix XVII: (Question 23 broker only) Main activities and broker roles during the NW developmental phase

Scale: 1=very important / 2=important / 3=neutral / 4=less important/5=no importance

	1	2	3	4	5	Answers	No answers	Total
A. Coordinating relationships among the partners and other stakeholders	5	3	1			9	0	9
B. Strategic leadership of the cooperative arrangement (organization/ activity)	5	2	2			9	0	9
C. Operational coaching and facilitating the cooperative arrangement	1	7	1			9	0	9
D. New business development	4	2	3			9	0	9
E. Identify new partners/members	1	4	1	2	1	9	0	9
F. Develop new strategies	1	7			1	9	0	9
G. Develop new leaders for the cooperative arrangement (organization /activity)	1	4	2	1	1	9	0	9
H. Concentrating on your own core competence (technical, production, marketing, design etc	3	2	4			9	0	9

6 brokers plus 3 stakeholders from the broker's parent organizations

Appendix XVIII: (Question 52 member 54 brokers) Information processing structure (broker behavior during the development phase)

[illegible]

Appendix XIX: (Question 49 member 51/53 brokers/stakeholders) Conflict management

Disagreement over alliance creation issues were resolved by (using single-item measures):	The Hybrid seeds NW	The Honeybee NW	The Biofertilizer NW	The Compound fertilizer NW	The Ammonia NW	The Agrochemicals NW
Executive order					5	4
Debate	2	5	1	1		
Compromise	2					1
Accommodation			3	1		

Appendix XX: (Question 50 member 52/54 brokers/stakeholders) NW politics

Did coalitions formed and changed among decision makers during the formation process?	The Hybrid seeds NW	The Honeybee NW	The Biofertilizer NW	The Compound fertilizer NW	The Ammonia NW	The Agrochemicals NW
No	No	No	No	No	Yes	Yes

Appendix XXI: (Question 44 member 46 broker) External environmental impacts on the NV participants' business activities

The most concerned factors	The Hybrid seeds NW	The Honeybee NW	The Biofertilizer NW	The Compound fertilizer NW	The Ammonia NW	The Agrochemicals NW
1 China's WTO accession	*			*	*	*
2 Globalization process						*
3 Technological development	*	*	*	*	*	*
4 Market changes		*	*	*	*	*