INSTITUTIONAL ECONOMIC ANALYSIS OF VEGETABLE PRODUCTION AND MARKETING IN NORTHERN PHILIPPINES: SOCIAL CAPITAL, INSTITUTIONS AND GOVERNANCE

Promotor:	Prof.dr.ir. A.J. Oskam Hoogleraar Agrarische Economie en Plattelandsbeleid Wageningen Universiteit
Co-promotor:	Dr.ir. L.H.G. Slangen Universitair Hoofddocent Leerstoelgroep Agrarische Economie en Plattelandsbeleid Wageningen Universiteit
Promotiecommissie:	Prof.dr. A. Niehof, Wageningen Universiteit Dr. H.A.J. Moll, Wageningen Universiteit Prof. G. Van Huylenbroeck, Universiteit Gent, België Prof. K. Karantininis, KVL, Denemarken
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INSTITUTIONAL ECONOMIC ANALYSIS OF VEGETABLE PRODUCTION AND MARKETING IN NORTHERN PHILIPPINES: SOCIAL CAPITAL, INSTITUTIONS AND GOVERNANCE

Aimee Milagrosa

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For my mother Sergia and my husband Dirk

Abstract

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This study examines vegetable production and marketing among indigenous communities in northern Philippines using an institutional economics approach. It develops a framework that analyses the four levels of institutions; Social Embededdness, Institutional Environment, Governance Structures and Resource Allocation alongside the Structure, Conduct and Performance of the vegetable sector. Using this integrated framework, the thesis engages on a range of topics from the structure of the sector to sales and margins, from trust to favoured-buyer systems and from transaction cost analysis to farmer's decision-making processes. Also, a framework that aligns efficient contract types with governance structures based on observable transaction attributes was developed. The modeling approach that determines how farmers choose trading partners based on farm and farmer characteristics, transaction attributes and social capital was likewise used.

The first important finding of the study is that a dual structure - in terms of farm-size and total sales - exists in the province. On the one hand, several small farmers own small farm sizes and share a small percentage of total market sales. On the other hand, a few big farmers own big farms and share a big percentage of total market sales. Three governance structures dominate trade; the most common are commissioner-based followed by wholesaler and contractor-based organization. Another important finding of the research is that many farmers turn to wholesalers for loans because of difficulties accessing or complying with formal credit institutions. At harvest time the repayment scheme forces farmers into trading arrangements with wholesalers which in turn, lowers search, negotiation and enforcement costs. This *locked-in* effect reduces trading alternatives for farmers and lowers total transaction costs. Not surprisingly, wholesaler-based governance structure is the most efficient marketing arrangement from a transaction costs perspective. A third important finding of the thesis is that the social capital of farmers and traders in the province, aggregated from scores on trust, associatedness, common goals and optimism, is low. Current social capital is ineffective in facilitating market information exchange and providing countervailing power to farmers in selling crops. With regards to decision-making, the study showed that farmers with relatively higher social capital select traders differently from farmers with lower social capital. Moreover, ethnicity is a significant factor that influences trust, volunteerism and social networking as well as trading partner selection. This thesis shows that bringing in social elements such as social capital and culture in institutional economic analysis yields richer results in the explanation of behaviour of the market and its participants.

Keywords: Philippines, vegetable production and marketing, institutional economics, social capital, institutional environment, governance structures

Preface

In writing the acknowledgement, I am reminded of an unpleasant incident that occurred 14 years ago. As the valedictorian of the 200-plus graduating high school students of batch 1993, I was instructed by our then-advisor to compose the valedictory address for the commencement exercises. By midday I was halfway though with the essay in which I, given the privilege to be the voice of the young graduates, carefully poured out our gratitude to teachers, mentors and families that supported us during our high school education. I didn't manage to finish the essay, let alone read it during graduation, because by afternoon, the same advisor notified me that I was moved down to salutatory honours. Four years of dedication to academic excellence and bringing honour to the University was apparently not enough to accord me the highest tribute let alone warrant an explanation for the change in decision. Now, as I write this preface, I am resolute to see it until the end. I am overjoyed that finally my efforts are being recognized and that I will be rewarded for something I worked hard for and truly deserve.

This thesis marks the end of a long journey I was determined to take, for as long as I could remember. It marks a milestone in my life; the fulfillment of a dream, the end of an era, and the beginning of another period of my existence. I traveled across countries and discovered unfamiliar cultures to fulfill my dream of a higher education. I learned a lot about myself in the process. I realized that the journey is equally important as the outcome because of numerous enriching experiences and fascinating people who I met along the way. Now, I would like to take this opportunity to thank the many individuals who have contributed their time and effort in assisting me in my education and the process of creating this book. If I have forgotten to mention some names, please note that I thank you from my heart nevertheless.

First of all, I would like to express my sincerest gratitude to my supervisor Louis H. G. Slangen for the valuable contributions and many fruitful discussions we had in the duration of my PhD studies. His thoughtful guidance and critical reviews of my output helped me find a path towards which to direct my work and steered me back when I tended to get lost.

My deepest appreciation also goes to my promotor Arie J. Oskam. I am profoundly grateful for all his constructive comments to make my thesis better, for his unwearied reviews of numerous drafts and for the academic, professional and personal advice. His detailed remarks helped me refine the quality of my work. Moreover, without his assistance when I was left without funding, I probably would not have finished at all.

An important part of this thesis was written under the supervision of Alison Burrell. I would like to express my deep and sincere appreciation for her involvement and assistance with regards to my models. Hectic schedule notwithstanding, Alison patiently guided me until the models worked and the econometrics made sense. Thank you for sharing your experience, knowledge and precious time, and for the priceless lessons that would last a lifetime.

I am indebted to the whole Agricultural Economics and Rural Policy Group for the help and support, the productive discussions and valuable suggestions with regards to

my work. Special thanks go to Karen, Wilbert and Dineke for the indispensable technical support I needed over the years I stayed in and out of Wageningen UR.

The journey I took was made easier because friends and family have made the five-year, three-week and five-day voyage more bearable with their friendship and support. For the camaraderie and useful informal conversations, I would like to thank all the friends that I have met in the course of my education in Wageningen; my co-PhDs in AEP as well as other PhDs from other groups. For the companionship of all Filipino scholars still in Wageningen or gone home, thank you for making my stay more enjoyable.

My faith has sustained me through the most trying times of the research. I am grateful to the Filipino Catholic Community in Bonn led by Father Jun de Ocampo for the spiritual lift I needed when I was down or doubting. I also express my gratitude to Weng for taking care of Toria and to Rowie, Matladi and Ela for being good friends through and through. I would also like to thank the support of Papa Rudi and Mama Ute Hampel who were very generous with their time in taking care of Toria; Dirk and Angela Holtermann for the words of encouragement; and Otto and Renate for the concern about my welfare.

Without my mother, Sergia Milagrosa, I would not have the emotional strength to pursue my PhD to its completion. She is the role model I try to emulate, and from whom I developed the idea to obtain a doctoral degree. I also thank my sisters-in-crime Aileen and Rene Ann 'Bong' who have always been very supportive of me. Ate Aileen's package from Australia arrived at the most appreciated opportunity, when I was at my lowest point with literally nothing to wear. I especially thank Bong from the bottom of my heart for coming over from the Philippines to take care of Toria. To all of you, thanks for giving me some sunshine, for your prayers and advice that sustained me through my years in Europe and strengthened me to push on.

I express my sincerest gratitude to my husband Dirk Hampel who has been enormously supportive of my PhD education. In the highs and lows of this long ride, your unfailing encouragement and concern was incomparable and invaluable. I thank you for seeing me through the difficult and happy moments of the PhD period. Most importantly, my deepest appreciation goes to you for assuming my responsibility as *nanay* to Toria when I was away. To Victoria Lee, the most beautiful and smartest little girl under 104 centimeters, you are small but not incapable of understanding. Thank you for letting your *nanay* go to "Olan" and for being a brave girl with Papa.

Above all, I would like to thank God for absolutely *EVERYTHING*. As promised, I offer You this book.

Aimee Milagrosa
Wageningen, September 2006

TABLE OF CONTENTS

Chapter 1: Introduction

1.1 Backgrounder: Benguet as a Less Favoured Area

Less-favoured areas or LFAs are regions or countries that face socio-economic and/or agro-ecologic resource constraints. These are areas where "*physical conditions and/or lack of infrastructure and service support allow only for low level incomes to be realised…*" (Oskam *et al.*, 2004: 447). Such areas are characterised by low levels of agricultural productivity, poor infrastructures and poverty (Ruben and Pender, 2004; Ruben *et al.*, 2004: 304-305; Ruben *et al.*, 2004: 295). Around 40% of the rural population in developing countries live in less favoured areas, mostly in marginal areas located in mountainous and hillside regions, and arid or semi-arid zones.

Located in the northern part of the Philippines along the Cordillera mountain ranges, is the largely agriculture-based Benguet province[1]. Benguet is no stranger to penury. In 2000, the National Statistics Coordination Board (NSCB, 2001: 142) reported that a little over 30% of provincial population live in poverty[2]. Land degradation, marginal productivity and sub-standard or missing infrastructure-support are some of the problems being faced by the province. According to Pender (2004: 340), these severe-interrelated problems are common to many highland areas. It is because of adverse natural conditions and a lack of resources that these areas are termed "Less Favoured". It is similarly because of these reasons that Benguet can be classified as a less favoured area. Several man-made and natural resource constraints hinder the province's economic growth.

In terms of socio-economic constraints, poor or limited market access due to missing or low-quality farm-to-market roads comprise the bulk of marketing costs and losses for market participants. The Halsema highway (locally known as the Mountain trail) that snakes through borders of most municipalities is the only artery linking vegetable-producing communities to two major trading markets serving the whole province. The remoteness of communities is emphasized when they are always under threat to be cut off from the markets due to landslides affecting many roads in the rainy season. The few vegetable trading posts are clustered mainly in certain municipalities, incapable of handling harvest overflows. Moreover, cold storage warehouses, docking bays for delivery trucks and technology that support timely market information transfer, are lacking province-wide (Dalmo *et al.*, 1994: 16). Aside from poor infrastructure and service support, Ruben and Pender (2004: 305) refer to the neglect of the less favoured areas by policy makers as well as the neglect by agriculture and research extension activities.

In terms of agro-ecologic constraints, the steep slopes and poor soils typical of Cordillera topography have challenged vegetable growers for centuries. Terracing, hillside planting and intensive agriculture define vegetable production in the region. Benguet is also located along the typhoon belt, the common course taken by storms

[1] In Chapter 3, Figure 3.2, is a map of the Philippines showing the Cordillera Administriative Region (CAR) and the municipalities in the province of Benguet

[2] Poverty incidence refers to the proportion of families (or population) with per capita income less than the per capita poverty threshold to the total number of families (population).

passing through the Philippines. This makes it prone to unusually heavy rains during the rainy season that result in soil leaching, erosion and environmental damage. Moreover, many farmers are dependent on the rain-fed agriculture due to lack of irrigation facilities. These natural and man made resource constraints not only act together to thrust a third of regional population into poverty but actually hinder them from escaping it.

Kuyvenhoven (2004: 409) appeared to describe the province when he argued that imperfect markets in rural areas of less-favoured lands function with high transaction costs and lack of information, restricting trade and growth. In reality, market imperfection is a vague concept because there are many sources and effects *of* market failure. The problem of imperfect market transactions could stem from the actions of people that function within the market, or the stakeholders, as they follow social norms and tradition. Imperfection could also stem from the laws of society, the institutional environment or the structure of the agricultural sector. There are many reasons for market failure, but they all lead to one thing: the poor performance of the market, and a reduction in the welfare of stakeholders. With this in mind, a two-pronged approach for the analysis of economic exchange in Benguet is developed: on the one hand considering the socio-economic dimension of vegetable production and marketing, on the other, the institutional economic dimension. In considering the socio-economic and institutional economic attributes, not only is the play of the game identified and examined, but the rules of the game, and how those rules came about, will be better understood.

The institutional economic approach towards Benguet marketing system will provide answers on why the vegetable industry is the way it is by offering the framework for motivation and interaction among market participants. The institutional environment (IE) is composed of formal and informal rules. Formal rules of the marketing system are represented by regulations and policies governing vegetable trade. They represent the general rules of society (Oskam *et al.*, 2004: 453). Informal rules are linked to intangible aspects of human relations with respect to vegetable trading. From this research component, an independent pillar of the socio-economic dimension can be distinguished; the social capital. Putnam (2000) defines social capital as, "the collective value of all social networks" and the shared values borne out of these networks. Social capital is a product of centuries of human behavioural evolution and includes, among others, trust, voluntarism and networks. It is embedded in the people and visible in the form of cultures, traditions, taboos, and norms. It traverses all social activities; it sets the stage and determines tacit rules for interactions within the marketplace.

Thus, from the socio-economic and institutional economic dimensions, the structural framework of vegetable marketing in Benguet is laid out. Additionally, because of strong tribal affiliations amongst groups of farmers and traders, the human attributes of ethnicity, culture and tradition cast a shadow on the trading activities conducted by most ethnic market participants. It is from these environments that governance structures are established because the rules precondition the types of governance structures that exist in physical markets. These transactions within governance structures incur costs and determine the overall efficiency of the market.

To mitigate market inefficiencies, public investments in the form of infrastructure, research and development are needed within Benguet. Pender (2004: 362) argues that even in less favoured environments, several development options are possible. The results of this thesis are therefore focused on determining strategic development options for the agricultural sector of northern Philippines. More specifically, the research described in this thesis focuses on the institutional aspect of vegetable production and marketing, an area that has been neglected by past researches.

Strategies that target rural development should be tailored specifically at alleviating the area's most limiting socio-economic and agro-ecologic constraints. In the case of Benguet, these strategies must take into consideration, unique cultural characteristics of the people living in farming communities while at the same time evaluating the area's comparative advantage. Recent research shows that tailored investments in less favoured areas may bring in more marginal agricultural growth than investing in developed places. Kuyvenhoven (2004: 416), citing studies in India, rural China and Africa (Fan and Chan-Kang, 2004) stresses that "*targeting investments in ... agricultural research ... in LFAs offer good prospects for increasing productivity and contribute most to poverty reduction*". Citing the Tigray experience, Pender (2004: 362-363) stresses the importance of paying attention to profitable opportunities in LFAs even if they deviate from common development pathways. In Benguet, much research has been channelled to the production aspect of agriculture and many have overlooked the importance of a well-functioning supply-chain. This research therefore focuses on the social aspect and in particular, institutional design of the sector, because it is from here that the roots and the *rules* of production and marketing are determined.

Reviewing Benguet vegetable trading environments from an institutional economics perspective will provide an explanation on how and why the market works the way it does in the face of man-made and natural resource constraints. But most importantly, it can give clues as to how to develop strategies that would help rural areas overcome marginal situations by creating pathways that alleviate neglect by man and nature.

1.2 Objectives of the Research

The main objective of this research is to analyse the vegetable production and marketing of indigenous people in Benguet, northern Philippines using a new institutional economics approach. The study focuses in particular on the four levels of institutions -social embeddedness, institutional environment, governance structures and resource allocation – and on the structure, conduct and performance of the vegetable sector. Since commercial crop production and a unique indigenous culture characterise northern Philippines, the institutional economics perspective, an approach that recognizes the importance of social- alongside economic-analysis is the ideal chosen framework for the research. From this broad objective five specific objectives are defined and addressed in the subsequent core chapters of the thesis;

1. To characterise and obtain a better understanding of the vegetable production and marketing sector with respect to the institutional environment, governance structures and resource allocation and in relation to the sector's structure, conduct and performance (Chapter 4);

2. To determine the social capital of farming communities and evaluate factors that influence it, (Chapter 5);
3. To identify and characterise governance structures and their transaction attributes; and to determine the transaction-cost-minimizing alignment of contracts and governance structures based on transaction attributes (Chapter 6);
4. To determine and evaluate factors affecting farmer's decision-making with regards to selecting trading partners and their governance structures for vegetable trade (Chapter 7); and
5. To draw conclusions and formulate tailored agro-ecological and socio-economic strategy options for the improvement of the Benguet vegetable production and marketing system based on research results (Chapter 8).

1.3 Research Questions and selection of research theme

1.3.1 Research Questions

The specific research questions that the study will attempt to resolve are as follows:

How is vegetable production and marketing conducted in Benguet?

The answer to this question provides an overview of production and marketing structure in Benguet and consequently, how these activities are conducted. The analysis is conducted within a combined *Economics of Institutions* framework (Williamson, 2000) and *Structure-Conduct-Performance* approach.

What is the social embeddedness level in the farming and trading communities of Benguet?

In an attempt to answer this question, municipal, provincial, farmer and trader social capital levels are investigated. Cognitive and structural social capital is examined and the elements comprising their formation are evaluated.

What are the existing marketing arrangements and governance structures in Benguet vegetable markets and how efficiently aligned are they?

The research identifies the types of governance structures farmers choose from to sell their crops. Critical transaction attributes and their corresponding transaction costs are examined. This step-wise analysis is important in order to determine if governance structures are optimally aligned with contracts, based on the optimal alignment of transaction attributes and contract types.

Can a model clarify what propels farmers to select certain governance structures for marketing their crops?

Using answers from the previous two research questions, the research tries to build a model that would explain how and why farmers choose the types of governance structures that they use for marketing crops. Several variables are used to see which ones are significant in the decision-making process.

1.3.2 Selection of Research Theme

Transaction costs incurred by market participants arise from the type of governance structures and the attributes of transactions they use for exchange. The manner in which governance structures operate is influenced by the institutional environment in which transactions are staged. The structure of the institutional environment can be traced back to the community's social capital levels.

In Benguet, the cultural significance and evolution of traditional marketing arrangements required trust to play a major role in market transactions (Milagrosa, 2001). In certain contexts, trust is critical in initiating a transaction and in overseeing its completion. However, the dimensions and influence of trust and in general, social capital, on the mechanisms of Benguet agricultural sector are unknown. The effect of existing governance structures, institutional environment and social capital levels on the functioning of the vegetable industry is largely undetermined.

An important contribution of this research is the fresh insight on Benguet vegetable marketing in light of social capital, market institutions and governance structures. The analysis of transaction attributes determines the efficiency of each alternative organisational mode. What is unique with this framework is that it takes into consideration socio-economic and cultural conditions existing within the system. Developing a tailor-made institutional framework for the vegetable market is necessary in order to maximise farmer-trader income and welfare, and to make the Benguet vegetable industry efficient and competitive.

1.4 Structure of the Thesis

The research is composed of three parts. Part one consists of Chapters 1, 2 and 3. These chapters will provide the general introduction about the study and discuss theoretical underpinnings of the research.

The conceptual framework is developed in Chapter 2. In this chapter, the theories underlying the research are discussed. The theories are presented in a chronological manner, since the approach used attempts to develop a picture of the vegetable industry using various levels of social analysis as introduced by Williamson (2000).

Chapter 3 elaborates on the methodological approach used by the study. The discussions focus on the research design and data management and analysis conducted afterwards. Specifically, the selection of the research area, sampling procedure, questionnaire formulation and strategies used for data gathering is reviewed. A short explanation of the various statistical procedures used for data analysis is provided.

Part two of the research is composed of Chapters 4, 5, 6 and 7. These chapters show survey results and an analysis based on the pillars of the research, specifically, institutional environment, social capital, attributes and costs of transactions costs and modelling farmers' decision-making with regards to contract choices.

In Chapter 4, the combined *Economics of Institutions* framework of Williamson (2000) and the *Structure-Conduct-Performance* approach is used to provide an overview of the vegetable sector from an institutional economics perspective. The

institutional environment, governance structure and resource allocation levels of Williamson's schema is combined with structure, conduct, and performance analysis respectively.

Chapter 5 is a chapter where municipal and provincial social capital levels are calculated and confronted with specific demographic parameters.

The attributes of transactions, as laid down by governance structures are presented in Chapter 6. More efficiently aligned governance structures based on transaction attributes of asset specificity, frequency and uncertainty are presented.

In Chapter 7, the compelling reasons motivating farmer decision-making on governance structures are modelled. Detailed discussions on the implications of significant factors towards farmers' selection of distribution channels are carried out.

The last part of the research is Chapter 8. This chapter summarises important results of previous chapters and presents an overall picture of the Benguet vegetable industry from an institutional economics perspective. Some conclusions and strategy options drawn from research results are discussed. The chapter ends with suggestions for follow-up research.

Chapter 2: Theoretical and Conceptual Framework

2.1 Introduction

In this chapter, the theoretical framework that will be followed and applied to the succeeding chapters of the thesis is developed. In developing the framework, two analytical approaches are combined into one structure in order to obtain a deeper insight on the social, economic and institutional economic nature of Benguet vegetable production and marketing. Specifically, the *Structure-Conduct-Performance* (SCP) approach was positioned to operate within Oliver Williamson's *Economics of Institutions* (2000: 597) framework. As will be discussed in more detail in the next sections, the resulting new framework examines society in four interrelated levels of society (the social embeddedness level through social capital, institutional environment, governance structures and resource allocation). In addition, at the lower three levels, the appropriate evaluation using the structure, conduct and performance analysis is carried out.

The new combined framework provides the groundwork for the concepts to be used in the most important chapters of the thesis (in particular, Chapters 4, 5, 6 and 7). As a result, in the subsequent core chapters of this book, research questions that were presented in the introductory chapter will be analysed within the context of the new combined framework that is developed in this section. After explaining the similarities, differences and significance of combining the two connected theoretical frameworks, the rest of the chapter is devoted to the explication of the key concepts supporting the schema.

2.2 Development of framework for analyzing Benguet vegetable sector

As presented in the three-dimensional Figure 2.1, there are four levels of social analysis depicted by Williamson (2000), with each level addressing a specific social issue. On the boxes are the names of the four levels of social analysis. They refer to the branch of economic thought that the research draws upon.

On the highest level (Level 1) of Williamson's diagram is where Social Embededdness is located. Social Embededdness - in which change occurs at the rate of centuries to millennia - refers to customs, traditions and societal norms (Williamson, 2000: 597). At a lower level (Level 2) is the institutional environment that refers to the formal and informal social rules. The institutional environment which is often referred to as the "rules of the game", changes at the rate of 10 years to a century. At Level 3 is the governance structure level that refers to the "play –or organization - of the game". Change in the governance structures occur more frequently, at the rate of one year up to a decade. At the lowest level (Level 4), is the resource allocation level where change is continuous. Resource allocation refers to, among others, prices and production quantities. The downward moving arrows from each level of analysis indicate that the higher social level impinges constraints on the lower level. This means that for example, the institutional environment (Level 2) sets the rules of the game for the governance structures (Level 3), the play of the game. The upward moving arrows signify feedback from the lower level.

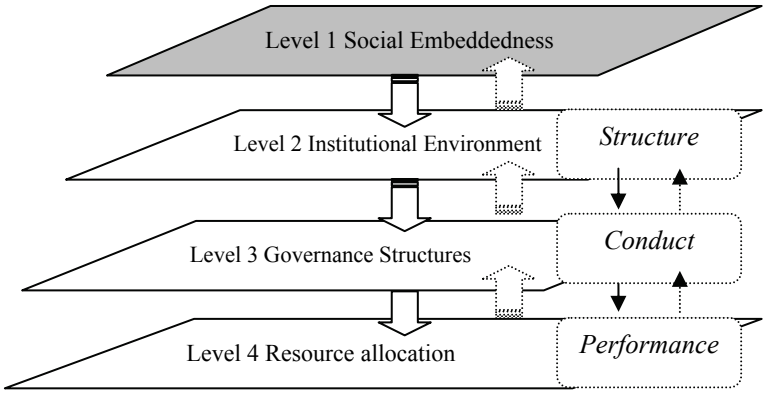

Figure 2.1 Integrated *Economics of Institutions* and *Structure-Conduct-Performance* (SCP) framework

Aside from viewing the vegetable industry from an institutional perspective, it will be analyzed using the *Structure-Conduct-Performance* (SCP) paradigm. This approach was first used by Mason (1939) and Bain (1951) to account for inter-industry differences in profitability. The basic premise of SCP is that **structure** (number of farmers and traders, number and composition of vegetable markets, quality and quantity of infrastructure support) affects **conduct** (production and marketing practices including pricing) and finally, conduct affects **performance** (prices, quantities and income). The procedure provides a good reference framework for the research because it allows a straightforward measure of market efficiency. Vegetable marketing in Benguet and Mt Province has been subjected to simple SCP analysis by Lizarondo *et al*. (1982). More recently, Tagarino (2001) successfully used the paradigm to examine the vegetable seed industry of the Philippines. The SCP approach is used as an additional framework for this research.

As illustrated in the figure, the *Structure-Conduct-Performance* (SCP) paradigm is combined with Williamson's *Economics of Institutions* approach in order to create one framework. Specifically, analysis of the **structural** aspect was combined with the institutional environment level. **Conduct** is situated in the governance structures level while **performance** is brought into the resource allocation level. Similar to the framework of Williamson, the downward moving arrows mean that the higher level influences the lower levels while the upward moving arrows indicate that there is feedback in the system.

Although elements of the different levels of Williamson's Economics of Institutions possess similar attributes with elements in the Structure Conduct Performance framework, the two are not one and the same. The main focus and therefore, the main results of each level of Williamson's paradigm is substantially different from the focus and findings of the SCP approach.

Hence, independently, the two elements already provide a strong theoretical and methodological approach to analysing the vegetable production and marketing sector of Benguet. However the two approaches were combined for a reason: putting the two frameworks together in one single schema provides deeper insight via reciprocal validation. This is due to their analogous and divergent elements of analysis. The

approaches' findings validate each other but also at the same time, supplement in the analysis where the other method is deficient in. In short, incorporating the two approaches into one allows a more thorough analysis than using them singularly. The following two subsections justify the theoretical and applied importance of combining the two schemas by exploring where the two approaches overlap and diverge.

2.2.1 Similarities between the Williamson and SCP approach

The Williamson and SCP approaches overlap in a number of ways. First, they both work on the premise that levels affect each other by providing constraints or by influencing the outcome of the next level. In Figure 2.1, upward and downward moving arrows signify the interrelatedness of each level of each schema. Williamson (2000: 596) in describing his framework, argued that the arrows connecting higher and lower social analysis levels signify constraints and feedback respectively. Cabral (2000: 12) stated that the underlying belief in the SCP approach is that there is a causal chain in the preceding components of the framework and that causality also works in the opposite direction. Williamson indicates that in the long run his system is fully interconnected, and same case is argued by proponents of the SCP.

Second, some individual components in the Williamson and SCP framework tend to have similarities in their analytical function. Referring to Figure 2.1, we see for instance, that the institutional environment level (Level 2) of Williamson's framework is comparable to the structural aspect of the SCP. The institutional environment constrains individuals by providing formal and informal rules by which societal economic and political exchange should abide with. Slangen (2005: 17) argues that the institutional environment effectively "*defines the selection set*" by which people in society can conduct exchange and influences the "feasibility and profitability of economic activities". Argued this way, structural characteristics of the vegetable sector, with standard economic constraints, also defines the selection set of farmers and consequently dictates profitability. For example, the current structure of small farm sizes and fragmented distribution of farm land in the province of Benguet is as much a result of ancestral laws as modern land distribution schemes of the local governments. The institutional environment is in part responsible for the current structure of farm lots; but at the same time both the institutional environment and the *structure* effectively constrains production and feasibility of economic activities in an intangible (rules) and tangible (physical limitations) sense. Furthermore, many aspects that are dealt with in the structure part of the SCP, for example, land distribution, land size, number of farms; and marketing infrastructure require a long period of time before change in them can occur. In a similar fashion, Williamson contends that the institutional environment which is a product of evolution and political action, changes very slowly, at a rate of every ten years to every century.

The conduct part of SCP and governance structure (Level 3) of Williamson should not be interchanged by the reader because these two aspects of the frameworks have distinct attributes. Governance structures describe the manner in which exchange between parties are carried out while conduct describes the behaviour of the elements involved in the transaction. The kinds of governance structure created that are used in social, economic and political transactions are based on the institutional environment within which they were formed. On the other hand, how people behave in vegetable production and marketing is dependent on the structure of the situation in which they

have to work in. For example, a *laissez faire* type of institutional environment results in several possible governance structures that the farmer can choose from when marketing harvests. Similarly, having several satellite markets that operate independently from the central trading post allows the farmer to sell produce in any location and conduct trade in a manner that he chooses. According to Williamson (2000: 599), institutions of governance attempt to create order, mitigate conflict and realise mutual gains. The same objective holds true for the conduct part of the SCP: stakeholders of the vegetable industry conduct production and marketing with the intention of maintaining order, dealing with conflicts in case it arises and increasing income of all involved. The governance structure and "conduct" also has a comparable "time path". Change within the vegetable production and marketing conduct can be initiated from one cropping season to the next, or in stages, within several years. Meanwhile, changes within the governance structures occur at the rate of 1 to 10 years.

At the last level (Level 4) of the Williamson and SCP frameworks are resource allocation and performance, respectively. The similarities between both approaches should be clear: the objective of both levels is to measure efficiency based on information gathered on the higher levels that were presented before them. Both schemas concurs that changes and adjustments in resource allocation and performance occur continuously. In analysing productive and allocative efficiency both approaches make use of marginal analysis, describing the firm in terms of production functions. ***Because of these complementary overlapping characteristics, the analysis of the Benguet vegetable sector using a combined approach is given more depth.***

2.2.2 Differences between the Williamson and SCP approach

As mentioned earlier, the two schemas are not interchangeable. The Williamson and SCP frameworks also differ in several important points. In his framework, Williamson heralds a higher Level 1, named social embeddedness that sets the conditions within which the institutional environment is shaped. The social embeddedness level, which takes centuries to form, preconditions the institutional environment. Although modern socio-economists, argue that a higher level, termed "Basic Conditions", should be set above *structure*; according to most proponents of the SCP schema, the *structure* part is already the highest level of the SCP approach. Basic conditions when used, would present elements that are considered as given, in a similar way as social embeddedness part of Williamson's framework.

While the **structure** deals with the specific number and size of farms and farmers, the geographical distribution of production and market infrastructures, land ownership and tenure, mechanization and vertical integration; the **institutional environment** deals with intangible aspects such as formal rules and informal norms.

In the same vein there are differences between Level 3 and the conduct part of the SCP approach. **Governance structures** refers to the manner in which production and marketing activities are organized among interested parties but conduct goes beyond exchange between parties. **Conduct** analysis involves not only looking at governance structures but also cropping practices of the farmer, marketing practices of traders, and sources of credit, pricing policies and price setting behaviour. Conduct analysis answers questions regarding transparency and fairness of contracts between farmers

and traders as well as the ease of entry and exit of farmers and traders into the vegetable industry.

Governance structures also partly determine the conduct. This is because, once a certain governance structure is chosen, the activities that are performed thereafter are based on the way in which the governance structure should be carried out.

Although **resource allocation** at Level 4 and performance both refer to quantities, prices, margins, costs and shares, Williamson refers towards getting the marginal conditions right (optimality) using neoclassical economic analysis as the purpose of this level. **Performance** analysis also involves identifying the barriers to achieving efficient production and marketing, analysing if prices behave in economically rational fashion with regards to seasons and geography and if signs of growing economic inequality are visible. ***It is exactly because of the differences in the elements of the combined approach, that the analysis of the Benguet vegetable sector using this schema is given more breadth.***

Finally the two frameworks are interrelated in several respects. The **structure** is in a way, determined by the social **embeddedness**. As an example in Benguet, the manners in which many farms are owned or partitioned in the region were determined by ancestral ownership. Currently, "ancestral domain claims" hold not only traditional but also legal credence in the province and for this reason, involves the institutional environment as well. The **conduct** is determined by the social embeddedness, the institutional environment, but also the structure of the sector. The way in which vegetable production and marketing is conducted is dictated not only by culture or tradition or by municipal regulations. Farmers are implicitly constrained by available resources at their disposal, which can be traced in the structure of the sector. According to the framework, the performance of the vegetable sector is determined by the structure and conduct levels above it. However, performance can ultimately be traced to how the transactions in the market were executed. The transaction process itself refers to the play of the game (governance structures), the rules of conduct (institutional environment) and the social embeddedness.

The two interconnected frameworks will serve as the basis on which the remaining important chapters of the thesis are anchored. As an overview of how the framework will be utilised: in Chapter 4, the institutional environment is discussed with special emphasis on the structure-conduct and performance of vegetable production and marketing in the province.

In Chapter 5 the social embeddedness which impinges constraints on the institutional environment, is explored. Specifically, social embeddedness is analyzed using social capital theory. In Chapter 6, the conduct of vegetable production and marketing in the province is analysed with emphasis on governance structures in vegetable trade. Resource allocation and market performance are again taken up in Chapter 7 when a model is developed to determine how farmers make use of available resources and other factors to choose governance structures.

2.2.3 Analysis Level 1: Social Embeddedness

The very first level of social analysis is called the **social embeddedness level**. In the thesis, social embeddedness will be analyzed using social capital theory. The research question that refers to this level is: ***What is the social embeddedness level in the farming and trading communities of Benguet?*** According to Williamson (2000: 596), the social embeddedness level is taken as given by many institutional economists because it requires decades, even centuries, to change. In this thesis, a distinction is made between the social embeddedness level and the institutional environment. The social embeddedness level is specified and analyzed in the form of social capital shared in the vegetable farming communities of Benguet.

Social Capital consists of observable but non-contractual elements such as trust (considered by many social-economists as the most important social capital element), shared norms, and social networks (Slangen, 2005: 25). These also include volunteerism, reciprocity, associatedness, formal and informal organization, traditions and beliefs. Social capital is used to capture the phenomena underlying behavioural problems, organization, community life, democracy and governance, and more recently, economic development and collective action. Presented in Table 2.1 are the varied definitions forwarded by social capital researchers through the years.

Table 2.1 Social capital definitions

Source	Definition
Serageldin and Grootaert (1999:44)	"A glue that holds societies together"
Putnam (1993)	"A set of horizontal associations including networks of civic engagement and social norms that have an effect on the productivity of the community"
Coleman (1998)	"A variety of different entities with two common elements: some aspect of social structure, and the capability to facilitate actions of actors within the structure"
North (1990) and Olson (1982)	"social structures plus the socio-political environment including formalised institutional relationships that enables norms to develop"

Source: Serageldin and Grootaert (1999)

From Table 2.1 it can be observed that that social capital can be simple or complex, depending on its definition and dimensions being observed. Several aspects of social capital can be studied without fully encompassing the totality of its sense.

Social capital is acknowledged by many as an important factor behind economic development (Beugelsdijk and Schaik, 2001: 4). Social networks have been proven to positively or negatively influence economic performance and aggregate productivity (Arrow, 1999: 3; Solow, 1999: 6). Empirical work by Putnam (1993) confirmed the important role of horizontal networks in northern Italy's economic growth while strong vertical relationships in the south explain this region's relatively slower growth. Putnam suggested that trust, norms and networks boost economic and institutional machinery. Voluntary co-operation is necessary in order to facilitate contracting and monitoring among participants. Voluntary co-operation can be drawn

from trust - while trust on the other hand - develops from reciprocity and networks of civic engagement.

Social capital can be likened to other forms of capital in the sense that it is a resource into which other resources can be invested with the anticipation of a future benefit. Increasing social capital by investing in worthy relationships with other people in the community can lead individual and collective actors to gain access to important knowledge, power, encourage collective behaviour and strengthen collective identity. Repeated interaction will lead transacting partners to discover who to trust and how their actions affect each other. Shared norms and patterns of behaviour due to their localized setting develop social capital build-up over time. This can be drawn from later to resolve conflicts at community level (Ostrom and Ahn, 2001: 9)

An important form of social capital is reciprocity. According to Putnam (1993), networks are a necessary precondition for reciprocity. Trust is an integral part of reciprocity because a person who reciprocates one good action for another becomes trustworthy. Trust is the most far-reaching and most important element of social capital since almost all societal transactions involves some level of trust (Slangen, 2005: 25 and Dasgupta, 1988). If people within a community reciprocate good deeds for each other, it is a general indication that a considerable percentage of the citizens are trustworthy. According to Putnam, norms of reciprocity and networks of engagement build up trust. When people repeatedly reciprocate good actions to one another, opportunistic behaviour is restricted and trust is built. The same result is achieved in social networks that enhance repeated exchange and reciprocity.

In any transaction, trust with the partner is always involved. The type of governance structure used to organize transactions in a community is influenced by informal and personal connections between transacting parties. Solow (1999: 8) adds that since contracts are almost always incomplete, trust plays a crucial role in lowering transaction costs. Costs involved in information search become lower as networks facilitate information transfer among its people. Social capital works by increasing communication, inter-action, information transfer and co-operation between transacting partners without the influence of power and market. Defensive behaviour among participants is reduced and parties expect non-opportunistic behaviour from each other. Having repeated interactions among transacting parties increase trust levels and this is translated in the types of contracts drawn up. With trust, enforcement and monitoring costs are considerably less thus transaction costs decline. Arrow (1999), Fukuyama (1995) and Williamson (1985) agree that trust and contracts are to some extent, substitutes. Therefore, overly specific and detailed contract means that there is little trust between business partners and vice versa.

Putnam (1993) indicated that participation in informal type of associations such as sports clubs, religious and community organisations, educational and cause-oriented groups increase the level of connectedness and networks. A network among peers is said to help propel the economy since people do not look at society as an arena for pursuing personal interests (Beugelsdijk and Schaik, 2001: 8). Therefore it is predicted that high levels of farmer and trader participation in civic organisations will result in high levels of associatedness among people in the community. Through the creation of networks, collective action in the pursuit of common goals overrides temptations to achieve goals for personal wealth and limits free-riding. Knowledge

and information transfer is easily disseminated, decreasing the occurrence of information asymmetry, opportunistic behaviour, and lowering transaction costs. Due to familiarity and a sense of looking after people within the network, voluntarism is high.

There are some negative effects of social capital. The World Bank noted such as exclusionary social capital, where the exclusion of others to enter the network is high. This makes the network sparse and exclusive. This occurs in tribal communities strongly tied by their culture or in elite societies that are highly selective of members. Another negative social capital effect is the build-up of community pressure on some individuals to perform activities they would otherwise not do or the creation of conflicts among people of different networks with strong distinct social capital. Collectively these are referred to as negative social capital.

2.2.4 Analysis Level 2: Institutional Environment

At the second level of analysis is the institutional environment. The research question that refers to this level is: ***How is vegetable production and marketing conducted in Benguet?*** The institutional environment consists of formal rules and informal constraints. These define the "*rules of the game"* (North, 1990; Williamson, 1998: 27). In relation to the study area, the institutional environment refers to the rules of how vegetable exchange in Benguet should be conducted. On the formal side, this consists of private and public orders, policies, regulations, and property rights issues. Conventions, customs, traditions, common values and norms comprise the informal side (North, 1991: 97).

The institutional environment plays a significant role in shaping events at the downstream or governance level. With good institutions a more favourable environment supporting economic growth is created. Well-organized institutions translate into good governance structures (Slangen *et al.*, 2004: 247). Good institutions and good governance structures contain efficient information transfer mechanisms that result in appropriate decisions among parties involved. Economic development and good institutions are mutually occurring reciprocal phenomena. On the one hand, economically developed areas demand *for* and contribute *to* good institutions. On the other hand, a good institution creates economic development.

Formal rules encompass a variety of concepts. Farmers and traders need protection from the local government to hedge against trader opportunistic behaviour. Most interventions are price and pricing strategies although some extend into rules and regulations governing transactions. The types of protection mechanisms and the manner in which the local government arranges these for farmers and traders are translated into the formal rules of institutional environment. Due to bureaucracy, governments differ in policy implementation methods.

The amount of institutional support in terms policies and regulations towards vegetable production and marketing reveals the extent of the government's assistance to the sector. Vegetables' perishable nature calls for infrastructures that maintain its quality until it consumers are reached. Provision of transportation, storage and marketing facilities are important clues that suggest if the government operates well in support of agriculture. Good farm-to-market roads signify local government's

intentions of increasing grower's income. On another level, the provision of specially assigned offices that deal with agriculturally related issues is important. For example, government sponsored radio programs, on site extension services, training and seminars, bulletin boards and newsletters reflect governmental support. Finally, critical factors such as financial subsidies and taxes, and agriculture-related expenditures play strong roles in the institutional environment.

The institutional environment's informal rules overlap with aspects of social capital. Informal sanctions in the institutional environment consist of non-political, non-economic and unwritten conventions such taboos, traditions, customs and norms. These are also embraced within the social capital context. The two are linked because institutions establish incentives for people to act trustworthily by their means of reward and punishment. Institutions can supply information, advice and provide alternative conflict resolution mechanisms encouraging parties to co-operate and behave in a trustworthy manner (Ostrom and Ahn, 2001: 20).

It is difficult to reform informal rules that have evolved and embedded themselves in society. Unfortunately, in some cultures rich in tradition, a few customs are detrimental to economic growth. Certain tradition - small actions that people do that does not appear to have any effect when done individually - may have potentially damaging effects when done by the whole community. Some negative customs might be sustained and upheld by powerful stakeholders who live off the inefficiencies of the system. However, institutions that try to establish a formal system that repels informal rules almost always produce negative results because of tension between altered formal rules and existing informal rules (Saleth and Dinar, 2004: 27).

2.2.5 Analysis Level 3: Governance Structures

The governance structures or "*play of the game"* is at the third stage of social analysis in the framework. The research question that directly refers to this level is: ***What are the existing marketing arrangements and governance structures in Benguet vegetable markets and how efficiently aligned are they?*** A second related research question is: ***Can we clarify what propels farmers to select certain marketing arrangements and governance structures for marketing their crops?***

Governance structures are the ways of putting into action the framework for operations outlined by the institutional environment. Ménard (1997: 35) defines it as "*ways to implement and operationalise the rules of the game as defined by the institutional environment*". In Benguet, there are three main types of marketing arrangements and contracts that farmers employ when selecting selling vegetables. The first one is the commissioner-led arrangement using classical contracts, the second, wholesaler-led arrangements using neo-classical contracts, and the third is the contractor-led arrangement using relational contract. The first marketing arrangement is governed by the market, and price is the coordinating mechanism between commissioners and farmers. The second arrangement is governed by the market and partly by credit arrangements between farmers and wholesalers. The third governance structure is governed by personal relations between farmers and contractors while the

market and prices play a minor role in the transaction[3]. There are salient differences among the three governance structure types but the fundamental difference lies in the amount of coordination control given to the transacting parties' vis-à-vis the role of price as a coordinating mechanism. Neoclassical contracts have higher level coordination control than the more market-based governance (cf. Peterson *et al.*, 2001 :2). These are discussed and analyzed more thoroughly in Chapter 6.

Markets are decentralized decision-making and exchange institutions where the price-system is *the* coordinating device (Williamson, 1987: 16). In markets, prices allocate resources; partner identities are not transaction-decisive. In markets, prices are determined by competition among buyers and sellers and prices contain all the information needed to determine how much should be produced and who gets the output (Douma and Schreuder, 1998: 8). According to neoclassical economic theory, a perfectly competitive market has the ability to allocate resources and set prices towards production and exchange efficiency (Furubotn and Richter, 1991: 6-7).

Market failure is one of the necessary (but not the solitary) justifications for increased hierarchical control. Increased control measures could be in the form of full vertical integration/in-house production or government intervention[4] (see Milgrom and Roberts, 1992). Vertical integration (hierarchies) or government intervention is considered the other extreme of the governance structures spectrum, opposite that of the market. In vertical integration, all the control is made by one unit, because transacting parties find it more efficient to unite and decide as one entity. The same holds true for in-house production; the government is regarded as a single entity responsible for overseeing all activities within a single organization. Decisions related to ownership, planning, management, financing and production are made by one unit or one person, in the case of firms or governments with centrally planned economies. In this view, hierarchies and other mechanisms of vertical co-ordination replace markets when the price co-ordination system fails. Coase (1937) distinguished organisations as alternatives for carrying out transactions. Instead of prices, authority is the main coordinating mechanism. ***The choice of governance structure depends on which co-ordination mechanism entails the lowest relative transaction cost.*** In other words, transactions will shift between markets and organisations as a function of the transaction costs of these two alternatives (Douma and Schreuder, 1998: 11).

After much criticism, Williamson (1985) identified the hybrid as a third form of organization between the market and hierarchy. Hybrids vary in the form of contractual agreements entered into by the parties. Ménard (1997: 35) describes a hybrid form as a "*specialized governance structure that deals with bilateral dependency without going as far as integration*". This intermediate form of governance possesses the combined characteristic advantage of the market and vertical integration. Based on some key attributes, an optimal governance structure can be aligned for each type of transaction. Lyons and Mehta (1997: 47) argues that depending on transaction characteristics, it is possible to reach an efficient contract

[3] Following Williamson (1985, 1991, 1998) and Menard (1987), the commissioner-based vegetable marketing is classified as market based while wholesaler-based and contractor-based marketing are classified as hybrids. Price begins to minor role in the relationship as one goes from commissioner to wholesaler to contractor governance.

[4] In market failure, it is not only the government that can take action to set things right, individuals and firms can also take action (Milgrom and Roberts, 1992:77)

type that will lead to efficient exchange governance. Each mode of alternative governance has its own transaction characteristics, different coordinating mechanisms and different abilities to adapt to disturbances (Williamson, 1991: 269).Thus in reality, hybrid governance structures are more prominent than the other two types because of their ability to adapt to specific transaction requirements. To determine which contract type is optimal for a transaction, three transaction characteristics must be noted: *asset specificity, frequency* and *uncertainty.*

Asset Specificity relates to the amount of money, time and effort put into the transaction by the transacting parties. Degree of asset specificity is a good measure of the vulnerability of the investing party to opportunism. The bigger and more specific the investments of one party are the more vulnerable the investor is to opportunistic behaviour, hold-up and sunk costs (Lyons and Mehta, 1997: 47; Verhaegen, 2001: 23). This is particularly true when the investment is highly specific or has few alternative values. Opportunistic behaviour occurs in cases when one party highly depends on another's products as necessary inputs for his production process or when one party invests on specific technologies at the behest of their transacting partner. In the first case, the dependent party may be exposed to opportunism when the other party refuses to meet with the agreements unless a new more advantageous agreement has been renegotiated in his favour. This result in the other party being "held up" because production can not continue without the necessary input and time is short to look for another governance structure. In the second case, when the trading partner refuses to transact, the investing party is left with huge financial liability. One party becomes vulnerable to opportunism because of a special investment in a technology that is useful for a specific purpose (and oftentimes), for a specific governance structure only. To prevent opportunism, a special contract is necessary.

Frequency relates to the recurring nature of the transaction over time (Verhaegen, 2001: 27). Transactions could be occasional or recurrent. *Frequency* is confronted with asset specificity in order to find a match of the optimal governance structure for any type of transaction. Verhaegen argued that recurrent transactions would lead to routines between transacting parties, a decrease in transaction costs and fewer incentives to act opportunistically.

Uncertainty comes in two forms: behavioural uncertainty from transacting partners (endogenous uncertainty) and uncertainty posed by the transaction environment (exogenous uncertainty) (Verhaegen and van Huylenbroeck, 2002: 26). Endogenous uncertainty results in performance evaluation problems while exogenous uncertainty leads to problems specifying transaction terms (Rindfleisch and Heide, 1997: 31). Note that exogenous uncertainty is related to transaction attributes *ex ante*, while endogenous uncertainty is relevant to transaction attributes *ex post*. With regards to this attribute, the more uncertain the future trading environment and partner behaviour is, the better it is to take up a contract that can adapt to unforeseen events that may arise in the future.

Williamson (1991: 269; 1998: 31-37) stated that specific governance structures are appropriate for specific transactions. **And, that the evaluation of critical transaction attributes will determine the most efficient governance structure that would oversee the transaction.** In other words, *the transaction itself (more specifically, the attributes) is the basis of analysis*. The proper choice of organization results to cost-

effectiveness, transaction efficiency and risk reduction for transacting parties. **Most importantly, determining the optimal governance structures leads to transaction cost economising results**. This means that the cost of doing the transaction would be minimized.

2.2.6 Analysis level 4: Resource allocation and employment

At the fourth and lowest level of analysis is resource allocation and employment. The thesis will not intensively highlight this level of social analysis because we would like to put more rigorous attention on the first three levels. Therefore, there is no direct research question formulated to address this issue. However, this level is tackled by focusing on aspects that evaluate market performance. The performance evaluation is based on results of previous analysis of vegetable market and marketing features as well as direct survey results. Particularly, we discuss quantities produced and marketed, production and marketing costs and price analysis in the form of farmer's and traders' share of total market sales.

In this level, neoclassical economics operates most often in the form of marginal analysis (Williamson, 2000: 600). Market optimal situations are sought based on continuously changing market conditions. Prices are likewise assumed to constantly adapt and change.

The four levels of social analysis represent a framework in which Benguet vegetable production and marketing could be systematically evaluated. The research approaches analysis at the highest level, systematically proceeding until reaching the lowest resource allocation level. The reason for this approach is because; beginning at the social embeddedness level enables one to create a clear picture of the culture and the social environment in which the players operate. Once this knowledge is at hand, it is easier to comprehend the institutional environment and resulting governance structures governing vegetable transactions. The researcher will understand how and why the market operates the way it does. Once this is clear, better and more tailored strategies on how to get marginal conditions right can be developed. Thus, one need to come down from the ladder level-by-level to understand the vegetable production and marketing system but needs to go up the ladder in the same manner in order to get the conditions right.

2.3 Conclusions

In this chapter, we developed a framework for analyzing the Benguet vegetable production and marketing system. Williamson's *Economics of Institutions* approach with the *Structure-Conduct-Performance* (SCP) approach. The schema will provide background information on the province from a new institutional economics perspective and serve as the main analytical framework for the remaining core chapters of the thesis. The framework itself will be applied in Chapter 4 and will provide the groundwork of the most important pillars of the research described in this thesis.

At the first level, social capital theory was proposed to analyze the social embeddedness level. At the second level, the institutional environment comprising of formal rules and informal social regulations was incorporated with the *structure* part

of the *Structure-Conduct Performance* (SCP) approach. At the third level, governance structure analysis was combined with the *conduct* of the SCP. At the fourth level, resource allocation was incorporated with *performance* analysis of the SCP. The developed framework was justified by discussing the similarities and differences of each approach

The research question posed in Chapter 1: "What is the social embeddedness level in the farming and trading communities of Benguet" is tackled with analysis at Level 1 of Williamson's *Economics of Institutions* framework. Social embeddedness as analyzed in the form of social capital is an observable but not contractual social element that binds people together. These come in the form of trust, networks, volunteerism, norms, taboos and traditions. Social capital is discussed more deeply in Chapter 5, where a baseline study of the social capital of the farmers and traders surveyed was conducted.

Analysis at Level 2, the institutional environment, will answer the research question "How is vegetable production and marketing conducted in Benguet?". Strictly speaking, the institutional environment discusses intangible aspects such as formal rules and informal constraints with regards to vegetable production and marketing. The incorporation of the *structure* part of the SCP into this level allows us to also analyse the physical limitations confronting production and marketing in the province.

At Level 3, governance structure level, we look at how vegetable production and marketing in the region is conducted. New Institutional Economics restricts governance structure analysis in terms of determining the most efficient manner to organize transactions based on transaction attributes. With the development of a new framework, we are also able to analyse how vegetable production and marketing is conducted, from a non-institutional economics point-of-view, through the *conduct* part of the SCP. In studying Level 3, we attempt to answer two research questions that were initially posed in Chapter 1. The first research question is: "What are the existing marketing arrangements and governance structures in Benguet vegetable markets and how efficiently aligned are they?". This will be answered in Chapter 6 of the thesis. The second research question is: "Can we clarify what propels farmers to select certain marketing arrangements". The question is resolved in Chapter 7 of this thesis.

At Level 4, resource allocation level, we attempt to look into farmers' and trader income, costs, sales and market shares when we combine the approach with the *performance* part of the SCP framework.

Creating a combined *Economics of Institutions* and *Structure-Conduct Performance* (SCP) framework allows the research to systematically analyse vegetable production and marketing in Benguet from two viewpoints: the theoretical and the applied. The two frameworks are not the same, and therefore, reciprocal validation of overlapping and divergent constructs of the two approaches gives depth and breadth to the analysis. Moreover, using the new integrated framework creates increased opportunities to discover issues that would not surface by using one of the frameworks independently. It is in discovering critical unique issues that more tailored strategy options can be suggested.

Chapter 3: Research Design, Data Collection and Analysis

3.1 Introduction

Information from individuals and written work are two of the key sources of knowledge for a research (Verschuren and Doorewaard, 1999: 114). These two sources were the main foundations of information drawn upon for this work. In order to gather the needed knowledge, personal field interviews were conducted and related literature was examined. The research followed what Malhotra (1996: 87-88) defines as a conclusive research. Conclusive researches are studies whose needed information is properly defined and where the research process is formal and structured. The sample size of a conclusive research is large and representative. Data analysis follows quantitative procedures. Conclusive studies such as the research described in this thesis test specific hypotheses and examine relationships.

In carrying out the survey, it was essential to find a good combination of scientific methods and resourcefulness. There were many issues to confront at several stages of the data gathering. The following sections in this chapter chronicle research strategies used for the data-gathering phase. Specifically, this chapter elaborates on the development of the questionnaire, the selection of the research area, the sampling procedure followed and the conduct of the survey (also referred to as primary data) itself. How the data was managed, and the different methods of data analysis were also discussed. A short mention of the various secondary data sources (information sources other than the survey) is made.

The chapter is structured as follows. In Section 3.2 the research strategy is elaborated. The first strategy details secondary information gathering and questionnaire construction while the second strategy discusses the conduct of the field interviews. In section 3.3 the research area and sampling procedure is explained. Data management and the methods for analysis are presented in 3.4. The chapter ends with summary and conclusions in 3.5.

3.2 Research Design and strategy

Figure 3.1 illustrates the methodological procedure that was followed by the study. Boxes on the left side represent the three major stages of the research while rounded rectangles depicts the detailed activities involved and output of that stage. The first stage involves defining the problem and identifying concepts that would aid in answering research questions. The result of the internationally accessible literature is the development of a framework that was used as a theoretical guide throughout the research process. The concepts were also used to construct a pre-test questionnaire that will be used in the second stage. The conceptual framework was presented in Chapter 1 and discussed in more detail in the previous chapter. The focus of the discussions here is the methodology employed to gather data as well as how the encoding and analysis was carried out. These refer to Stages 2 and 3 of the illustration below.

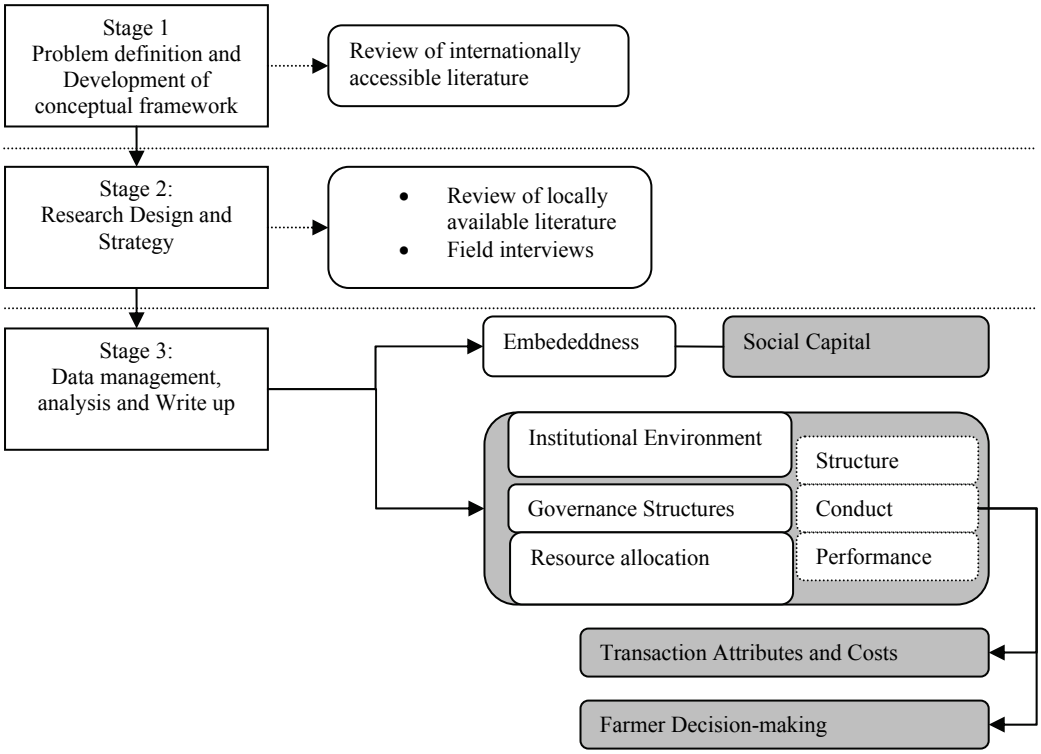

Figure 3.1 Structure of the research process, core chapters in grey ovals

Stage two of the methodology involves creating the research design and developing strategies to implement it. The design draws upon two sources of information: first, literature review was conducted in the Philippines to gather additional local data needed for the research. These secondary data sources are also useful in providing background information on the survey area. Second, the questionnaires constructed in Stage 1 were pre-tested, corrected, and put into final form before the actual survey was conducted. The field interviews are useful for validating or contradicting assumptions that were created from earlier literature reviews. Moreover, interviewing respondents allows the research to gather first hand (primary) information about the stakeholders involved in the study. Both sources of information complement each other to provide a clearer picture of the production and marketing systems in the province.

Stage three of the research process involves data analysis and write-up. The illustration shows the main outputs of Stage 3 which are later to become the core chapters of the research (shown in grey ovals). From the social embeddedness level, the chapter on social capital is written. The combined *Economics of Institutions* and *Structure-Conduct-Performance* framework results in the Institutional Economic and SCP analysis chapter. Further on two chapters are written that pertain to details of the marketing conduct part of the SCP; first, an analysis of transaction attributes and costs and second, a decision-making model.

3.2.1 Research Strategy 1: Secondary data sources and questionnaire

There are two methods of accessing information from literature. The first is content analysis where the data is generated from documents through a category system

(Verschuren and Doorewaard, 1999: 133). The second, more relevant method that was used for this research is the search method. The search method is a research strategy to get information from literature sources generated by others. The reason it is called secondary data sources is because data gathered were analyzed from a perspective in line with the own research's objective.

Reliable secondary data is in short supply in developing countries such as the Philippines; in comparison to data available in developed nations. Most of Philippine-sourced data with regards to vegetable production and marketing in northern Philippines came from Benguet State University (BSU), the provincial capitol and the Philippine National Statistics Coordination Board (NSCB, 2001). The rest were sourced from the internet, in the statistical websites of various government offices. The internationally available scientific materials used for this research were accessed from Wageningen University. They were in the form of articles from scientific journals, books, reports, handouts and reading materials from economic courses.

The questionnaire[5]

Secondary data sources served two purposes for this research. The first is to provide theoretical support and the second equally important, to aid in the creation of the survey questionnaire. The questionnaire was drafted after evaluation of several secondary data sources and consultations. It was formulated to respond to research questions postulated in Chapter 1. Thus it is composed of questions that would reflect the institutional environment, social capital, governance structures and transaction attributes and respondent characteristics.

Most of the questions were structured. Structured questions are those that have pre-specified sets of answers for the respondent to choose from (Malhotra, 1996: 330). They were in the form of multiple choice sets, dichotomous sets and scales. In other sections, questions were unstructured meaning; respondents had the freedom to provide whatever answer they felt was appropriate.

Two questionnaires were drawn up. The first questionnaire was exclusively for farmers. It included questions where technical data concerning vegetable production were requested. The second questionnaire was meant for traders. It included questions regarding their day-to-day trading activities. The questionnaire itself was pre-tested among farmers and traders in the La Trinidad area. Three days were required for pre-testing. After minor revisions based on enumerators, farmers and trader suggestions, the questionnaire was ready to be used.

Introducing the research questions

The final questionnaire for farmers and traders (see Annex) was designed to cover the following topics:

1. Institutional Environment/ *Structure*
2. Governance structures/ *Conduct*

[5] The two questionnaires, one for farmers and another for traders are available from the website of the Agricultural Economics and Rural Policy Group of the Social Science Department of Wageningen University. Go to http://www.aep.wur.nl/uk/downloads

3. Social capital
4. Vegetable production (for farmers); vegetable marketing (for traders) /*Performance*
5. Personal information

The first section dwells on the institutional environment and *Structure*. Respondents were asked semi-structured, mostly multiple-choice type questions that refer to formal marketing rules and their unwritten codes of conduct. To test if the institutional environment functions in favour of the market institution, structured multiple-choice type questions regarding conflict and conflict resolution were included in the questionnaire. As an open ended final question, suggestions were requested from the respondents with regards on how to make the institutional environment more supportive towards their cause.

The second section refers to the governance structures and *Conduct*. Multiple-choice questions relevant to this included the type of governance structures selected (by farmers) and the activities involved in the distribution channel of choice (for traders). These questions relate to the identification of the sources and types of transaction costs incurred by market participants. Transaction costs were indirectly measured in this manner because quantification and the separation of transaction costs is always a problematic issue in researches of this kind (Dow, 1993: 109; Dietrich, 1994: 23; Cheung, 1998: 515). Specifically, questions that measure the cost of transacting such as time needed to identify the trading partner, number of attempts to identify trading partner, knowledge of current vegetable prices as well as tendency to withhold information from trading partners were asked.

Social capital questions were asked in two approaches. The first approach was by using 5-point Likert scales. Questions were meant to reveal the respondent's core, external and general trust levels. Life satisfaction, formal and informal community associations and camaraderie among family, neighbours, and work mates were inquired. The second approach used 3-point scales measuring the level of their involvement with various formal and informal community organizations, their satisfaction and their trust towards the group. At the pre-testing stage, several types of organizations were listed among which farmers and traders were expected to participate. However, several of these were later omitted (and subsequently, other organizational types were added) in drafting the final questionnaire. Organization types that were removed included sports clubs, theatre groups, leisure-based associations and hobby-based organizations. These were later found out to not fit the cultural and social structure of the municipalities. Association types that were later added included farmers and trader's agricultural cooperatives, neighbourhood-watch groups and political-based organizations.

In the production aspect for farmers, structured questions with regards to inputs used for production and their corresponding estimated costs were asked from farmers. Total vegetable volume marketed in the season covered for the interviews was assessed from questions pertaining to the types of vegetable marketed and the farm prices (in pesos) received for each.

In the trading aspect for traders, respondents were asked to identify their primary and usual roles in the marketing process. The corresponding marketing activities involved

with their marketing roles were asked. How traders source their vegetables and their preferred market location for trading activities (La Trinidad, Baguio City or others) were requested. Specific marketing activities for each type of trader and their corresponding marketing costs were solicited. Commission rates, incomes, payment methods, delayed payments, financial support and written agreements were posed in the questionnaire. Follow-up questions regarding their reason for choosing their preferred marketing role were included.

Personal information was asked from respondents. Personal questions (yes/no) relating to off-farm source of income, vehicular and land ownership, educational attainment (in years), number of people in the household and ethnic affiliation was asked. Finally, peak and lean trading months were asked from traders in order to reflect it with peak and lean production months of farmers.

3.2.2 Research Strategy 2: Exploratory field interviews

The research followed what Verschuren and Doorewaard (1999: 149) calls a survey research. A survey research attempts to capture a general depiction of a phenomenon spread out over a period of time and space. The survey method was employed because the research aims to elicit specific information from the respondents (Malhotra, 1996: 196). It was necessary to conduct field interviews for this research because first hand information is needed to obtain the most accurate and most recent market information regarding the vegetable industry. As mentioned earlier, secondary data sources are scarce, therefore, the most accurate and updated information source researchers can have is from their own surveys.

The research interviewers

Three research enumerators fluent in two local dialects (Kankanaey and Ibaloi) plus Tagalog and English were hired to conduct the surveys. This is because of the division of the province into several ethno-linguistic groups. Enumerators who were fluent in these dialects were needed in order to facilitate discussions and obtain the most out of interviews. Furthermore, good communication skills eroded the uneasiness and scepticism of respondents. The interviewers were economics graduates of Benguet State University. They were previously involved in data gathering from economics-related studies conducted by the University and other agencies in the region.

The hired enumerators were briefed on the research beginning with the main objectives and the theories used to support the conceptual framework. Afterwards, each question in the survey form was read so that the intention of the question was clear for all. Their questions regarding how to phrase the questions and how to approach respondents were discussed. The questionnaire was originally written in English with the intention of translating it after pre-tests. However, the enumerators preferred to use the English-language interview schedule and translate the questions into the dialects during the interview proper. This was the same method they used for their previous data-gathering work.

The enumerators worked on a flexible schedule. Beginning in February 2003, they were given a month to cover each of the seven municipalities but had the leeway to

cover another municipality once their personal quota of respondents for the first municipality was reached. The data gathering period was aimed at capturing the peak of vegetable trading during the beginning of the year and when it begins to taper off at the onset of the rainy season in the beginning of June. When data was encoded later, we discovered that none of the farmers surveyed reported harvesting and marketing crops in May. This was an unusual situation because although harvests are tapering off at the arrival of the rains, there are normally still some vegetables harvested in that month.

Several "introductory letters" were written at the behest of the enumerators. This is because of the need to conduct a courtesy meeting with the mayor or the Municipal Agricultural Officer (MAO) of each municipality to get their approval of the data gathering activities in their territories. The enumerators reported that several farmers were reluctant to be interviewed when the research was not "recognized" by the municipal offices. Despite introductions, farmers and traders tended to be shy and suspicious, particularly if they did not understand the nature of the study. Permission to interview was immediately granted to the enumerators when the survey request letters for the approval of the municipality was written and the purpose of the research explained. With their authorization, the enumerators had free rein to conduct the survey. In fact, the MAO introduced the interviewers to some key farmers and traders of their respective municipalities. They were chosen by the MAO because of their extensive farming/trading experience, involvement in the communities and being outspoken regarding municipal concerns. The rest of the respondents were selected by the enumerators themselves by asking the interviewed farmer or trader for other people could refer them to. The interviewers also visited houses randomly, and asked for interviews with farmer or trader. When farmers refuse to be interviewed, the enumerators would ask the farmer to refer them to another farmer that is articulate or interesting and would be willing to share information for the survey.

It is imperative to mention that farmers and traders in the region generally perceive interviews with suspicion. They tend to give general answers when asked about sales, costs and especially income. Their hesitance to supply income-related information is understandable, particularly when many people are sitting and listening to the interview, as is often the situation that the researchers encountered. Respondents tended to be more honest in giving sales information because these are gross returns from which other costs will still be deducted. Production and marketing costs are rough approximations because farmers and traders do not keep farm management or business records. Moreover, farmer respondents identified costs that are incurred on a yearly basis (for example, land lease) together with expenses that are incurred on a seasonal basis (for example, fertilizers and chemicals). Therefore, cost estimates and subsequent income estimates are possibly unreliable. The technique we used to gather cost data is explained in the "Data Management" section.

After the surveys, the questionnaires were organized into farmers and traders and later categorized by municipalities. This made encoding more systematic and data retrieval for specific cases easier. Structured and open-ended questions were encoded with pre-determined variables. Open ended questions were entered into another database.

3.3 The research area and sampling procedure

According to the National Statistics Coordination Board (2001), Benguet's 13 municipalities are grouped into two districts. The more northern District 1 is composed of high lying areas (Bakun, Mankayan, Buguias, Kibungan, Kapangan, Atok, Tublay and La Trinidad) while the more southern District 2 consists of low lying areas (Sablan, Tuba, Itogon, Bokod and Kabayan). Shown in Figure 3.2 is the map of the Philippines, with an insert showing the map of the Cordillera Administrative Region (CAR) and a map of Benguet.

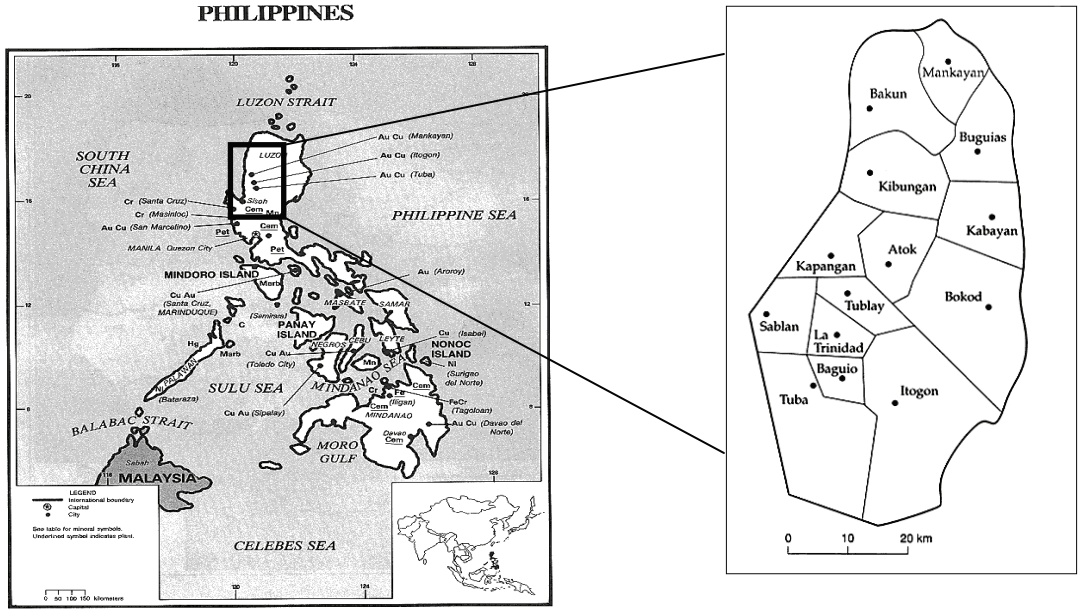

Figure 3.2 Maps of the Philippines and Benguet showing research areas
(Source: NSCB, 2001)

Research area

Benguet was chosen as a research area because it has the characteristics of a Less Favoured Area (LFA) with a high potential to build its unique development pathway. The decision to study the province was also a result of the interest to extend the initial findings of the transaction cost analysis of Benguet vegetable markets in a previous work (Milagrosa, 2001). However, several observations also helped in the resolution to give attention to the province.

First is the fact that vegetable production has historical importance for Benguet. Enterprising American, Japanese and Chinese traders take credit for establishing the province's vegetable industry since early 1900s. Until now, a big part of the population and provincial economy depend on this sector for livelihood and growth.

The province's cool climate and its high altitude are two physical features that give it an absolute advantage in temperate vegetable production over the rest of the country. This unique climatological feature is an asset that the province draws upon to take the

lead among other regions in supplying vegetables for Filipinos. However international competition is beginning to threaten the vegetable industry. This leads to the second reason for selecting Benguet as a research area. It is crucial to find measures that would increase the competitiveness of the sector not only from a production point of view, but also from a marketing perspective.

The third and most compelling reason to conduct this type of research in Benguet is because of the fact that the approach used by this study was never conducted to the industry before. In Benguet, local research is more focused in production-related studies. Market-related research is few, and mostly provides baseline sectoral information. The framework that was developed to analyze the vegetable industry is promising to provide fresh outlook into the sector. The approach allows the research to come up with good advice and relevant insights on how the industry can be improved, as supported by economic theory.

Sampling procedure

Figure 3.3 demonstrate the political-administrative structure of Benguet. Benguet has a total land area of 261648 hectares, which is about 14% of the total land area of the Cordillera Administrative Region. Within each of Benguet's 13 municipalities are several barangays, the smallest local government unit in the country. Each barangay contains a few hundred to a few thousand households. Households are the basic social units.

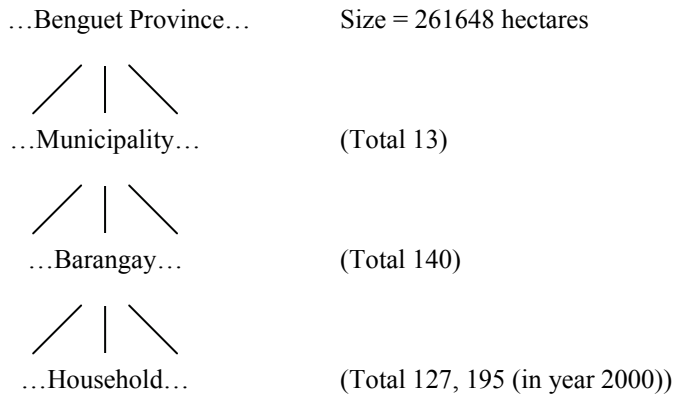

Figure 3.3 Local government structure of Benguet province
(Source: NSCB, 2001)

Seven of the 13 municipalities were selected as survey areas. These municipalities were selected because they are representative of the province in terms of demographics and vegetable production capabilities. They also represent the range of possible geographic possibilities in Benguet. The Provincial Capitol of Benguet, confirmed by the study of Pekas et al (2003) listed the municipalities of Buguias, Atok and Kibungan as the top vegetable producers in the province. This means that these three provinces were able to supply the highest amount of vegetables by volume among all municipalities in the province. The municipalities of Bakun, Itogon and Bokod were classified as least producers meaning, they were able to produce and market the lowest volume of vegetables among all municipalities. La Trinidad was

chosen because it has the La Trinidad Trading Post where most of the vegetables harvested in the region are traded[6].

Within municipalities, barangays were chosen randomly. Within barangays, farmers were chosen using purposive sampling. Farmer and trader sampling was a problematic issue because of the expectation of the availability of complete list of farmers and traders at the provincial level during the research design stage. Thus, the planned random sampling could not be implemented[7]. Generating a complete list for the research would cost time and would force the study to go over schedule and budget. It was decided that the research would follow the "snowballing" procedure used by previous researches in the province (for example, CHARM and VLIR funded researches through Benguet State University[8]). The snowballing method identifies cases of interest from people who know people that are information-rich, that is, good examples for study and good interview subjects (Patton, 1990).

Similar studies conducted by Della Vedeva and Brieva (1995) on seed potatoes in Argentina, Batt on potato farmers in Benguet (2001) Tagarino (2003) on production and marketing of selected biologically produced vegetables in the Benguet employed purposive sampling. In developing countries where reliable lists of potential respondents are absent, such methods of data collection are the only means of contacting respondents. In the absence of reliable mail or telephone system to gather addresses, the purposive "snowballing" method is most appropriate given the circumstances.

In order to be able to use the data statistically with an analysis at 95% significance level, a minimum of 150 respondents is required (Luck and Rubin, 1987; Zhang, 1999: 56). Thus with the lack of population list, the plan that was developed just shortly before the interviews were to be conducted was to set a minimum number of farmer and trader respondents per municipality. The minimum number of farmers and traders targeted for interviews in a single municipality was set at 60 and 30 respondents respectively. Most of the time, the enumerators met and even exceeded the minimum required number of respondents for farmers and traders. For the municipality if Itogon, there were not enough farmers available or willing to be interviewed. The same situation was experienced in Bokod, where there were not enough traders that could be located to participate in the survey. As we mentioned earlier, the two municipalities are among the least producers of vegetables by volume in the province, therefore it was no surprise that they had fewer farmers and traders. Bokod is also a mining town and we suspect that people who do not have land to cultivate are probably employed in the gold mines. The intended and actual samples are shown in Table 3.1.

[6] The total population for the seven municipalities eligible for the survey is 26329 farmers.

[7] There was actually an incomplete list of registered farmers' and traders' cooperative available. However, the author decided not to use them because first, the list themselves were incomplete; second they were showing only registered cooperatives (as opposed to the non-registered ones) and third; a bias towards cooperative members would arise.

[8] CHARM is the $41M Cordillera Highland Agriculture Resource Management Project funded by the Asian Development Bank. VLIR is the Vlaamse Interuniversitaire Raad.

Table 3.1 Survey sample size per municipality, Benguet 2003

Municipality	*Farmers*		*Traders*		*Total of Actual Interviewed*
	Planned	Actual	Planned	Actual	
Atok	60	60	30	30	90
Bakun	60	60	30	30	90
Bokod	60	60	30	15	75
Buguias	60	76	30	30	106
Itogon	60	59	30	30	89
Kibungan	60	74	30	30	104
La Trinidad	60	61	30	30	91
Total	420	450	210	195	645

Source: own survey

The interviewed farmers totalled 450. To increase sample representativity, only farmers who grow vegetables with the intention of selling them in La Trinidad and Baguio City markets for income were selected. Farmers who did not participate in commercial vegetable production for over a year prior to the survey season were rejected. Sampling for traders was also conducted purposely. The interviewed traders totalled 195. To increase sample representativity, only traders who work in their respective municipalities, and those that work in La Trinidad and Baguio City markets were selected. Traders who have not worked in vegetable trade for a year prior to the interview were rejected. Overall there were obviously less traders than farmers per municipality and for this reason, less traders were interviewed.

Using this sampling procedure has its own advantages and disadvantages. The sampling technique is non-random; therefore, generalizations regarding sample results must be handled carefully. However, although selected purposively, the farmers and traders who were interviewed represent a wide diversity of conditions in terms of crops planted, preferred distribution channels, production costs, access to markets and income. The results of the studies are therefore representative of a broad range of circumstances the farmers and traders face within the municipalities of Benguet province[9].

The sampling method employed was successful in targeting local farmers who plant crops for the purpose of income and market them in La Trinidad and Baguio. It was also able to target traders who work for income in the two major vegetable trading posts. Respondents who are willing to speak out and share their experiences were selected. Increasing the likelihood of locating desired characteristics in the population is the major advantage of the sampling method employed. This helps reduce sampling variance and costs (Malhotra, 1996: 369).

3.4 Data management and general methods for analysis

After assigning variables to answers, the data taken from farmers and traders from the field surveys was encoded directly into an SPSS program (Statistical Package for Social Sciences) installed in the computer unit provided by the Agricultural Economics and Rural Policy Group of Wageningen University. It took a few more weeks for corrections and revisions before the data was ready to be subjected to

[9] Listed in Table 7.1 of Chapter 7 are the socio-economic characteristics of farmer-respondents. A discussion follows the table.

statistical analysis. SPSS and Stata were the main tools used to statistically test the data. Microsoft Excel was also used for additional calculations and graph generation.

For the institutional economic and SCP analysis conducted in Chapter 4, frequency counts were used to present the number and distribution of farms, land ownership and tenure, sources of price information and price setting activities. Independent samples t-test was used to compare the equality of means of buying prices that farmers received from the three different trader types.

The farmers and traders were willing to provide information on actual gross vegetable sales for their current harvests but were less forthcoming to divulge production costs. Respondents' difficulty in providing exact cost values is an indication of poor bookkeeping techniques. Their hesitation in estimating production and marketing costs also shows that farmers prefer to avoid the negative social consequences of divulging their financial condition to their community. It is suspected that they were avoiding possible criticisms on how they spent for production, particularly if the capital was borrowed from a financier. Providing accurate values on irrigation, seed, fertilizers and chemicals might also create issues (with financiers and other farmers) on their efficiency in vegetable-growing and in the farming techniques (new or old) that they employ.

The study needed cost information, and since farmers would not give answers when asked about costs, it was decided to rather make use of "cost levels" instead of continuous scales when gathering cost data. This method that gathers information using approximate costs is better than to have no cost information at all. Using cost levels, farmers and traders were asked to indicate within which level their costs fall for pre-specified categories (for example, seeds, land lease, fertilizers and chemicals, irrigation, machinery, etc). The middle point of each cost level for each category were used to approximate costs for respondents. To calculate total costs, the middle point of each cost level for each category was added. Total costs were subtracted from total sales to calculate total incomes. The computation of percentage shares in market sales for both types of respondents gave an idea of the distribution of income among farmer and trader groups. Calculating percentage marketed per type of trader showed evidence of the volume and type of crops marketed by commissioners, wholesalers and contractors.

For the social capital analysis in Chapter 5, Principal Component analysis with varimax rotation was used to look for large correlation coefficients among variables that might suggest that they measure aspects of the same underlying dimension (Field, 2000: 423). Hence, principal components analysis was used to test for factors explaining farmer and trader social capital perceptions, and factors motivating the selection of market outlets.

Still in Chapter 5, hierarchical cluster analysis was employed to check for municipal groupings based on their social capital attributes. Using cluster analyses allowed the research to reduce the number of municipalities into relatively homogenous groups based on the social capital variables considered. Frequency counts, correlation tests were used to test the correlation of social capital against exogenous cultural indicators such as age, gender, education and religion. The non-parametric binomial test and the

ANOVA test of Kruskal-Wallis were used to check for significant relationships between exogenous respondent characteristics and social capital.

Chapter 6 discusses the transaction attributes of each governance structure. The discussion is mostly theoretical, although empirical results through frequency counts of the "transaction cost" part of the survey are added to support the arguments.

In Chapter 7, average linkage clustering and K-means clustering methods were used to group farmers into low and high social capital clusters. One sample t-tests and multinomial logistic regression was conducted. The one sample t-test was used to see if inter-municipal social capital or cluster means were statistically different from each other. In Chapter 7, the multinomial logistic regression procedure of Stata was used to analyze the selection of distribution channels (governance structure) on the basis of the exogenous variables. The regression type used was multinomial logit because the selection approach was posed as a polytomous choice among three governance structures. Several variables (x=age, years of farming experience, farm size, farm-to-market distance etc) were used to predict the probability of y occurring (y=selecting of commissioner, wholesaler or contractor) given known values of x. The explanations on where these tests were applied are discussed in greater detail in the chapters where they were performed.

3.5 Summary and Conclusions

In this chapter we discussed the methodology employed to gather information for the study and how data analysis was carried out. The research was designed to collect relevant information from primary and secondary sources through field interviews and literature review respectively.

A figure showing the three stages of the research process was constructed. In Stage 1, we defined the research problem and developed the conceptual framework using a review of internationally accessible literature. Stage 2 consists of designing the research and identifying strategies to carry out the study. Major activities involved in this stage are: gathering secondary information *on-site* and conducting the survey. In Stage 3, data gathered was encoded and analysed. The main outputs of this stage are the four core chapters of the research.

Primary data sources for the research were personal interviews from 450 farmers and 195 traders coming from seven municipalities of Benguet. The municipalities were selected because they are representative of the conditions in the province in terms of geography, market access, production quality and quantity, and vegetable trade activities. The respondents were selected using the non-random snowballing method because of the difficulties of obtaining a complete list of farmers and traders in the province. However, the method still allowed the research to select cases that are information-rich and are good examples for comparison in the study. The respondents therefore represent a range of ethnic diversity, crop output capacity, production and marketing practices of vegetable growers in the province.

There were two questionnaires developed, one for farmers and another for traders. Most of the structured questions refer to the main theoretical concepts used in the

research: institutional environment, governance structures, social capital, crop production and trading activities. Personal data were also inquired from respondents.

Gathering financial data from respondents proved to be problematic because they tend to avoid questions pertaining to costs and incomes. The study devised a method using the middle point of cost levels to approximate costs. However, total cost and total income calculations showed that many farmers and traders were incurring negative incomes from agriculture. It is possible that 2003 was a 'special year' where many respondents incurred losses. However, results led us to the more plausible conclusion that cost data was not properly captured and therefore did not accurately present real cost and income situation in the province.

Secondary data sources were gathered from international journals, books and internet databases as well as local publications in the Philippines.

The research used mainly SPSS, Stata and MS Excel for the statistical tests conducted. Among the tests we performed are Principal Component analysis, Cluster analysis (hierarchical, average linkage and K-means), t-tests for the equality of means, non parametric binomial and Kruskal-Wallis ANOVA and multinomial logistic regression.

The theoretical approach as well as the statistical tests used by this research has not been previously applied to the vegetable industry of Benguet. For this reason, the analysis this research provides shows promise in offering better and new insights into the vegetable sector. Through the new approach used by this study, relevant market policies on how to improve the vegetable industry, as supported by economic theory, could be recommended.

Chapter 4: Vegetable production and marketing: a mixed *Economics of Institutions* and *Structure-Conduct-Performance* approach

4.1. Introduction

In this chapter, we examine the Benguet vegetable sector using the combined *Economics of Institutions* and *Structure-Conduct-Performance* (SCP) framework that was developed earlier in Chapter 2. This chapter focuses on the structure, conduct and performance of production and marketing; and levels of institutional analysis that correspond with them, in particular; institutional environment, governance structures and resource allocation, respectively. The levels that are analysed here are connected to, and serve as the jump-off point for the more specialised analysis that will be done in the succeeding core chapters of this thesis.

This chapter gives more detailed attention to the following elements of the combined framework: the institutional environment, *structure,* resource allocation, and *performance* of the vegetable production and marketing sector. The purpose is to give the reader not only a general impression of the overall agricultural situation in Benguet, but provide an examination of the several socio-economic and agro-ecologic resource constraints the province faces. The chapter also discusses institutions of governance (Level 3) and *conduct*; and refers to social capital elements in some sections. However, the topic on governance structures merits further analysis and discussion and for this reason, it is taken up again and explored more intensively in Chapters 6 and 7. Likewise, using social capital, the social embedded ness level is examined more deeply in its own chapter (Chapter 5) because of its importance.

In short, this chapter serves more than as a backgrounder on the vegetable sector of Benguet because it is devised to provide information on four levels of social analysis, while providing additional information on the structure, conduct and performance aspect of production and marketing. This approach is different from previous works regarding the vegetable sector of the province because it goes beyond what earlier marketing studies in the region accomplished. Previous local researches recorded harvest volume, measured production and marketing costs or conducted market channel tracing (Dalmo *et al.*, 1994; Rola, 1999). Some researches documented marketing practices in the province (see Dagupen and Ramos, 1997), but failed to justify their evolution and existence. The approach used by this chapter is unique because it provides a deeper insight into temperate vegetable production and marketing in the province - making use of a systematic level-by-level framework - that is supported by economic theory.

4.2 Objectives of the Chapter

The general objective of this chapter is to provide a comprehensive introduction and investigation to vegetable production and marketing in Benguet. The specific objectives are as follows:

1. Investigate the institutional environment and structure of vegetable production and marketing;

2. Examine governance structures and conduct of production and marketing of farmers and traders;
3. Explore resource allocation and performance and present barriers to efficiency confronting vegetable production and marketing in the province

The rest of the Chapter is structured as follows. Section 4.3 presents in more detail the analytical framework used for this chapter. In Section 4.4 a discussion on the norms and values that are important in Benguet, that impact vegetable production and marketing in the region is presented. This serves as the *preface* to the in-depth social capital analysis to be conducted in Chapter 5. Particular attention is focused on Section 4.5 where the institutional environment and S*tructure* of production and marketing are examined. Section 4.6 discusses the governance structures and C*onduct* while Section 4.7 explores resource allocation and P*erformance* analysis in terms of incomes, margins and the strength and weaknesses of the industry. The chapter ends with a summary and conclusions in section 4.8.

4.3 A more specific *Economics of Institutions* and *Structure-Conduct-Performance* (SCP) approach

Presented in Figure 4.1 is a more specific integrated *Economics of Institutions* and *Structure-Conduct-Performance* (SCP) approach that was taken up from Figure 2.1 in Chapter 2. To recapitulate, at the second level of Williamson's paradigm is the institutional environment made up of formal rules and informal constraints. On the S*tructure* side, we describe farm size and distribution, number of farmers, land ownership and tenure, provincial cropping structure, location with respect to the market, infrastructures supporting vegetable production, and marketing.

At the third level of Williamson's schema is the governance structure which deals with how transactions are made in the physical markets. On the C*onduct* side, we discuss cropping and marketing practices, sources of credit and pricing policies.

At the fourth level of Williamson's framework is the resource allocation which examines prices, quantities and incentive alignment in the vegetable sector. On the P*erformance* side, we explore costs, margins as well as barriers to efficient production and marketing in the province.

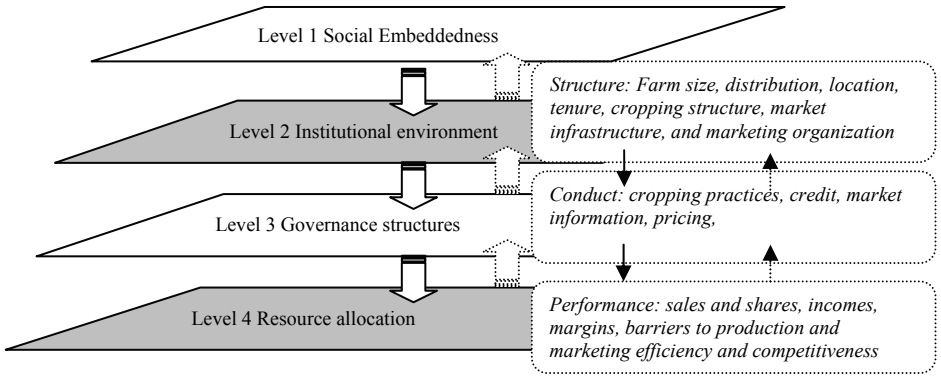

Figure 4.1 Integrated *Economics of Institutions* and *Structure-Conduct-Performance* (SCP) framework

The study of Dalmo et al (1994) mentioned several unwritten marketing norms in La Trinidad and Baguio City markets but failed to discuss the economic and social impact of such activities. The combined framework developed in this chapter attempts to reveal some codes of conduct between farmers and traders which were set by the written and unwritten rules in the vegetable sector. On the one hand, marketing practices at Level 3 influence farmers' profitability at Level 4 while on the other hand the same marketing practices provide evidence of the implications of local traditions and beliefs (at Level 1 and 2) on vegetable sector of the province.

4.4 Social Embeddedness: Norms and values in Benguet that may impact vegetable production and marketing

At the highest level of Williamson's Economics of Institutions paradigm is the level of Social Embeddedness which is to be analysed in-depth in Chapter 5. This section discusses provincial norms and values that may impact vegetable production and marketing of the agricultural communities.

Benguet society reflects the typical Filipino society which, as Benigno (2002:2) argues, centres on familiar trust. This means that more trust is placed on family and friends while those not within the familiar circle are regarded with less trust (and distrust). Moreover, Benigno states that Filipinos, particularly those that belong to distinct cultural groups, are more regionalistic than nationalistic. Filipinos can relate more to their region of origin, than to the Philippines as a whole. In this sense, Filipinos lack a national trust culture, as compared to neighbouring Korea and Japan.

Trust that limits itself to a chosen few would perhaps help explain why farming structures and farm operations are in the province are mostly family-based. Aside from the fact that family labour remains unpaid, the farmer could always rely on his relatives to work willingly on the farm, without financial incentives. Neighbours and friends could also be counted upon for manpower, particularly for operations that are labour-intensive: weeding, harvesting and hauling. However, family members are preferred over non-relatives in working for the farm because they do not expect anything in return for their efforts. Moreover, even if family members were to be paid, the rates are relatively lower than what would have been paid to hired non-family members, and payments are not expected to be given immediately.

The lack of trust towards people that are outside of the core social circle has negative implications on trade, as a certain amount of trust is always involved in any transaction. Furthermore, weak trust towards others hinders information dissemination as well as technology transfers. Part of provincial agricultural production remains traditional not only because of lack of funds but because a *see-and-believe* attitude prevails among farmers.

That Filipinos are regionalistic as Benigno argues is *known*, although it remains to be scientifically substantiated. Regionalism, whose roots can partly be traced in the tribal or ethnic identification of the population, will be tested empirically in this thesis. As mentioned earlier in Chapter 2, an exclusionary type of social capital exists, where people outside the tribe are barred, and networks are sparse and exclusive. Such type of social capital, in a community that depends on exchange can pose negative development effects.

In vegetable marketing, Davis (1973) refers to *economic personalism* that defines the relationship of vegetable farmers and traders in northern Philippines. He observed that Filipinos attempt to include personal elements in vegetable exchange with the intention of improving trade and increasing income. This behaviour is not uncommon in developing countries as it works as a hedge against opportunism in systems where formal rules are weak (see for example Hendriks, 1997). In the next section and in the coming chapters, the issues surrounding social capital and its relation to vegetable production and marketing in the region will be discussed more in depth.

4.5 *Structure* and the Institutional Environment

In this section, we present information about the structure and institutional environment of the vegetable sector of the province. It was mentioned in Chapter 2 that structure and institutional environment have common characteristics and at the same time, have components that differentiate them from each other. The formal rules and informal constraints of the institutional environment are partly responsible for the current structure of the vegetable production and marketing sector. The other way around, the current physical structure of the agricultural system could also partially direct the formation and implementation of societal rules. To some extent, both bring about the restriction of economic activity by defining the set of tangible (structure) and intangible (institutional environment) alternatives that farmers and traders could work with.

4.5.1 Farm Structure

Benguet is one of the six provinces comprising the Cordillera Administrative Region (CAR), a landlocked plateau dominated by mountain ranges[10]. The region where Benguet lies is known as the Cordillera mountain ranges creating land slope ranges from 0-8% (gently sloping) to >50% (very steep). Almost 80% of Benguet land area belongs to slopes of >50% and above (Tagarino, 1996: 104). At approximately 1500 meters above sea level, Benguet's uniquely cool climate is useful for vegetable production. The Population Census of 2002 reported a population of 353752 for the province of Benguet, of which 230000 are in the labour force[11]. Of the total number of people in the labour force, 54% or 124200 were engaged in agricultural related activities (NEDA, 2004).

A special Agriculture Statistical Bulletin released by the National Statistics Office in 2002 however, reported a total of 218,000 household members engaged in agriculture. This includes children below 15 years of age and persons above 65 years old. This value reflects the total population of the province involved one way or another in agriculture, which is higher than the 124000 officially recorded by the province. The special bulletin shows the two faces of agriculture in the province: it provides employment and livelihood opportunities for more than half of the population but also shows evidence of how majority of the population is dependent on agriculture.

[10] Cordillera Administrative Region is composed of Abra, Apayao, Benguet, Ifugao, Kalinga, Mountain Province and Baguio City

[11] The Provincial Capitol of Benguet considers persons between 15 and 65, of sound health and mind to belong to the labour force, the economically active part of the population.

In 2000, the agriculture sector of CAR accounted for 16% of the Gross Regional Domestic Product for that year, dropping to 2% in 2001 when crops failed to due to pests. Nevertheless, current studies show that Benguet vegetable sector was able to recover, currently providing for at least 75% of the carrots, potatoes and cabbage demands of the country (Pekas *et al.*, 2003: 15). By 2004, the agricultural sector of CAR accounted for 13% of the 25.69 Billion Peso Gross Regional Domestic Product of the region, following industry (66%) and services (21%) (NEDA, 2004: 6-8)[12].

The Department of Environment and Natural Resources (DENR, 1995) reported that the province's total land area is 261, 648 hectares of which 77% (or 201469 hectares) are considered forest areas. A total of 23% of the total land area (or 60179 hectares) is considered alienable and disposable. Within the total alienable and disposable land area, 79% (or approximately 47, 750 hectares) is officially classified by the Provincial Capitol as agricultural land.

Presented in Table 4.1 is the farm size and distribution of farms in Benguet. In 2002 the total number of farms was 27,491, up by more than 1.4% since 1980. Notice however that the total area covered by farms in 2002 was almost 30,000 hectares, down by 0.73% compared to the area covered by farms 20 years ago. The evidence shows a dramatic increase in the total number of farms in the province but a decrease in farm area over the same time period. Farms with an area of under one hectare tripled in number from 1980 to 2002 while all other farms in other size categories experienced a *general* decrease in total number during the same time period. The Benguet Provincial Capitol reported that as of 2002, landholdings in the province are characterised by small land areas, approximately 1.48 hectare per farming household. The total number of farms in Benguet province accounted for 23% of the total number of farms in the Cordillera Administrative Region.

Table 4.1 Number and area of farms in Benguet, 1980, 1991, 2002

Farm Size	1980		1991		2002	
(ha)	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)
Under 1.0	5844 (30%)	2590 (6%)	14313 (58%)	5815 (21%)	17575 (64%)	6743 (22.5%)
1.0-2.99	9208 (47%)	14534 (36%)	8308 (34%)	12245 (44%)	7873 (29%)	11441 (38.1%)
3.0-4.99	2577 (13%)	9132 (22%)	1232 (5%)	4364 (16%)	1140 (4%)	4018 (13%)
5.0-9.99	1499 (8%)	9092 (22%)	531 (2%)	3202 (12%)	694 (2%)	4461 (15%)
10.0-24.99	220 (1%)	3257 (8%)	116 (<1%)	1447 (5%)	183 (<1%)	2293 (8%)
25.0 and over	66 (1%)	2311 (6%)	15 (<1%)	697 (2%)	26 (<1%)	1028 (3.4%)
All farms	19414 (100%)	40916 (100%)	24515 (100%)	27770 (100%)	27491 (100%)	29984 (100%)
Average farm size	2.11		1.13		1.48	

Note: The numbers in parentheses represent percentages
Source: National Statistics Coordination Board, CAR and Benguet Provincial Capitol

From Table 4.1 it can be calculated that another important characteristic of farm structure in the region is the distribution of land over farmers. In 2002 more than 90% of total farms were smaller than three hectares but they occupied 60% of the land

[12] GRDP experienced a 3.86% growth in 2002

area. On the other hand 9% of the total number of farms had 40% of the total land area. Area values show evidence of a dual structure existing in the structure of farm size and land distribution in Benguet. A dual structure in an economy indicates the co-existence of two distinct sectors within an economy with disparities in technology and productivity between them (Black, 2002 : 130). Translated to farm size and land distribution in Benguet, a dual structure means the existence of small farms owned by many farmers alongside big farms owned by a few growers within the province.

As Bos (1990 : 169) argues, duality in farm size structure and farm land distribution is a characteristic of many developing countries. In Asia, the last half decade seem to have seen a decrease rather than an increase in average farm size (Gohin *et al.*, 2006: 1). Looking closely, the most dramatic changes in farm structure and farm distribution in Benguet actually occurred between 1980 and 1991. After 1991, farm size structure and distribution of farm land were relatively more stable. In the province, the dramatic increase in total number of farms together with the decrease in area planted was not a result of land reform but of the high population growth, similar to what was observed in rice farms of Japan after World War II (Oshima, 1987: 18-27). In most of Latin America and Southern and Eastern Africa, the dual structure is more pronounced.

Then again, duality can also be observed in more developed countries, but in less severe forms. In the United States, the total number of US farms decreased since 1935, dropping from 6.8 million to 2.3 million between 1935 and 1974. This manifests an increasing productivity in farming and increased non-farm employment opportunities (Hoppe *et al.*, 2001). In Central and Eastern European Countries (CEECs) where very large corporate farms coexist with small family-owned units, dual structure was said to originate from post-war collectivisation and privatisation policies (Gohin *et al.*, 2006: 1).

Land ownership and land tenure are important aspects of the structure of the vegetable sector. According to the National Statistics office, of the total number of household members employed in agriculture, 71% were employed in own holding, 23% were employed in a combination of their own holding and the leasing and the rest were purely leasing. The official statistics of the region mirror survey results of this research. Presented in Table 4.2 is the type of land ownership/tenure of farmer respondents from the survey.

Table 4.2 Land ownership and land tenure among farmers, Benguet 2003

Land Tenure	Municipality							
	Atok	Bakun	Bokod	Buguias	Itogon	Kibungan	La Trinidad	Total
Land owner	47	51	42	57	52	45	22	316
Paying in order to own the land	1	0	0	1	0	2	1	5
Leasing and paying in order to own the land (both in cash or kind)	9	6	16	17	5	21	33	107
Leasing but not obliged to pay	0	0	2	0	1	1	2	6
Part land owner, part tenure	3	3	0	1	1	5	3	16
Total	60	60	60	76	59	74	61	450

Source: own survey

For people not acquainted with Benguet it is noteworthy to point out that Buguias farmer respondents had the highest number of land owners despite the fact that the municipality is only the 5th largest (in terms of total land area) and the 7th largest (in terms of agricultural land) among 13 municipalities comprising the province. Buguias has a long history of vegetable production and is one of the first provinces to begin specializing in vegetable production in the region. Historically, Buguias is the town where "vegetable middlemen" were recognised. As early as the Second World War middlemen worked exclusively on inter-and intra-regional vegetable trade (Lewis, 1992).

It is also important to point from Table 4.2 that more than half of La Trinidad's farmers are growing crops on leased holdings. The municipality is the smallest in terms of total land area (6140 hectares) and 11th in terms of agricultural land area (705 hectares). Located next to Baguio city, it experiences spill over economic effects of being situated next to one of the country's top tourist destinations. It is one of the fastest developing areas of the province and many of the remaining agricultural land are being converted for non-agricultural purposes. As a result, there is a high turnover of land ownership and frequent fragmentation of lands into smaller units. Furthermore, a total of 3% (23 hectares) of the agricultural land in La Trinidad municipality is owned and operated by Benguet State University (Vanci, 2002: 1). In the beginning of the 1990s in an effort to gain more incomes, La Trinidad farmers began to shift to the production of high value crops, including strawberry and cut flower production.

Geographic cropping structure: the Von Thünen phenomenon in Benguet

The decision on which crop to plant on the farm is a crucial one, particularly in the province where markets and market infrastructures are scarce, and where farms are located in remote municipalities. In general, farmers' decision on which crop to plant is influenced by climate, availability of capital, market prices, irrigation and pest and diseases. An equally important factor to consider in the crop decision-making process is the farm's location relative to the trading posts. Research findings of this thesis

point to a peculiar characteristic of cropping structure in the province. Von Thünen's theory of agricultural land use seems to be applicable[13].

In Benguet, land rent is higher in municipalities nearer to the big towns where the trading posts are located and decreases as one goes further out into the remote municipalities. It is assumed that farmers near trading centres would try to maximize rent generation and the limited space by planting crops that are higher in value. Farmers who live near the trading posts would also try to take advantage of lower transport costs by planting crops that are more perishable which would normally be not cultivated in farther municipalities.

Farmers who live in remote municipalities would cultivate crops that are storable and less perishable. They would attempt to reduce transport-related losses by planting crops that can withstand the transport distance between farms and markets. Cropping patterns that follow this theory are said to exhibit the von Thünen characteristic. Figure 4.2 illustrates the geographical distribution of the production municipalities relative to the centric consumption area. From the survey, we observed that some areas specialise in the production of high value-, while some tend to produce low value-crops. These distinctive observations are mentioned in parenthesis in Figure 4.2. The distance of each municipality from the vegetable trading post is also enclosed in parenthesis.

At the national level, the Department of Agriculture recognizes all temperate vegetables as high value. However, in the province, some vegetables that have similar characteristics consistently sell at a higher price than others, prompting the Benguet Provincial government to create a more specific categorization system.

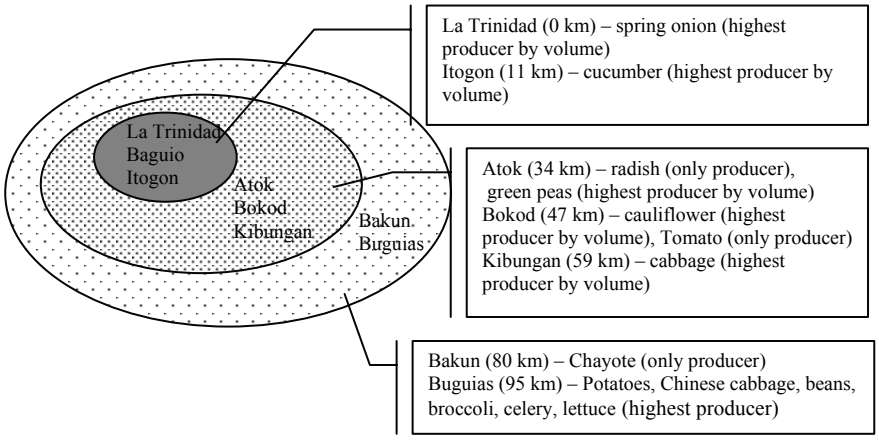

Figure 4.2 Von Thünen cropping structure in Benguet

[13] Von Thünen was a German farmer in the late 1700s who argued that land located nearer the cities have higher land rent than those located in remote areas (Oskam *et al.*, 2006: 172). This leads to circles of specific crops around cities. Differentiated land rent and production patterns are the result of transport costs and time.

To differentiate between high and low value crops, characteristics such as *transport costs* and *perishability* are relevant. In terms of transportation costs, high value crops are more expensive to transport relative to low value crops because they need to be transferred to the markets at the soonest time possible after harvest. They require either cold transport methods or special packing techniques in order to retain their quality. In the province, high value crops are always carefully packed before being transported. In terms of perishability and storability, the quality of high value crops can easily be lost by bruising or crop dehydration. Without cold storage, high value crops deteriorate quickly in warmer temperatures. And, as mentioned earlier, in terms of price, high value crops consistently sell at a higher price than others. Examples of high value crops planted in the region are beans, green peas, green/spring onions, celery, cucumber and bell peppers.

Low value crops are cheaper to transport relative to high value crops because the produce retains its quality for a longer period of time without the immediate need for cold transport methods or special packing techniques. In Benguet, the *buhos* method for transporting low value crops is still practiced. In this system, all harvested crops are simply deposited in the truck without any grading or packaging beforehand. The vegetables will be sorted, cleaned and packaged only upon arrival in the marketplace. The quality of low value crops do not deteriorate as quickly as high value crops, even without refrigeration. Thus, they are storable for a longer period of time compared to high value crops. Low value crops consistently sell at a lower price than compared to high value crops. Traditional crops such as potatoes, carrots cabbage, chayote, Chinese cabbage belong to the low value crops. Crops that do not strictly belong to either low or high value category are termed mid-value crops. These include lettuce, cauliflowers and broccoli.

Take Figure 4.2 for example. In the illustration, the major trading post in the province is located in La Trinidad, the capital of Benguet. Using *transportation costs* and *perishability* criteria, data showed that La Trinidad municipality is the highest producer by volume of spring onions, a fragile crop that sells at a higher price per kilo in the market, relative to other crops. Spring onions are highly perishable because they easily lose water content and bruise easily. They need to be in the market in the shortest time possible, in order to capture highest buying prices in terms of freshness.

Going away from the centre, the mixed cultivation of mid- and high-value crops is observed. At 47 kilometres away, the municipality of Bokod is the only producer of tomato at the time of the survey, and the highest producer of cauliflower by volume. Tomatoes need special packing when transported, in order to avoid quality loss by injury. Tomatoes have a longer shelf life than spring onions, but not as storable as potatoes. Cauliflowers need special packing techniques to protect the heads from injury, although, similar to tomatoes, they do not deteriorate as rapidly. Their hardy quality allows them to be transported at lower costs and with less value loss.

In the peripheries, we observe the cultivation of mostly low value crops that are less perishable and easier to transport. Bakun is the only producer of chayote, a hardy vine-growing crop that grows year-round and sells for cheap in markets. Chayote is transported packed in 50-kg sacks or bamboo baskets or through the *buhos* method. The town of Buguias is the highest producer by volume of several crops of high, mid and low value. Potatoes, broccoli and lettuce are among the crops produced in this

town. Chayote and potatoes are storable for longer periods of time because they do not lose their quality immediately after harvest. Moreover, it is cheaper to transfer them because of the lack of need of special packaging techniques in transport. During transport, chayote and potatoes do not suffer from quality losses as much as high and mid-value crops.

The mixture of low and high value crops that are planted in Buguias can be attributed to two factors. First, Buguias has a long history of vegetable production and therefore, the technologies to produce all types of crops are available here. The second reason is because the physical limitations of the land prohibit farmers to plant the same type of crop year-round. There is a need to diversify their cropping strategies after a few seasons.

From observing Von Thünen's theory to the crop producing structure in Benguet, we come to three observations. The first observation is that differences between the Von Thünen theory and actual cropping patterns exist because of tradition and risk aversion of Benguet farmers. Because of tradition, the production of traditional crops such as cabbage, potatoes and carrots are constant in all municipalities. Because Benguet farmers are risk averse (Tagarino, 1996: 229), farmers try to be consistent in their choice of crops; in the sense that they try to plant the same crop every season. The second and third observations are an application of the Von Thünen theory. It is observed that the larger the distance of the farm to the trading posts, the more likely that farmers plant low value crops. Finally, it was also observed that the nearer the distance of the farm to the trading posts, the more likely that farmers produce high value crops because of the higher land rent.

The centre-periphery observation in the context of crop choice provides an explanation of the position of contractors in the province. Because contractors pay for harvest and post harvest activities, transportation, as well as carry over the risk from farmers, it follows that they prefer to contract high value crops and be located near to the city to reduce transportation costs and get the most income. Since high value crops are planted near the centres, it also explains why contractors are more visible near the trading posts. The other way around, contractors try to focus on the centres in order to reduce marketing costs. But, since there are fewer farmers in the centres due to less land available for agriculture, there are fewer harvestable high value crops. Since there are fewer high value crops, there are fewer contractors in general.

The farm size and distribution of land over farmers of Benguet shows a tendency towards a dual structure where there are many small farms distributed to many farmers and a few big farms distributed to a few farmers. Cropping structure appear to follow Von Thünen's theory of land rent where higher value and more perishable crops are planted nearer to the town centers while lower value, more storable and less perishable crops are planted in remote municipalities.

4.5.2 Market infrastructure

In the province, around 80% of farm input supply stores are located in La Trinidad and Baguio City. The remaining agricultural supply outlets are distributed in Atok (3), Buguias (3), Kapangan (2), Kabayan (1) and Tuba (1) (Dalmo *et al.*, 1994: 31). Vegetable producers from other municipalities need to travel outside of their

communities in order to purchase farm inputs. Loading platforms are specially constructed concrete sheds that are located on roadsides. They facilitate manual hauling of vegetable sacks into trucks. There are a total of 21 loading platforms in Benguet, six of which are in the municipality of Buguias. There are two vegetable trading posts serving Benguet; the bigger of the two is the La Trinidad Vegetable trading post (LTVTP) that handles the bulk of wholesale activities. La Trinidad vegetable trading post is approximately 9125 square metres in size. The trading post has separate areas for wholesale and retail activities. There are 19 warehouses for vegetable cleaning, grading and storage which are all located in La Trinidad area. All warehouses are privately owned by big Manila-based wholesalers. Baguio City Hangar market, where mostly secondary trading and retail activities occur, is six kilometres away. Baguio City Hangar market is approximately 2116 square meters in size.

Good farm-to-market roads are necessary for quick vegetable transport with minimal spoilage. There are a total of 1461 kilometres of Benguet road networks ranging from concreted or asphalted national roads to unpaved village-level roads. Mountainside roads leading to vegetable-producing municipalities are easily damaged because their construction is not suited for constant use by heavy vegetable-laden trucks. During the rainy season, erosion, landslides and road blockage is one of the province's biggest concerns. Farm to market roads are a different story. In Benguet, farm-to-market roads are in the form of footpaths, footbridges and flattened soil and gravel systems. Only main roads are concretized. According to the Benguet Agrarian Reform Office in 2005, there are municipalities that remain inaccessible through farm-to-market roads or many towns lack supporting market infrastructures. To reach Benguet from the crop-producing municipalities of the north, trucks take the Halsema highway, Mountain trail or Cervantes-Abatan Road. Benguet is located 250 kilometres north of Metro Manila, its main external market. It takes around 6-10 hours for vegetables to reach Metro Manila using overland transport. There are three highways connecting the province to major markets in the south; Marcos Highway, Naguilian Road and Kennon Road.

4.5.3 Institutional Environment

The institutional environment represents political, social and legal rules of conduct that defines the basis for production, exchange and distribution (Davis and North, 1971: 6-7). There are two ways to study institutions: by analysing the impact of certain types of existing institutions on the way human agents behave (and the way the economy performs) or by exploring how certain types of institutions emerge from the behaviour of individual agents (Sweegers, 1998: 2). In this research institutions are analysed using the first approach. The focus is on the institution of middlemen in Benguet because of their pivotal role in vegetable marketing in the region. In the same vein, because of the importance of cultural context in production and marketing in Benguet, we emphasise on the institutionalization of the *suki* or favoured buyer system, a personalised relation of exchange which is a unique feature the vegetable sector of the province.

4.5.3.1 The evolution of traders

The province of Benguet started vegetable production during the American period of 1900 to 1941. Under the American government slavery was abolished, freedom of religion and the liberty to observe cultural traditions was granted to the indigenous population of the province. Most importantly, private land ownership was introduced, agricultural tools and vegetable seeds were brought in, and money became an important economic feature of the lives of the people (Municipal Profile, La Trinidad Municipal Office).

Vegetable marketing used to be conducted solely through wholesaler-retailers who purchase the vegetables from farmers and sell them within the province and in the nearby markets. At that time, local wholesalers bought vegetables along the Mountain Trail and transported it to Baguio using trucks in an 8-hour drive to sell to Chinese agents (Lewis, 1992: 155-156). Over the years, as the number of farmers and volume harvested grew, more wholesalers entered the market. Hilary Camias, the leading vegetable wholesaler after the Second World War hired several "agents" whose job was to haggle with farmers in remote municipalities. This paved the way for the creation of a new breed of traders, the commissioners, apart from the traditional wholesaler. Commissioners at that time were the most efficient and most effective modes of market governance. The presence of commissioners increased trading manpower of wholesalers and broadened the supply source into remote vegetable-producing municipalities. More farmers were accessed, leading to an increase in volume of vegetables traded. The lack of modes of vegetable transportation, the lack of proper roads and lack of local market outlets made commissioners the more sought-after marketing arrangements. On their side, mediating between wholesalers and growers brings income for less effort. After a while, due to the proliferation of commissioners in farming communities and vegetable trading centres, governance structure in the form of commissioners became most common.

Lewis (1992: 158) describes the early origins of contracting, locally known as *pakyaw* (or *pacyao*). At the height of commissioners' market presence, wholesalers felt threatened and decided to venture further through the advance purchase of un-harvested crops. Growers eagerly took in this new trading method, to have a sure source of income and to recoup production costs as early as possible. However, contractual arrangements soon developed uncertainties. According to Lewis, some farmers who received early payments sold their crops to other commissioners or wholesalers. Other times, wholesalers-turned-contractors remitted less money (than the previously agreed upon amount) to the farmer using crop spoilage or decreased prices as an excuse.

4.5.3.2 The institutionalization of the suki

Personalised economic relations have long been a feature of markets in less developed countries, including the Philippines. When compared to the impersonal firm-to-firm transactions of developed countries, the existence of long-term business relations when a short-term deal is more efficient and profitable seems irrational (Hendriks, 1997: 14). Recently however, economists reason that in certain contexts these

personal market relations reduce risks and uncertainty and lowers costs in market transactions (Davis, 1973; Acheson, 1985; Plattner, 1989).

In Benguet, personalised methods of economic exchange are referred to as the *suki*. The *suki* is a system of benefaction in which a customer regularly buys from the same seller and receives special favours from them in return (World-Bank, 1980). Taken in a commercial context, the *suki* is a supplier and buyer relationship that developed from regular exchange with each other. The depth of the suki relationship differs with each relation but over time, repetitive transactions with the same person develops trust. A *suki* relation that involves trust in the relationship becomes "embedded in networks of social relations" of the people involved (cf. Hendriks, 1997: 15).

Factors such as the type of commodity marketed, physical and social structure of the market, marketing conduct and social capital of the people all have roles to play in the institutionalization of the suki system. In Benguet the perishable nature of crops and market imperfections such as lack of market information, poor farm-to-market roads and lack of market infrastructures make creating relations with trading partners important for security in the transaction process.

Even in the early years of vegetable production and marketing in the province opportunistic behaviour was present. In the case of potatoes, for example, the lack of a standardized grading system or mechanized potato grading machines creates opportunities for cheating on both sides (Bulso, 1998: 26). Some farmers can cheat using the *sabog* (spread) practice where smaller, injured or wet potatoes are placed in the middle of sacks while the bigger, healthy and dry tubers are placed on the visible parts of the sack. Since vegetable grading is done by hand sizing or visual estimation, traders can cheat using grading methods where the sizes and quality are intentionally lowered in order to reduce buying prices. In short, both farmers and traders are vulnerable to opportunistic behaviour. The *suki* system proliferated in efforts to find ways to alleviate such risks.

The *suki* is a dynamic dyadic trading relationship. A farmer or trader may have many *sukis* simultaneously but the formation of the suki itself occurs only between two people. Suki forms for reasons of credit, family-friend-relations, long-term acquaintance or trading operations. Other important motives for entering *suki* relations include a secure outlet and access to capital for farmers; and a steady supply of vegetables for the trader. On both sides, there is reduced search, negotiation, and monitoring costs because the suki lives up to the norms and values of reciprocity (cf. Hendriks, 1997: 16).

A farmer may sell only first class vegetables to one *suki*, then second class vegetables to the other *suki*. Likewise, a commissioner may have several *suki* farmers in order to collect the vegetable quota his buyer requires. Wholesalers and contractors become suki, particularly when credit or a shared social capital cements his relationship with the farmer.

A *suki* refers to the relationship but could also refer to the person with whom the trading relationship is based. As will be explained more in Chapter 6, the importance of the identities of trading partners differs among the three governance structures that represent three different kinds of farmer-trader relationships in the market. Suki

becomes more important and relevant as one moves from a market based (commissioner-led) to a more relationship based (contractor-led) mode of organization. In the suki relationship, stakeholders learn about each other's situation in the process of regular exchange. Afterwards, a moral obligation enters the relationship resulting in reduced prices, and credit availability. When credit enters the farmer-trader relationship, farmers who availed of production loans from traders are usually compelled to directly sell their harvests to the lender-trader. Because of credit commitments, the two become each other's *suki* until the loan is paid off (cf. Hendriks, 1997: 147-148). In developed countries, this refers to *locked-in* situations.

Sometimes, forging *suki* relations could be "forced" by informal market rules. In La Trinidad vegetable markets, it is customary for farmers to provide traders with an additional 10 kilograms of vegetables per 50-kg basket of vegetables sold. The additional vegetables are free and serve as an act of goodwill of farmers towards traders (Dalmo *et al.*, 1994).

The social structure of Benguet agriculture sector facilitates the formation of preferred buying arrangements. In our survey, 254 farmers who were receiving delayed payments from traders were asked how they were assured that the trader will not renege on his promise to pay. A total of 72% replied that they are acquainted with the trader while the rest stated that they know the trading partner's contact details. These pertain strongly to the interlinked social networks within production and marketing spheres in the province. The premise of social networks also works in the reverse direction. When trust is low in the marketplace to begin with, it is better to create trading relations in order to obtain honesty in market information exchange and the transaction itself.

Wholesale vegetable marketing in Benguet mostly follows traditional market channels (Digal and Concepcion, 2004:8). It is also because of the competition between several channels that the suki evolved. According to Dalmo et al (1994), the suki relationship is sometimes so strong it can transcend formal marketing rules. In Baguio City markets, last priority is given to farmers who arrive in the markets without prior marketing arrangements or those without preferred buyers. In other words, the first priority is given to farmers who had previous marketing arrangements or those who have favoured ties (*suki*) with traders in the market. The limited area for wholesale activities in Baguio City markets means less vegetables by volume are traded here compared to La Trinidad. Moreover, because the market caters to higher-income consumers and tourists, this also implies that vegetable buying prices in Baguio are generally higher than La Trinidad prices. This leads to stronger competition among farmers who want sell their vegetables here and the need to create relations with traders.

Because of the lack of enforcement mechanisms in vegetable markets, creating *suki* relations is important to secure payment from traders, particularly when there is no formal rule regulating payment issues. The research of Dalmo et al (1994) showed that in both major trading posts, all farmer-trader payment agreements are carried on an instalment basis, without assurance of full payment dates or if amount will be paid in full. This increases the income risk for farmers and necessitates the formation of relationship with a trader in order to reduce the chances of being cheated.

The formal rules with regards to vegetable marketing in La Trinidad and Baguio city do not officially acknowledge the existence of the suki system although there are also no regulations that sanction it. In fact, with regards to the formal institutional environment, a survey of current market regulations show that rules are mostly concerned with the establishment of proper codes of conduct within trading posts and accurate/timely payment of market fees.

4.5.3.3 The formal rules

In gathering official regulations with regards to vegetable production and marketing in the region, the researchers encountered difficulties. With regards to documents pertaining to land ownership and property rights in the region, these are not always available for public viewing because of on-going court cases and political controversies surrounding them. Indigenous people of the Cordillera invoke customary laws, conflicting national land laws and human rights laws to assert their claim to ancestral lands, against land that is claimed for public consumption. Highland areas that are occupied by indigenous groups which are not covered by official documentation are still under contest[14]. Therefore, related documents pertaining to land are not legally available.

Documents with regards to vegetable marketing in the region were relatively easier to locate primarily because they were available for public viewing and because the documents were fewer. A perusal of the Appendix to Chapter 4 which contains a list of formal rules and regulations concerning vegetable marketing in La Trinidad and Baguio City markets show that the rules attempt to maintain order through proper decorum in the trading areas. The La Trinidad rules are more concerned correcting moral behaviour within the trading post premises, most of which are not related to the act of vegetable exchange itself.

Ordinance No. 19-95, Chapter IV Article 1, Section 12-13 enumerates activities which are forbidden in the trading areas, among them: making rented stalls as residences (#1), drinking (#2), gambling (#9) and loitering (#6). During market observation activities conducted by the research, some of the enumerated prohibited activities in Ordinance 19-95 are were not followed. Several people were observed selling non-vegetable items (#3), cleaning trucks and vehicles (#5), blocking centre alleys of the trading area (#4 and #11), and were doing retail activities (#13). It was also observed that some of the rules were difficult to put into practice, in particular (#16) prohibition of entrance of people with communicable diseases (how to detect) and (#17) the illegal selling of vegetables with high toxicity levels (no instrument to measure toxicity). Ordinance No 42 and 43, Chapter IV Article 1, Section 12-13 refer to the issuance and wearing of identification cards for all persons doing vegetable exchange in order to avoid fraudulent behaviour within the trading centres. It was observed that conflict-resolving mechanisms such as rules of arbitration or renegotiation in cases of transaction failure are lacking. There are no specific rules that sanction opportunistic behaviour among farmers and traders.

[14] June Bill-Prett (1994) discusses in detail the issues surrounding "Indigenous Land Rights and Legal Pluralism among Philippine Highlanders" in the Law and Society Review Vol. 28, No. 3, Law and Society in Southeast Asia (1994), pp. 687-698

The lack of important rules with regards to a standardized vegetable grading system and transaction safeguards have already been reported by Dalmo et al (1994). They argued that the rules that are available in the two markets do not address important transaction-related issues.

The formal rules in Baguio city market are more concerned about the income to be generated from stall rent-outs and therefore, majority of their laws are related to this issue. Baguio City Hall Ordinance No. 2000-01 Chapter XVIII, Section 146 and Chapter XIX, Section 147a and 148 refer to rentals, their due dates and the consequence of non-payment. Section 150 pertains to the container diameters and their corresponding market fees.

The general view with regards to the formal institutional environment of Benguet vegetable sector is its inadequacy in several aspects. The drawn out court procedures with regards to property rights creates an unstable platform for the creation and implementation of newer, more propitious land laws that address and reflect the current social situation. Conflict-resolving mechanisms such as rules that sanction opportunistic behaviour from both sides of exchange are lacking. The rules that are available fail to address important basic issues affecting farmers and traders in vegetable trade.

4.6 *Conduct* and Governance Structures

The *conduct* part of the SCP approach refers to the behaviour of farmers and traders in the agriculture sector of Benguet as influenced by the *structure* of the production and marketing system. The study of *conduct* covers production and marketing operations, which includes the modes of organization used to exchange crops.

4.6.1 Production and Marketing *Conduct*

Steep slopes that characterise Benguet terrain limit the land area available for agricultural use. Hence, despite the erosive soil, intensive cropping typifies vegetable production in the region. Except for the rare crop deviations, the same vegetables have been planted on the same soil for decades, allowing less time for the soil to regenerate. Intensive cultivation of the soil eventually led to depleted soil fertility. Coupled with plant pathological problems, farmers in the province spend huge amounts for fertilizers and chemicals. These bring expenses higher and oftentimes cause losses when vegetable prices are too low to recover production costs.

Declining land fertility is one of the biggest concerns of farmers and the municipal governments. Erosion caused by the structure of the terrain is further induced by the heavy rains on sloping farms and over-cultivation. Soil minerals get depleted quickly and the top layer does not have time to regenerate before the next cropping season begins anew. Preventive and rehabilitative measures have been taken by concerned local agencies, sometimes in cooperation with foreign donors. The “Soils and Water Conservation Project” of the Department of Agriculture continues to introduce “soil conservation methods of land utilization” to Benguet farming communities through promotion of organic fertilizer use and trainings. The Sloping Agricultural Land Technology (SALT) and Appropriate Farming System (AFS) are recommended by the department because of their applicability for mountainous terrain.

Traditional farming techniques and slow technology transfers could be behind non-optimum production in the province (see for example Rola, 1999; Aquino, 2003). Many growers observe only two, instead of three cropping seasons per year because their farms are primarily rain-fed. To reduce costs the use of 2nd and 3rd generation seeds, which are proven less prolific (Tagarino, 2001), is also widespread. The demand for more extension activities, like the Department of Agriculture's on-farm demonstration trials and technology dissemination programs is big.

The fragmentation of arable land areas into smaller parcels indirectly signifies farmers' financial difficulties to operate vegetable production on a larger scale. The availability of production capital is critical in vegetable production particularly in areas with low income growers. In the ideal situation, banks and credit institutions provide financial support for production purposes. In the Philippines as in Benguet, the formal agricultural credit market is undeveloped because small farmers do not have collateral or the necessary legal documents for their assets. In addition, voluminous documentation requirements and bureaucratic delay characterise the formal lending process (Gimenez and Bagyan, 2004). For this reason, informal credit sourcing is widespread among farmers. Cooperatives and traders are the most common sources of money because of the quick release of funds, few if no supporting papers or collateral required, and the flexible terms of payment. Unfortunately, most cooperatives do not accumulate enough money to accommodate farmer-borrowers (Gimenez and Bagyan, 2004: 3). A total of 46% of the farmers interviewed received financial support from traders. Informal credit sources, however, post high interest rates or create disadvantageous farmer repayment procedures. When farmers are unable to repay because of the high interest, they are compelled to sell their harvests to the traders (*suki*), creating a *locked-in* effect until the debt is paid off.

The presence of only two big markets for vegetable wholesale in the province could exacerbate farmers' lack of market information. In an earlier study by Lizarondo et al (1982: 29) 26% of Benguet and Bauko (Mountain Province municipality) farmers were oblivious to vegetable prices. This increased to 68% in 2003 (our own survey). Rola (1999: 7) later showed that around 73% of farmers use co-farmers as their source of market information, almost the same as the findings of this study where 72% of the farmers cited other farmers as their primary source of price data.

Vegetable prices in the province are by nature volatile. This means critical price and payment negotiations between farmers and traders occur before a transaction is conducted. Longer negotiation processes are observed when price uncertainty is high among transacting parties (Chatterjee and Samuelson, 1983). Only 32% of farmers surveyed in this research acknowledged that they know current market prices in the province while the rest are mostly uninformed. Farmers' sources of price information are listed in Table 4.3.

Table 4.3 Farmers' sources of vegetable price information, Benguet 2003

Sources of vegetable price information	Frequency	Valid Percent (%)	Cumulative Percent (%)
Other farmers only	155	35	35
Traders only	19	4	39
Radio only	54	12	51
Bulletin board (in trading posts) only	3	1	52
Other people in trading posts only	14	3	55
Via mobile phone short messaging system	7	2	57
Other farmers and radio, combined	140	31	88
Other farmers, traders and radio, combined	31	7	95
None	19	4	99
Anybody who comes from the trading posts	12	1	100
Total	444	100	

Source: own survey

Only 4% of farmer respondents source their price information purely from traders while 7% use a combination of other farmers, traders and radio announcements as information sources. This is because almost 60% of the farmers interviewed believe that traders tend to withhold critical price information. Knowledge of market prices is important for farmers to set a minimum reservation price or for traders to set a maximum offer price. According to Jaleta and Gardebroek (2005: 11) a farmer suffers significant bargaining power loss when the trader speaks his price offer first.

Vegetable prices in the province are known to fluctuate and for this reason, the local government set up offices whose job is to monitor and disperse price information. Aside from the local governments and other socio-economic research stations, there are three main offices that observe vegetable prices in the province. The Bureau of Agricultural Statistics (BAS), National Food Authority (NFA) and National Statistics office (NSO) all gather wholesale and retail price information from the two major vegetable markets. The NFA uses price information for internal purposes while the BAS and NSO publicize analyzed data through bulletin boards, print, broadcast media or agency publications (Dalmo *et al.*, 1994: 94-95). It appears that price monitoring alone is not enough and information dissemination methods are inadequate or slow. In most market studies including this one, farmers expressed a chronic lack of market information leading to less bargaining power (Lizarondo *et al.*, 1982; Dalmo *et al.*, 1994; Tagarino, 1996; Rola, 1999; Milagrosa, 2001; Pekas *et al.*, 2003).

Prices and harvest quality and quantities are the most common sources of disagreements of farmers and traders in the province. Perhaps one reason why disagreements occur is because of lack of proper documentation of the transaction process: only 69% of all survey respondents write down and sign details of the transaction. When disagreements occur, renegotiation between farmer and trader without the interference of a third party happens to 87% of the farmers surveyed. Arbitrated settlements and court trials are rare.

4.6.2 Governance Structures

The C*onduct* part of the SCP framework covers a wide area, including the study of governance structures which is at the Level 3 of Williamson's framework. Analysis at this third level is about the effectiveness and efficiency of governance structures to

create order, mitigate conflict and realise gains (Slangen, 2005: 18; Williamson, 2000: 599). In this section, we introduce the modes of organization that farmers use to sell their crops. The analysis of the efficiency of governance structures is taken up more intensively in Chapter 6.

In Benguet, there are three governance structures by which farmers distribute their harvests for marketing purposes. The first arrangement is through market-based governance using commissioner coordination. The second arrangement is a hybrid coordination which has characteristics of a market and credit coordination between farmers and wholesalers. The last arrangement also a hybrid governance which has faint characteristics of the market but more of relational contracting between farmers and contractors. An illustration of the different alternatives is shown in Figure 4.4 below. Note that the research focused only on the relationship between farmers and their selected transacting partners in the preliminary marketing stage (denoted by the full-lined boxes) and not on the third-level buyers (grey-lined boxes). The ***"=end"*** represents the final buyer for the farmers' crops.

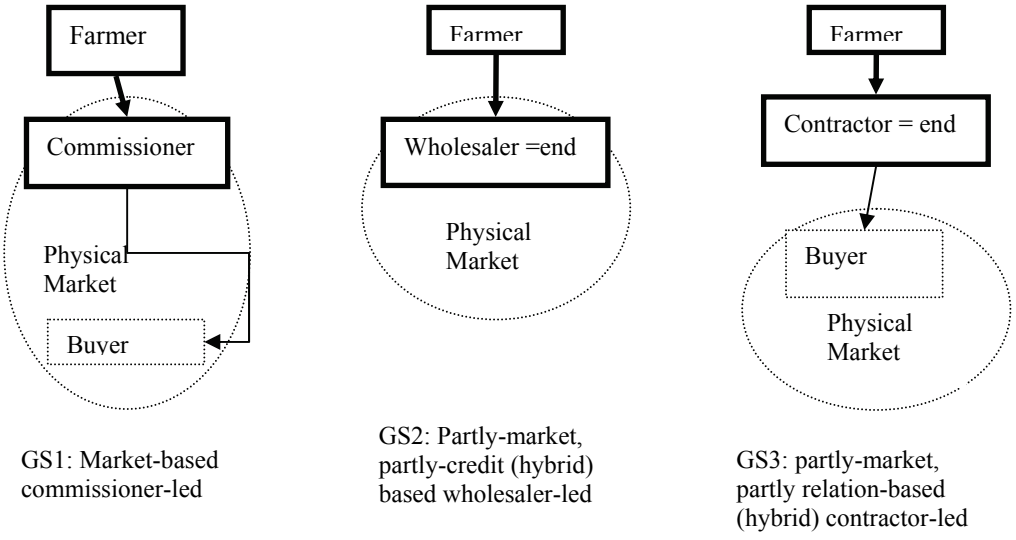

Figure 4.4 Governance structure (GS) alternatives in Benguet vegetable market

In the commissioner-led governance structure (GS1), a commissioner agent is a mediator who helps the farmer locate a buyer, in exchange for a commission fee, hence the name. In his search process for farmers' buyers, the commissioners provide farmers with market information when they report buying-offers back to the farmer. The commissioners' buyers could be local or Manila-based wholesalers or institutional buyers[15]. Wholesaler-based transactions (GS2) are technically similar to GS1, except that farmers and wholesalers transact directly with each other because the commissioner is omitted from the transaction. Aside from being the farmer's final buyer, wholesalers commonly loan farmers with production inputs and offer credit support.

[15] Further down the chain, wholesalers sell to institutional buyers, retailers, or to wholesaler-truckers who transport vegetables to other cities.

Selling through contractors (GS3) means that the farmer creates a binding verbal contract with the contractor, where the harvest or most of the harvest is committed to the contractor for a certain selling price of the growing crop. Contractors estimate buying price based on existing farm and market price levels, projected harvest volume based on field size and projected vegetable grades. Selling through commissioners (GS1) or wholesalers (GS2) means the farmer brings the crops to the trading posts and searches for a buyer for his crops. Selling through contractors (GS3) means the contractors take over the harvesting and all post-harvest activities, while the crops are still at the farm level. This implies two things: farmers should be able to trust the contractors' estimates when they offer to buy his crops and second, that the harvest/post-harvest risk is distributed to the contractor from harvest time onwards.

4.7 *Performance* and Resource Allocation

The following section discusses resource allocation in Benguet markets by looking at vegetable prices and quantities. In items pertaining to qualities, sales and incomes, farmers (and traders) were referring to their latest harvest in the most previous cropping season, as a reference for answering questions. Performance of the vegetable sector was evaluated by looking at sales, incomes and market shares. The section ends with an examination of the barriers the province faces in production and marketing efficiency.

4.7.1 Quantities produced

Table 4.4 presents the actual volume of crops produced by farmers, classified by month. The items in bold were actual volume marketed during the survey period, the rest accounted for production in the other months of the year. In order to be consistent with sales and income data, only production and marketing date from the observation period were taken into account for the subsequent analysis done in the thesis. In the survey conducted from February to May 2003, farmers were asked questions about their previous production season. Later it turned out that some farmers' refer to previous production season that are several months back. This is because, although many farmers are cropping less often due to lack of irrigation, their main reason for irregular cropping seasons is the lack of finances and means of production.

Table 4.4 shows that cabbage is the most widely cropped vegetable in the province, followed by potatoes, carrots and Chinese cabbage. These crops are considered traditional crops that are planted by most of the farmers in the province. Moreover, Table 4.4 also shows that the peak harvest and marketing season in the months leading towards the end of the year.

Table 4.4 Vegetable production (in kilograms) by type of vegetable marketed, Benguet

Month	potatoes	cabbage	beans	radish	chayote	Cauliflower	carrots	Chinese cabbage	green peas	green onion	broccoli	bell pepper	tomatoes	celery	lettuce	cucumber
Jan	48200	40500	13900	0	99	3000	6000	12850	700	750	2800	250	4000	3250	5600	1500
Feb	**13025**	**69000**	**8700**	**0**	**0**	**0**	**31800**	**15940**	**850**	**700**	**0**	**400**	**4000**	**400**	**3900**	**0**
Mar	**42600**	**24100**	**5500**	**0**	**2000**	**0**	**13500**	**6650**	**40**	**0**	**6000**	**1500**	**0**	**2500**	**5500**	**1000**
April	**0**	**2000**	**220**	**0**	**0**	**0**	**0**	**1500**	**0**	**0**	**0**	**0**	**0**	**3500**	**0**	**0**
May	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
June	0	21000	1200	0	0	0	0	1000	0	0	0	0	0	0	0	0
July	6200	3500	699	0	0	0	0	150	0	0	0	0	0	0	0	1500
Aug	24000	8005	700	0	0	0	16000	0	120	0	1500	894	0	0	0	0
Sept	80200	137200	0	3000	0	1200	27800	0	2377	0	9170	0	1000	2000	3000	1000
Oct	42800	32800	5400	15000	0	0	21000	13000	1390	1980	10600	0	0	0	13800	1800
Nov	77150	192500	5160	0	0	1100	18735	11300	1411	5260	3100	0	2000	2920	8650	200
Dec	52900	139000	2850	1800	0	1450	19950	45100	860	2100	5300	0	2000	0	15419	0
TOTAL	387075	669605	44329	19800	2099	6750	154785	107490	7748	10790	38470	3044	13000	14570	55869	7000

Source: Survey conducted in February to May 2003

Focusing only on data gathered during the observation period, February was the peak harvest and marketing season, where almost 150 tons of different kinds of vegetables were produced. By May of 2003, respondents reported no marketing activities, probably because vegetables of the previous season were harvested already and growers are beginning a new cropping cycle.

4.7.2 Performance

Prices play an important role in markets. In neo-classical economic theory, prices, together with other economic factors, coordinate the actions of buyers and sellers in the market by influencing production and consumption decisions (Tomek and Robinson, 1990: 3). Costs, sales and incomes are measures of market performance used in the SCP approach. The objective of the succeeding sections is to assess the performance of farmers and traders in the physical markets in the context.

4.7.2.1 Farmer sales, costs, and incomes

Shown in Table 4.5 are the total sales of farmers, grouped into five sales categories of increasing order. The values were obtained from the survey and were derived without holding for type of marketing arrangement used. In terms of total sales, we observed a clear distinction among farmers: almost 70% of the farmers had only 30% of the total sales reported by all the respondents. On the other end, note that 13% of the farmers obtained 42% of total market sales. The duality of sales distribution among farmers supports the initial observation of the duality of the farm structure in the region.

Table 4.5 Vegetable sales in pesos, by category, in one season, Benguet farmers, Feb-May 2003

Total sales (pesos)	Absolute count of farmers	Cumulative count of farmers	Relative count of farmers (%)	Cumulative-relative count of farmers (%)	Mean sales (pesos)	Mean sales by number of farmers (pesos)	Percent share of sales (%)	Cumulative percent share of sales (%)
<25.000	305	305	68	68	10908	3326940	30	30
25.001-50.000	87	392	19	87	35137	3056919	28	58
50.001-100.000	47	439	10	97	67540	3174380	29	87
100.001-150.000	9	448	2	99	123071	1107639	10	97
150.001-200.000	2	450	1	100	200000	400000	3	100
Total	450		100			11065878	100	

Note: a. Average 2003 exchange rate is 54.20 Pesos: 1 US$: 0.83 Euros
Source: Own survey

Shown in Table 4.6 are the costs incurred by farmers for the crops they produced in the season that was covered by the survey. Although the vegetable types and their production specifics vary, the values give an idea of the way farmers allocate production costs at the farm level. Majority of the farmers spend up to 25,000 pesos for vegetable production. This covers expenses for planting materials, land rent or upkeep, irrigation, hired labour, fertilizer and chemicals, tools and machinery and vehicle rental. Only 1% of the farmers surveyed spent as much as 200,000 pesos for production purposes. The values again indicate the presence of a dual structure in the agricultural sector. Majority of farmers in the province operate on small scale production. The fact that some farmers incur as much as eight times the cost of what other farmers incur means there are big farms in the province but they are fewer in number.

Table 4.6 Vegetable production costs by cost category for crops marketed in one season, Benguet in Feb-May 2003

Total costs in Philippine pesos	Absolute count of farmers	Cumulative count of farmers	Relative count of farmers (%)	Cumulative-relative count of farmers (%)
<25000	292	292	65	65
25.001- 50.000	104	396	23	88
50.001-100.000	41	437	9	97
100.001-150.000	8	445	2	99
150.001-200.000	5	450	1	100
Total	450		100	

Note: a. Average 2003 exchange rate is 54.20 Pesos: 1 US$: 0.83 Euros
Source: Own survey

Shown in Table 4.7 are the total income of farmers, grouped into four sales categories of increasing order. Income was derived by subtracting costs values from sales. Note that 43% reported having losses (negative incomes) with a mean loss of a little over 12,000 pesos. Half of the farmer respondents reported incomes less than 25,000 pesos, which equates to 54% of total incomes reported by respondents. Only 6% of the respondents received incomes between 25,000 to 50,000, but this accounts for a

third of all sales of farmers surveyed. There were no incomes higher than 100,000 pesos.

Table 4.7 Vegetable incomes in pesos, by category, Benguet farmers, Feb- May 2003

Total income (pesos)	Absolute count of farmers	Cumulative count of farmers	Relative count of farmers (%)	Cumulative-relative count of farmers (%)	Mean income/loss (pesos)	Mean income/loss by number of farmers	Percent share of incomes (%)	Cumulative percent share of incomes (%)
< 0	192	192	43	43	- 12035	-2310720	-	-
0-25.000	222	414	50	93	6783	1505826	54	54
25.001-50.000	28	442	6	99	33220	930160	33	87
50.001-100.000	6	448	1	100	61980	371880	13	100
Total	448		100			2807866		

Note: a. Average 2003 exchange rate is 54.20 Pesos: 1 US$: 0.83 Euros
Source: Own survey

Table 4.7 shows that farmers' production costs in the province are high relative to vegetable sales and that almost half of the farmers surveyed incurred negative incomes. Given the information that we have, the current farmers' sale-cost relation shows that 43% of growers obtain no incomes because production costs are higher than vegetable sales. For farmers who are involved in this situation of agriculture, farming is not sustainable on the long run, if farmers reported the data honestly. The peculiar results could be attributed to problems that researchers encountered in gathering accurate costs estimates from respondents; which was discussed earlier in Chapter 3. The flawed cost data gives a possibility that cost estimates and hence income estimates are quite unreliable.

4.7.2.2 Trader sales, costs, and incomes

In Table 4.8 are vegetable sales of traders in pesos. Almost 70% of the traders had sales of up to 25000 pesos which represents less than 1% of total market sales. Most of market sales for traders fall between 25000 to 50000 and these sales were collected by 23% of the traders surveyed.

Table 4.8 Vegetable sales in pesos, by category, in one season, Benguet traders, Feb-May 2003

Total sales (pesos)	Absolute count of traders	Cumulative count of traders	Relative count of traders (%)	Cumulative-relative count of traders (%)	Mean sales (pesos)	Mean sales by number of traders (pesos)	Percent share of sales (%)	Cumulative percent share of sales (%)
<25.000	133	133	68	68	10228	1360283	<1	<1
25.001-50.000	44	177	23	91	3596255	158235220	98	98
50.001-100.000	17	194	9	100	62394	1060700	2	100
Total	194		100		3668877	711762101		

Note: a. Average 2003 exchange rate is 54.20 Pesos: 1 US$: 0.83 Euros
Source: Own survey

Table 4.9 shows the marketing costs incurred by Benguet traders during the survey period. Costs could include payments for packing materials and hired labour and miscellaneous expenses for operations such as harvesting, hauling, packing, transporting, cleaning, grading and repacking. The costs vary depending on the range of marketing activities the trader performs. Traders' marketing costs are visibly lower than farmers' production costs, with about 80% of the traders spending less than 1000 pesos on marketing activities in the months between February and May 2003. A total of 19% spent more than 1000 pesos for marketing activities, of which only 1% spent more than 3000 pesos.

Table 4.9 Marketing costs by cost category for crops marketed in one season, Benguet traders Feb-May 2003

Total costs in Philippine pesos	Absolute count of traders	Cumulative count of traders	Relative count of traders (%)	Cumulative-relative count of traders (%)
<1000	145	145	81	81
1000- 2000	26	171	15	96
2001-3000	6	177	3	99
>3000	2	179	1	100
Total	179		100	

Note: a. Average 2003 exchange rate is 54.20 Pesos: 1 US$: 0.83 Euros
Source: Own survey

In Table 4.10 are traders' incomes for produce marketed during the time of the survey. It shows that around 4% of the traders incurred negative incomes during the survey period. Negative income can come from spending too much on marketing the crop when vegetable prices are too low to compensate costs. Again, the flawed quality of the gathered cost data (as explained in Chapter 3) is recalled. It is probable that 2003 is a special year where many farmers and traders incurred losses. However, given the data gathering experience and the nature of social interaction in communities, it is more plausible that the cost measurements failed to capture the real financial position traders are in. Given the information that we have, it appears that almost half of the traders surveyed earned proceeds of only 1000 pesos and below, representing 4% of total market share of incomes. More than 50% of the share of the incomes was collected by only 20% of the traders.

Table 4.10 Vegetable incomes in pesos, by category, in one season, Benguet traders, Feb- May 2003

Total income (pesos)	Absolute count of traders	Cumulative count of traders	Relative count of traders (%)	Cumulative-relative count of traders (%)	Mean income/loss (pesos)	Mean income/loss by number of traders	Percent share of incomes (%)	Cumulative percent share of incomes (%)
< 0	8	8	4	4	-573	-4584,96	-	-
0-1000	88	96	47	51	441	38827,624	4	
1001-2000	28	124	15	66	1427	39963,84	15	19
2001-3000	26	150	14	80	2649	68879,98	28	47
> 3000	38	188	20	100	5063	192403,12	53	100
Total	188		100		9581			

Note: a. Average 2003 exchange rate is 54.20 Pesos: 1 US$: 0.83 Euros
Source: Own survey

To sum up, it is remarkable that 68% of farmers and 68% of traders surveyed independently grossed up to 25000 pesos in vegetable sales for one season during the three-month survey period. If we assume a two- to three-season cropping period per year, then farmers and traders can earn from 50000 to 75000 in gross sales annually. The amount implies that majority of farmers and majority of traders have low sales in markets while a handful of farmers and traders have relatively larger amounts of sales. However, for farmers, the sales of the majority represent 30% of the total market sales. For traders, the sales of the majority represent less than 1% of the total market sales. In terms of incomes, 50% of the farmers surveyed earned up to 25000 pesos while only 20% of the traders earned more than 3000 pesos income in the same time period. Farmers in general earned more incomes than traders but 43% of the farmers incurred losses from vegetable production while only 4% of the traders had negative incomes from marketing. Although performance indicators for farmers and traders both show a tendency towards a dual structure; the dual structure among farmers in terms of sales, costs and incomes is more pronounced than the dual structure among traders.

Given the negative income, we need to assess if results are trustable. Earlier we mentioned that farmers and traders tend to avoid questions pertaining to financial matters, in particular, questions relating to costs and incomes because they are cautious of the consequences of giving away monetary information. The cost level method that was used to address the situation was not able to capture accurate production and marketing expenses (and incomes). Moreover, the data gathered consisted of mixed yearly costs and seasonal production costs. This created problems in accurately estimating incomes, for which revenue data comes from the observation period. Therefore, the results presented here may not reflect the real situation in the province.

From another perspective, perhaps it is just unfortunate that in the season of the survey, many farmers and traders experienced losses instead high returns. It could be possible that this is not always the case year-round.

Analysis of Margins

Marketing margins are defined as the difference between prices paid at different stages of the marketing process. It is the starting point in evaluating market margin. Marketing margins include among others, costs for packing, transportation, and storage. Normally, margins should behave constantly over homogeneous products over time even as the quantity exchanged is varying (Tomek and Robinson, 1990).

Within the province, we can distinguish a farm-gate and wholesaler margin as well as between wholesaler and provincial retailer. The total margin is measured between the prices growers received at farm-gate and the prices consumers paid to the retailer. Table 4.11 shows the margins on a per kilo basis between farm-gate and retail prices for medium grades of the three most commonly traded vegetables in the province, Irish potato, cabbage and carrots. Retail prices were gathered in the La Trinidad Trading Post and Baguio City hangar market.

Table 4.11 Mean farm gate price, retail price and margin per kilo of selected vegetables, in pesos, Benguet, Feb – May 2003

	Mean Provincial Farm Gate Price (Pesos)	Mean Provincial Retail Price (Pesos)	Margin (Pesos)	Farm price in percent Of provincial retail price (%)
	Potato			
Mean	11.4	17.4	6	65%
Mode (for medium grade)	15	20	5	75%
Std. Deviation	4.3	5.2	0.9	83%
Minimum	2	5	3	40%
Maximum	25	30	5	83%
	Cabbage			
Mean	4.6	7.5	2.9	61%
Mode (for medium grade)	3	10	7	30%
Std. Deviation	2.6	2.6	0	100%
Minimum	1,5	3	1,5	50%
Maximum	20	20	0	100%
	Carrots			
Mean	13.3	18.5	5.2	72%
Mode (for medium grade)	15	25	10	60%
Std. Deviation	6.2	5.2	-1	119%
Minimum	3	5	2	60%
Maximum	35	30	-5	117%

Source: Own Survey

Prices were recorded in the markets during the data gathering stage. It was observed that mean farm gate prices for the top three traded vegetables (potato, cabbage and carrots) are generally lower than retail prices. The average farm price is normally at 66% of the retail price for the medium grade potato, cabbage or carrots. Note however that in La Trinidad vegetable markets, it is customary for farmers to provide traders with a complimentary additional 10 kilograms of vegetables per 50-kg basket of vegetables sold as an act of goodwill towards traders (Dalmo *et al.*, 1994). In the end, this leads to an unofficial and financially-unaccounted decrease in margins on the side of the farmers.

Buying offers varied within the same crop type traded. For example, in the case of potatoes, minimum farm gate price was 2 PhP and maximum farm gate price was at 25 PhP within the 3-month data gathering period. The difference between minimum and maximum values is influenced, among others, by price fluctuations as affected by Manila demand, local supply conditions, and the type of governance structure used market the crops.

To evaluate if the offer prices that farmers received from each governance structure is significantly different from the other, an independent samples t-test comparing the equality of means of buying prices was conducted. For constancy, only the mean prices for medium grade crops that were marketed by all three trader types were used in the test. The test was conducted in pairs. The specific governance structures that are being compared are enumerated in the table.

Found in the second column of Table 4.12 are the results for the independent sample t-test under the null hypothesis that the mean buying price of commissioner-based governance for selected medium-grade vegetables is equal to the mean buying price of wholesaler-based governance. The third and fourth column are results of independent samples t-tests under the null hypothesis that commissioner mean buying prices are equal to the mean buying prices of contractors and the null hypothesis that wholesaler mean buying prices are equal to the mean buying prices of contractors, respectively. Levene's Test for equality of variances was used to adjust to unequal variances and determine which test statistic to interpret. Shown in Table 4.12 are the results. The two-tailed probability (*p*) values are written in parenthesis under the *t*-statistic.

Table 4.12 Independent samples t-test of the equality of means of buying prices from different governance structures (for selected medium-grade crops)

Type of crop	Governance Structures		
	Commissioner compared to Wholesaler	Commissioner compared to Contractor	Wholesaler compared to Contractor
Potato	0.549	2.24	-1.367
	(0.584)	(0.027)**	(0.191)
Cabbage	0.500	1.482	-1.597
	(0.618)	(0.141)	(0.127)
Carrots	-1.037	3.935	-0.848
	(0.305)	(0.000)***	(0.415)
Chinese cabbage	-5.294	-0.031	-1.822
	(0.000)***	(0.976)	(0.086)*
Green/spring onions	3.121	-0.397	1.937
	(0.008)**	(0.705)	(0.119)
Broccoli	-1.195	-1.414	0.400
	(0.247)	(0.195)	(0.695)
Lettuce (salad)	1.374	-3.510	7.446
	(0.188)	(0.002)**	(0.000)***

Notes: *, **, *** indicate 10%, 5% and 1% significance level, respectively

Table 4.12 shows that seven vegetable types were commonly marketed by commissioners, wholesalers and contractors during the observation period. Spring onions and lettuce are high value, broccoli is mid-value and the rest are low value crops.

The mean buying prices of commissioners and contractors for a low value crop like Chinese cabbage is not significantly different from each other. Wholesalers' buying offers are the highest for Chinese cabbage and are significantly different from the buying prices of the other two trader types. The mean buying prices of commissioners and wholesalers for a high value crop like lettuce is not significantly different from each other. Contractors' buying offers are the highest for lettuce and are significantly different from the mean buying prices of the other two governance structures.

For the important traditional crops like potatoes, cabbage and carrots, the buying offers of commissioners for medium grades are not significantly different from the buying prices of wholesalers. In the same vein, the buying prices of wholesalers for traditional crops are not different from the buying offers of contractors. The buying prices for cabbage and broccoli, low and mid value crops respectively, were not significantly different among the three trader types. However, for both potato and carrots, commissioners offered significantly higher prices than buying prices offered by contractors. For high value crops like spring onions and lettuce, contractors offered the highest mean buying prices, however, it is only significantly different from the other two governance structures in the case of lettuce.

From the tests it can be generalised that for low value crops, buying prices among governance structures are not significantly different from each other, however, contractors tended to offer lower buying prices relative to the other two trader types. For high value crops, contractors have a tendency to offer higher buying prices relative to the other governance structures. Their buying offers for lettuce, in particular, were significantly higher than the offers of commissioners and wholesalers.

Marketing activities done by traders such as grading transportation, cleaning and packing increase farm gate prices until they reach provincial retail rates. For this reason, the difference between the provincial price and the farm gate price is mostly attributed to traders. In section 4.5.2, we discussed that commissioners, wholesalers and contractors are the three major modes of organization that farmers use to market their produce. Table 4.13 is constructed to show the percentage share (handled) of each governance structure from the total value marketed.

Table 4.13 Percentage share from total volume marketed, Benguet Feb-May 2003

Vegetable type	**Governance Structure type**						**Total value**
	Commissioners		Wholesalers		Contractors		
	Value (in pesos)	As % of total	Value (in pesos)	As % of total	Value (in pesos)	As % of total	
Potatoes	37150	**48**	23065	30	16872	22	77087
Cabbage	25018	**66**	11229	30	1452	4	37699
Beans	8213	10	6748	8	70000	**82**	84961
Radish	12000	29	0	0	30000	**71**	42000
Chayote	10000	**100**	0	0	0	0	10000
Cauliflower	9600	38	10731	**42**	5000	20	25331
Carrots	30225	**43**	28642	**40**	12000	17	70867
Chinese cabbage	14376	**44**	6765	21	11550	35	32691
Green peas	8416	**53**	7409	**47**	0	0	15825
Green onion	8935	23	11193	29	19098	**47**	39226
Broccoli	22930	**43**	18013	34	12419	23	533612
Bell pepper	31500	**81**	7313	19	0	0	38813
Tomatoes	0	0	17160	100	0	0	17160
Celery	45000	**79**	11948	21	0	0	56948
Lettuce	17054	38	7039	16	20970	**47**	45064
Cucumber	1567	10	14416	**90**	0	0	15983

The highlighted numbers in the columns show which governance structure was responsible for marketing the highest amount of the crop in terms of market value.

Contractors appear to handle crops that are relatively higher in value than the rest. Examples are green onions and lettuce. Commissioners mediate for almost any crop in the market. They mostly handle low value crops such as potatoes and cabbage but also handle some high value crops such as celery and bell peppers. Wholesalers tend to operate in the middle, meaning, they tend to handle both high value and low value crops.

4.7.3 Barriers to efficiency and competitiveness

High production costs due to expensive seeds, machinery, fertilizers and chemicals plague the vegetable sector of Benguet. For instance, locally produced hybrid seeds are more expensive than imported types. This is because of the controlled pollination procedure and breeding work required for their production. In the long run, it was cheaper for the country to import. Seeds for temperate vegetables like cabbage are among the higher priced seeds that are locally available (Tagarino, 2001: 57-58).

Many growers borrow hand-held tractors and water pumps irrigation system because they are too costly to purchase. Unlike in developed countries, cooperatives that jointly purchase machines for the use of its members are not common in the Philippines. Farmers' limited access to production capital is another key issue. Farmers who know they can not pay in cash tend to create selling agreements with the trader-financier for the future harvests.

In the region, costs in terms of spoilage and quality loss due to transit are high. Rola (1999: 20) estimates that transport losses account for 38% of marketing costs for La Trinidad traders. Rola directly related spoilage to transportation problems and not due to inadequate post harvest facilities in the trading posts and the province in general.

The transport issue brings into focus the inadequacy of farm-to-market roads and poor condition of existing ones. Despite government efforts, so-called choke points are common in Buguias and Atok as a result of cave-ins and land slides (Dalmo *et al.*, 1994: 16). While nothing can be done to decrease Benguet's distance to its major markets, strategies to reduce transport-related spoilage can be adopted.

There is a limited amount of trading posts in other vegetable-producing municipalities of Benguet because almost all of the provincial produce is brought to La Trinidad and Baguio. One reason could be because traders prefer to concentrate in the two above-mentioned markets in order to reduce their post-harvest transportation costs. As it is, farmers, the majority of which use market-based governance structures, shoulder transportation costs when they bring harvests to La Trinidad. The lack of vegetable trading posts in high producing municipalities creates multi-layered elongated marketing channels. Trader concentration in La Trinidad and Benguet also results in farmers' losses in terms of vegetable spoilage during transit.

There remains a lot to be done in order to make the vegetable farmers of Benguet competitive. According to Macabasco (2002: 8), focus on the supply chain is important. In Benguet, the vegetable supply chain still follows a traditional sequence where traditional open markets (wet markets) continue to play a major role (Digal and

Concepcion, 2004: 9) [16]. To increase competitiveness, there is a need to improve production technologies to increase vegetable quality. There is also a need to develop of marketing infrastructure such as cold chains, packing houses and good farm to market roads. There is a need to restructure the vegetable sector in order to move towards the direction of lowered production costs, increased quality and supply reliability. Farmers need to look beyond their immediate sale and increase their awareness of consumer's changing demands.

4.8 Summary and Conclusions

This chapter made use of the integrated *Economics of Institutions* framework of Williamson and the *Structure-Conduct-Performance* (SCP) approach to analyse the Benguet vegetable sector from an institutional economics point of view. The integrated framework fused the institutional environment, governance structure and resource allocation levels of Williamson's schema with the *Structure-Conduct-Performance* (SCP) approach, respectively.

With regards to farm size structure, the total area of arable lands in the province showed a pattern of increasing hectarage from 1980 to 2002. However, farm size showed a tendency towards fragmentation and parcelization based on the tripling in total number of farms of less than one hectare in the same time period. A total of 60% of the total arable area is comprised of farms which were predominantly less than three hectares in size; leading to an observation of a dualistic structure in the distribution of land in the province. There is a high level of land ownership among farmers.

Geographic cropping strategies in Benguet exhibit the Von Thünen characteristic. Farmers nearer to the centers take advantage of the higher land rent by planting high value crops which are more perishable, more expensive to transport but sell at higher prices relative to other crops. Farmers living in the remote municipalities were observed to mostly cultivate lower value crops that are storable for longer periods of time, cheaper to transport but sell at lower prices relative to the high value crops. Observed deviations from the von Thünen theory were assumed to be attributed to the risk aversity of farmers and the physical limitations of land cultivation.

Lack of proper market infrastructures is an issue in Benguet. There are only two major vegetable markets servicing the whole province. These are the La Trinidad and Baguio City vegetable trading posts. A total of 19 warehouses for vegetable storage that are all located in La Trinidad area are all privately owned by Manila-based traders. As of 2005, there still are vegetable-producing municipalities that remain inaccessible through farm to market roads. Vegetable marketing in the region follow traditional methods, where wet markets are the primary sources of fresh vegetables for consumers and institutional buyers

The *suki* system is an institution in the vegetable sector. In this trading scheme, farmers and traders create a system of patronage where a farmer and trader regularly trade with each other in order to receive financial credits, discounts or high buying prices, means of production and allowance for delayed payment. The farmer-trader

[16] Wet markets are open air public markets where all types of food and non food commodities are sold by ambulant vendors or sellers in stalls. Commodities sold here are mostly unprocessed and fresh.

relationship that builds trust and networks in a *suki* system works to reduce opportunistic behaviour and increase cooperation on both sides as well as improve credit availability for growers. When credit is involved in the suki relationship, farmers who availed of production loans from traders are usually compelled to sell their harvests to the lender-trader, referring to *locked-in* situations. The formal rules in vegetable marketing in the province do not officially acknowledge the existence of the *suki* although there are also no regulations that sanction it. Overall, the formal institutional environment was seen to lack rules that pertain to critical transaction-related elements that are the common sources of disagreement between farmers and traders.

In terms of conduct, vegetable production per unit area is intensive. This results in the hastening of the natural erosion process and a reduction in soil fertility. Farmers in the province are therefore heavily dependent on fertilizers and chemicals to address soil fertility and pest problems. To finance production, farmers rely on agricultural-cooperatives and trader-financiers. Informal sources, in particular, wholesaler-financiers, offer easily obtainable loans, but enclose unfavourable repayment schemes. Repayment schemes trap farmers into *locked-in* situations where they find it difficult to get out of debt or *suki* trading agreements. Agricultural cooperatives have been inefficient with regards to the agricultural loan issue. Their own lack of coordination and lack of monetary sources within the cooperative imply that they are unable to provide countervailing power and financial credit even to farmer-members.

Almost three quarters of the farmers surveyed obtain price information from other farmers although only one third of the farmers admitted knowing the correct market prices. Government-led agencies tasked to collect and disseminate price information were cited by only a minor number of respondents. Not knowing market prices results in lower bargaining power for farmers, and survey results showed evidence that traders set the price in almost 90% of farmer transactions.

There are three governance structures that farmers commonly use to market their crops. There are the commissioner-led market-based, wholesaler-led partly-market-partly-credit based, and contractor-led partly-market part-relation-based modes of governance. The three structures are discussed more in detail in Chapter 6 and 7.

In terms of performance, farmers' sales values show evidence of the presence of many small farmers in the province conducting small scale production. There were also a few farmers conducting large-scale production. The duality of sales distribution among farmers is linked to the initial observation of the duality of the farm size structure in the region. Trader sales values similarly point to a dual structure, where many small traders divide a small share of total market sales among themselves while fewer traders account for a higher share of market sales. Due to the suspected flawed quality of the gathered cost data, cost and income estimates were assumed to be suspect. This is particular to the observation that 43% of the farmers and 4% of the traders earned negative incomes during the survey period. It is probable that 2003 is a special year where many farmers and traders incurred losses. However, it is more plausible that the cost measurements failed to capture the real financial situation traders are in.

Initial margin analysis showed that farm prices for the most commonly traded crops comprise 66% of the provincial retail price. This does not include however, the additional 20% complimentary vegetables that farmers provide for traders for every 50-kg basket of vegetables bought.

An analysis of the difference in the price offers of commissioners, wholesalers and contractors was conducted using the means of buying prices for selected medium-grade vegetables. Buying offers of commissioners for medium-grade traditional crops like potatoes, cabbage and carrots are not significantly different from the buying prices of wholesalers. Similarly, the buying prices of wholesalers for traditional crops are not different from the buying offers of contractors. However, commissioners offered significantly higher prices than buying prices offered by contractors for potato and carrots. For high value crops like spring onions and lettuce, contractors offered the highest mean buying prices, however, it is only significantly different from the other two governance structures in the case of lettuce.

It can be generalised that for low value crops, buying prices among governance structures are not significantly different from each other although contractors tended to offer lower buying prices relative to the other two trader types. For high value crops, contractors have a tendency to offer higher buying prices relative to the other governance structures.

An analysis of percentage shares from the total volume marketed gives evidence that commissioners mediate for almost any crop, although survey values show they have a tendency to sell lower value crops. Wholesalers mediate also for almost any crop, although survey results show they have a tendency to mediate for mid-value vegetables. Contractors tend to buy higher value crops.

Finally, several barriers to increased efficiency and competitiveness of the vegetable sector of the province were discussed. Farmers are led to borrow money from informal sources due to high production costs, limited access to production capital and means of production. Transportation problems stemming from poor or missing farm to market roads lead to high transport costs and quality loss during transit. Despite government efforts, so-called choke points are common and bring into focus the inadequacy of farm-to-market roads and poor condition of existing ones.

A few targeted strategies were suggested in order to direct the sector towards increased competitiveness. These include focusing on the supply chain to improve production technologies, develop marketing infrastructure and move towards mode demand-driven production.

Annex to Chapter 4. Examples of formal rules in La Trinidad and Baguio City markets

The following are municipal ordinances regulating La Trinidad Trading post and Baguio city Hangar market.

LTVTP Ordinance No. 42 and 43 -97 (approved September 2, 1997)

- *In order to protect farmers and middlemen from fraudulent behaviour in the trading post, the local government has ordered the issuance and mandatory wearing of identification cards for all persons doing business in the area.*

- *In order to reduce traffic and congestion in the trading areas during peak hours, the local government has ordered the establishment of a colour coding scheme where certain vehicles are prohibited from entering the trading area at certain days of the week.*

LTVTP Ordinance No. 19-95, Chapter IV Art 1, Section 12 (approved November 21, 1995)

- *In order to ensure the smooth flow of vegetable trading operations, the following acts and activities were forbidden in the trading area:*
  1. *Making rented booths as residences*
  2. *Selling or drinking intoxicating drinks*
  3. *Selling items not considered as vegetables, except in the canteen*
  4. *Driveway obstruction*
  5. *Repairing and cleaning of vehicles*
  6. *Loitering*
  7. *Entry of vehicles loaded with chicken manure*
  8. *Washing and drying laundry*
  9. *Gambling and other illegal activities*
  10. *Parking in the trading area when not loading or unloading vegetables*
  11. *Blocking stairways and centre alleys of the Bagsakan (depot) area*
  12. *Leaving waste on areas not designated as garbage depositories*
  13. *Vegetable retailing*
  14. *Entering the trading post drunk*
  15. *Bringing firearms and deadly weapons except for knives used for vegetable trimming*
  16. *Entrance of people with communicable diseases*
  17. *Selling vegetables with high toxicity*
  18. *Washing of vegetables*
  19. *Entrance of private vehicles not used for trading*
  20. *Overnight parking*
  21. *Entrance of ten wheeler trucks*

LTVTP Ordinance No. 19-95, Chapter IV Art 1, Section 13 (approved November 21, 1995)

- *The following activities were especially mentioned:*

1. *People selling food, refreshments and cigarettes in the LTVTP or in the adjacent alleys are required to obtain business permit from the municipal government*
2. *Intercepting producers with the intention of dissuading them to proceed to the LTVTP in order to buy their vegetables is unlawful (harang method)*
3. *Vegetable transactions must only be done within the LTVTP perimeter*
4. *Vandalism and damage to LTVTP properties is unlawful*
5. *Employees of the administration of the LTVTP as disallowed to engage in vegetable transactions or receive gratuities from any licensee, seller or buyer in the LTVTP premises.*

LTVTP Ordinance No. 19-95, Chapter IV Art 3, Section 18, 34, 35, 38 and 39 (approved November 21, 1995)

- *All wholesalers are required to acquire a special business permit and are prohibited from monopolising any of the "Bagsakan" areas. The bays are used on a first come first served basis to producers and wholesalers. The application for a special business permit is subject to screening by the mayor's office. Wholesalers are required to sign a "booth lease agreement" with the local government. Viajeros or vegetable transporters are required to obtain a business permit and license from the mayor's office. Vegetable porters must be accredited by the municipal government.*

- *Booth lessees and wholesalers who violate any of the rules and regulations shall have their business permits revoked and his contract lease cancelled.*

Since the Baguio City Hangar is mostly for retail activities, there are few ordinances pertaining to the actual transaction itself. In fact, most of the ordinances refer to fees to be paid wholesalers and retailers, since rental space is expensive in the city.

BCH Ordinance No. 2000-01, Chapter XVIII, Section 146 and Chapter XIX, Section 147a and 148 (approved January 2000)

- *No vendor can occupy more than one stall in the market.*

- *Rentals are payable within the first 20 days of each month. Non-payment would result in cancellation of the lease contract.*

BCH Ordinance No. 2000-01, Chapter XVIII, Section 150 (approved January 2000)

- *Market entrance fees in Baguio City Hangar market would be based on basket size and type of vegetable entered. Bigger baskets with a diameter of >1foot and height of >1foot are taxed higher. Similarly, high value vegetable produce such as cauliflower and broccoli pay higher market entrance fees.*

Chapter 5: Measuring the Social Capital of indigenous farming communities of Benguet

5.1 Introduction

One of the earliest studies of Philippine social capital was by Buenavista (1998: 1-4) who observed fishing practices and hierarchical patron-client relationships of dynamite fishermen. Buenavista indicated that illegal dynamite fishing is widely practiced because patrons (fishermen) and clients evolved a gift-giving culture that encouraged the environmentally unsustainable practice. Benigno (2002: 1) discussed a study conducted by the Nomura Research Institute (NRI), a Japanese firm involved in corporate strategy. He stated that foreign investors shy away from the Philippines not only because of the country's socio-economic or infrastructure problems but also because of certain "undesirable" Filipino traits.

The study alluded that Filipinos associate many aspects of their lives with self-interests. The prevailing attitude of "family first" shows that the Filipinos are more family- than nation-oriented unlike Japan or Korea. Because of its archipelagic-structure and geographical-language barriers, technology and knowledge transfer is difficult. These factors largely contribute for the slow development of a national-trust culture. Considering that the Philippines is predominantly agricultural, the issue now is whether the Nomura research findings can sustain itself in agricultural settings.

The neglect of policy makers, together with several agro-ecologic and socio-economic constraints has made the province of Benguet in northern Philippines a less favoured area. However, the chapter wants to investigate if indigenous agricultural communities of the province who cultivate vegetables in a long standing tradition are also less endowed in terms of social capital. This chapter attempts to answer, the following research questions: ***Does social capital exist in indigenous agricultural communities of Benguet and in what form? What factors influence social capital? How can social capital affect vegetable marketing in the province?***

5.2 Objectives of the Chapter

The general aim of this chapter is to investigate social capital in the farming communities of Benguet, northern Philippines. To accomplish the general aim, specific objectives are:

1. Determine which factors motivate social capital formation among farmers and traders and in the farming communities as a whole
2. Analyze social capital levels for farmers and traders and per municipality and by evaluating micro-level cognitive and structural social capital.
3. Evaluate whether respondent attributes such as education, gender, religion, age and ethnicity influence community social capital
4. Discuss how social capital levels can affect the present and future of the vegetable industry

The rest of the chapter is divided into two parts. The first part consists of a detailed introduction to social capital theory and its application to Benguet vegetable economy

in Sections 5.3. The methodology on how social capital was captured and the creation of the social capital index is discussed in 5.4.

Part two contains the results beginning with discussion on principal component analysis in 5.5.1 followed by calculation of cognitive and structural social capital levels in 5.5.2. Hierarchical cluster analysis is conducted in 5.5.2.5. The research highlights in 5.6 presents correlation, Kruskal-Wallis and binomial test results against independent social capital indicators. Section 5.6.6 discusses the effect of social capital on current and future vegetable marketing in the province. Summary and concluding remarks are in Section 5.7.

5.3 The Social Capital Theoretical Framework

5.3.1 Social Capital, the market and the economy

Sociologists and economists assert that results of long-term economic development efforts hinge strongly on the levels of national, regional or local social capital (Ostrom and Ahn, 2001: 16). The role of trust, networks and ethnic ties are beneficial and necessary for government success and improvement of society's welfare (World Bank, www.worldbank.org). In terms of how social capital can positively influence market transactions, Beugelsdijk and Schaik (2001: 6) stated that social capital works by increasing communication, inter-action, information transfer and thus co-operation between transacting partners without the influence of power and market. Trust can make people go beyond the requirements of the contract through early delivery, higher quality or some other means to support their good intentions and sustain trust.

5.3.2 Social capital Framework

Grootaert and Bastelaer (2002: 4-5) suggest developing methodologies that match the specific social capital element being evaluated. Krishna and Shrader (2000) suggest aggregating and analyzing indicators of structural and cognitive social capital and collective action *after* being independently assessed. Their framework in Figure 5.1 was adopted.

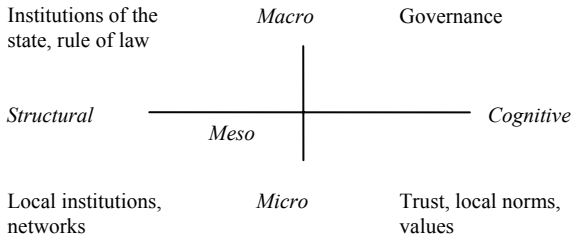

Figure 5.1 Forms and Scope of Social capital
Source: Grootaert and Bastelaer, 2002

The first concept observed is structural social capital. Structural social capital is tangible and deals with formal institutions. It includes membership in formal networks, particularly in local organizations like the church and local government. The second concept observed is cognitive social capital. Cognitive social capital is perceived as embedded within the people and thus, intangible. This is in the form of

trust, local ethics, traditions and morals. Social capital measurement occurs along a continuum from the micro to the macro dimension. *Micro* social capital captures horizontal networks and norms that motivate these associations. M*eso* social capital describes vertical and horizontal interaction. *Macro* level social capital examines the wider institutional and political sphere.

5.3.3 Applying Social capital theory to Benguet vegetable markets

More recently, interaction between the Kankanaey and Ibaloi tribes resulted in a mixing of traditions and beliefs such that the difference at present is mostly linguistic and not cultural. Fierce tribal wars that separated groups before have given way to free trade and harmonious inter-ethnic relations. Within agricultural communities, farmers and traders interact freely with each other. They are parts of the same informal social networks within the municipalities. Farmers and traders may be involved in different lines of work but there is no delineation between them in terms of intra-community social participation. Since farmers and traders inclination is primarily agricultural; they interact repeatedly within communities with similar backgrounds. Farming has been the way of life for most of the people in the province, with the Kankanaeys having relatively more involvement in agriculture and agricultural trade (Russel, 1989).

Davis (1973: 211-230) conceived the term "economic personalism" to describe the kinship and *suki* system (favoured buyer) of social organization in Baguio markets. The *suki* system is defined by "*highly personal relationships where individuals interrelate in ...more than purely economic dimensions*". Farmers and traders try to include reciprocity and relationship-building into vegetable trade in order to increase benefits from transaction agreements. Increasing the level of connectedness by participating in informal networks leads to collective action in the pursuit of common goals. Temptations to achieve short run personal wealth through the transaction are superseded. In exchange systems where personal relationships are present, knowledge and information is easily disseminated leading to decreased information asymmetry and opportunistic behaviour (Beugelsdijk and Schaik, 2001: 8).

In social capital theory, repeated interactions lead to increased trust levels. According Beugelsdijk and Schaik (2001: 6), trust is present when you expect your partner not to exploit your vulnerability based on the expectation that your partner will perform the duties that are expected of them. In Benguet however, despite highly personal relations, information asymmetry and opportunistic behaviour is not only entrenched but also used as a strategy by farmers and traders for profit gains (Milagrosa, 2001: 81). A study by Batt (2001:16) on Benguet potato farmers and their seed suppliers showed that despite repeated interactions, no connection between trust and the length of farmer-trader relationship could be established. As farmers buy potato seed supplies from preferred sellers, they simultaneously consider offers from others. Farmers' commitment to a relationship is related to their satisfaction of trader performance rather than trust. This chapter will attempt to establish baseline social capital information from the province in order to shed light on the seemingly contradictory findings of earlier researches.

5.4 Data and Method

5.4.1 Methodology

The World Bank (WB) asserts that no standard measure of social capital can be achieved, since social capital measurements are dependent on the definition rendered by researchers. However, the WB suggested three approaches to social capital measurement. *Quantitative studies* by Knack and Keefer (1997) or Narayan and Pritchett (1999), c*omparative analysis* by Putnam (1993) or Light and Karageorgis (1994) and q*ualitative approach* by Portes and Sensenbrenner (1993), Gold (1995) and Heller (1996). No approach is superior to others in measuring social capital. Grootaert and Bastelaer (2002: 60) argued that empirical social capital data analyses could utilize either approach since no standard calculation procedures exist.

5.4.2 The social capital Index

Except for membership in local organizations, all items were obtained using a 5-point scale. To normalize the 5-point scale, the individual value for cognitive social capital indicators $\frac{SCIndicator_{ij} - 1}{4}$ was used where *ij* refers to the cognitive social capital dimension of farmer *i* in municipality *j*. The product was multiplied by a factor representing the within group weight (*wgw*) of the variables being analyzed. The *within group weight* depends on the number of items measuring the indicator. Thus for the cognitive social capital CSC_{ij} :

$$CSCij = \left(\frac{(\sum_{j=1}^{J} associatedness_{ij}) - 1}{4} * wgw \right) + \left(\frac{(\sum_{j=1}^{J} trust_{ij}) - 1}{4} * wgw \right) + \left(\frac{(\sum_{j=1}^{J} goalsperceptions_{ij}) - 1}{4} * wgw \right) + \left(\frac{(\sum_{j=1}^{J} optimismsat_{ij}) - 1}{4} * wgw \right) \quad (1)$$

i=1…, I and j=1…, J

where CSC_{ij} is the cognitive social capital of farmer *i* in municipality *j*; $associatedness_{ij}$ is the associatedness levels of farmer *i* in municipality *j*; $trust_{ij}$ is the trust levels of farmer *i* in municipality *j*; $goalsandperceptions_{ij}$ is the goals and perceptions of farmer *i* in municipality *j* and $optimismsat_{ij}$ is the optimism and satisfaction of farmer *i* in municipality *j*.

Later, the resulting indicator cognitive values were weighted equally and standardized to 50. Thus, 0 means no cognitive social capital and 50 means full cognitive social capital. Since active membership in local organizations were provided using forthright answers, structural social capital values are calculated by obtaining the percentage equivalent and then similarly standardizing responses to 50. The outcomes reflect actual memberships into specific formal institutions. This would mean for each farmer (and therefore, each municipality) a value of 0 for no membership at all and a value of

50 for membership in all formal organisations enumerated. To achieve a social capital index, structural and cognitive values were simply added.

Because of a lack of previous work on social capital in the province, the study preferred to test the simpler quantitative-additive approach (assuming equal weights). Grootaert and Bastelaer (2002) point out that what is important is to attempt to capture social capital in its cognitive and structural dimensions. For this reason, *first*, a Likert scale (1= highly disagree and 5= highly agree) measured farmer and trader perceptions on cognitive and structural social capital statements. These statements were taken from previous international researches on social capital. Statements and questions in those researches that were found to be relevant to the study were included in the Benguet questionnaire. To measure *optimism and satisfaction*, three questions were used (Cronbach α=0.439). Five questions were used to measure *common goals and perceptions* (Cronbach α= 0.661) while nine statements were used to measure *trust* levels (Cronbach α=0.846). Five statements were used to gauge informal *civic associatedness (*Cronbach *α*= 0.794*).* The Cronbach alpha value of social capital statements altogether is 0.844. Lastly, using forthright yes/no questions, six items were used to measure formal networks through active membership in local organizations.

Second, an equation was used to model cognitive and structural social capital. Caution is given in the presentation and aggregation of social capital results in Section 5.5.2. Following Grootaert (2002: 56) a preference for separate presentation of structural and cognitive social capital *first*, before aggregating a single social capital index *second*, is conducted. This is because the two indicators capture different dimensions of social capital that are significant in their own right.

5.5 Networks and trust: deconstructing social capital of indigenous agricultural communities in Benguet

5.5.1 Principal Component Analysis of Social Capital Indicators

To resolve which of the cognitive and structural indicators drives social capital, principal component analysis was performed on aggregated statements from farmers and traders. As shown in Table 5.1, six components were loaded from the initial factor analysis. These components explain 66% of the variance before and after Varimax rotation. To determine which factors are relevant, the Kaiser criterion where initial Eigenvalues less than 1 are excluded was used[17]. Coefficients in the final rotated component matrix results were sorted by size. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is equal to 0.834 while the Bartlett's test for Sphericity significance is at 0.000 both indicating that Factor Analysis would be useful for the data since it contains significant inter-variable relationships.

[17] Factor loading significance depends on sample size (Field, 2000: 440). On larger samples, smaller factor loadings could be statistically important. The study follows Stevens (1992:382 in Field, 2000:440) where, based on an alpha level of 0.01, loadings greater than 0.298 could be considered significant for sample sizes greater than 300.

5.5.1.1 Dimensions Underlying Social Capital for farmers and traders

The statements that load highly on Factor 1 all seem to relate to the quality of casual peer-to-peer associations. This factor is labelled as *Informal Networks*. This component shows the strong positive correlation of getting along with people in the community (Eigenvalue of 0.876) to Factor 1. Farmers who value informal networks find it highly important to get along with community members. The second set of variables relates highly towards trust within the immediate environment, particularly trust of his family, neighbours, farmers, the church and respondents' own feelings of trustworthiness. This factor is named as '*Core Trust'*. This shows that respondents assign highest importance to familiars and to religion. Putnam (1993) refers to this as the bonding element of social capital.

Factor three shows attitudes related to trust in the formal institutional environment with emphasis on the legal system, police and municipal government. It is named *'Institutional Trust'*. Positive significant relationship between trusting the municipal police and institutional trust shows that respondents who have high scores in trusting institutions also tend to trust the municipal police highly. This is referred to as the bridging element of social capital Putnam, 1993). The fourth factor is labelled as '*Poverty perceptions'*. Two factors loaded heavily for this component: poverty because of laziness and poverty because of lack of life opportunities.

Table 5.1 Rotated Component Matrix results for aggregated farmer and trader statements

	Component					
Statements	Informal networks	Core trust	Institutional trust	Poverty perception	Common goals	Life satisfaction
I get along well with people in my community	**,876**	,084	,127	-,034	,139	,077
I get along well with other farmers	**,850**	,075	,108	,012	,114	,018
I get along well with family and friends	**,823**	,101	,050	-,029	,157	,056
I get along well with other traders	**,708**	,133	,178	,068	,070	,045
I participate actively in community and volunteer for community work	,310	,097	,187	-,192	,211	,131
I trust family and friends	,158	**,779**	,080	,131	,037	,061
I trust the church and its people	,158	**,740**	,280	,073	,052	,176
I trust other farmers	,130	**,737**	,231	,089	,057	,096
I feel safe in my neighbourhood	,111	**,734**	,262	,027	,131	,070
I can safely say I am trustworthy	-,070	**,702**	-,049	,328	,136	-,062
I trust municipal police	,164	,212	**,844**	,103	,011	,126
I trust the legal system	,177	,219	**,840**	,098	,030	,149
I trust municipal govt and their policies towards agriculture	,224	,256	**,689**	-,240	,169	,155
People are poor because they are lazy and have no will power	,004	,230	,004	**,881**	,056	-,006
People are poor because they are not given the same chances as others	,002	,205	,078	**,880**	,105	-,036
Local government should concentrate on fighting rising input prices	,134	,070	,088	,086	**,817**	,074
Country must create more job opportunities	,252	,010	,096	,003	**,760**	,058
Community members should get more involved in policy making	,075	,189	-,047	,077	**,732**	,004
The local government treats everyone equally	,074	,012	,269	-,148	,135	**,691**
I am satisfied and happy with my life	,388	-,088	,045	-,296	,027	**,649**
my life will get even better in the future	-,096	,298	-,154	,338	,077	**,564**
Do you agree that most people could be trusted?	,017	,171	,271	,103	-,032	,481

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 6 iterations. Source: Own survey

The fifth factor is a measure of community aspirations and is termed '*Common goals'*. It relates to objectives shared by farmers and traders in terms of the thrusts the community and local government should focus on. Fighting rising input prices loaded heavily for this Factor (Eigenvalue 0.817). It means that farmers and traders who loaded highly on the "common goals" attribute find the issue of rising input prices important. Factor 6 loads heavily on statements related to "*Life satisfaction*". Equal treatment, life satisfaction and
optimism largely contribute to this component. Respondents who find equal treatment from the government important would load highly on the life satisfaction component.

5.5.2 Structural and Cognitive Social capital: aggregated for Municipalities

5.5.2.1 Cognitive Social Capital (CSC)

Cognitive social capital indicator values range from 0 (no cognitive social capital) to 50 (full cognitive social capital). As a reference level, the mean value for all municipalities in cognitive social capital is taken. This is equal to 29.8 in the lower right cell of Table 5.2. Cognitive social capital scores did not vary greatly among municipalities. Compared to the reference level of 29.8, Atok, Bakun, Buguias and Itogon have higher total cognitive social capital scores than the municipal means. Buguias municipality had the highest associatedness scores (8) which is higher than the 7.8 aggregate mean for associatedness for all municipalities. La Trinidad constituents were most trusting with a score of 6.9, higher than aggregate trust average of 6.6. Itogon residents shared the most common goals and perceptions at 9.6, higher than reference aggregate average of 9.3. The most optimistic and satisfied with their lives were Itogon residents who scored 6.9, higher than reference aggregate mean of 6.1. Table 5.2 shows the full CSC scores.

Table 5.2 Cognitive social capital per municipality and mean values, Benguet 2003

Social Capital Indicators	Atok	Bakun	Bokod	Buguias	Itogon	Kibungan	La Trinidad	MEAN
Associatedness	7,9	7,9	7,6	8,0	7,6	7,8	7,5	7,8
Trust	6,8	6,4	6,3	6,7	6,5	6,4	6,9	6,6
Common Goals and Perceptions	9,4	9,5	8,9	9,5	9,6	9,3	9,1	9,3
Optimism and Satisfaction	6,2	6,4	5,7	6,3	6,9	5,8	5,7	6,1
Cognitive Social Capital	30,3	30,3	28,6	30,6	30,7	29,3	29,2	29,8

Source: Own survey

Overall, the highest average scores for cognitive social capital comes from common perceptions and goals while the lowest mean scores are from optimism and satisfaction indicators. When individual municipal cognitive social capital values were compared against the municipal mean using a t-test, no significant differences from the mean were found.

5.5.2.2 Structural Social Capital (SSC)

The values for structural social capital were obtained as actual memberships of respondents in formal organisations. Thus, structural social capital equals:

$$SSC_{ij} = \sum_{j=1}^{7} membership_{ij} \qquad (2)$$

i=1…, I and j=1…, J

where SSC_{ij} is the structural social capital of respondent i in municipality j and $membership_{ij}$ is the membership of farmer i in municipality j to the various formal organizations presented in the questionnaire.

As shown in Table 5.3, the highest total membership in any formal organization enumerated by the study is for **neighbourhood organisations** with a mean of 7.7. This is followed by membership in religious groups with a mean of 3.8. The respondents were least involved in political groups. Using the aggregated means for municipalities as a reference level (7.1 at the lower right cell of Table 5.3), La Trinidad residents scored the highest total structural social capital with a score of 8.6. Bokod residents were the least involved with the formal organizations with a score of 4.7.

Table 5.3 Structural Social Capital, per municipality and mean values, Benguet 2003

	Atok	Bakun	Bokod	Buguias	Itogon	Kibungan	La Trinidad	MEAN
Religious group	5,4	3,0	3,3	4,2	3,6	2,6	4,2	3,8
Political group	0,9	0,3	0,1	0	0,3	0	0,1	0,2
Farmer cooperative	4,9	3,3	1,9	4,4	3,1	2	3,7	3,3
Trader cooperative	4,2	4,8	2,7	4,1	3,9	0,8	2,6	3,3
Middlemen cooperative	0,9	1,1	0,4	0,3	0,3	4,4	2,6	1,4
Local government	2,3	1,5	2,7	2	1,3	0,3	1,5	1,6
Neighbourhood group	11,3	6,9	8,5	8,1	6,9	4,6	7,7	7,7
TOTAL Structural Social Capital	8,3	7,1	4,7	7,8	6,5	7,0	8,6	7,1

Source: Own survey

When individual municipal structural social capital values were compared against the mean using a t-test, no significant difference from the mean was found. Note that the values used for the previous calculations indicate actual memberships and does not differentiate between active and inactive memberships. We assumed that membership to a formal organization implies being active in it[18].

[18] When we looked at active membership, we discovered that the respondents are most active in farmer cooperatives (26%) followed by religious associations (24%). However, similar to the results above, the respondents are least active in political groups (2%). Following Grootaert (2002), we attempt to capture purely structural social capital by showing it in formal membership values. Therefore, we keep the results from Table 5.3 for social capital index calculation later on.

5.5.2.3 Municipal Social Capital Index (SCI)

A social capital index shown in Table 5.4 for each municipality was computed by adding cognitive and structural social capital values. Social capital index is therefore:

$$SCI_j = CSCij + SSCij \quad (3)$$

where SCI_j=social capital index for municipality j.

Table 5.4 Social capital among farmers and traders in Benguet vegetable markets, by municipality and mean values Benguet 2003

Social Capital	Atok	Bakun	Bokod	Buguias	Itogon	Kibungan	La Trinidad	MEAN
Cognitive	30,3	30,3	28,6	30,6	30,7	29,3	29,2	29,8
Structural	8,3	7,1	4,7	7,8	6,5	7,0	8,6	7,1
Total SC	38,6	37,2	33,2	38,4	37,1	36,3	37,8	36.9

Source: Own survey

Municipalities were well below the 50 midpoint on which all calculations were benchmarked. Four municipalities had cognitive scores higher than the mean. Only three out of seven municipalities have structural scores higher than the average. Atok had the highest social capital at 38.6 while Bokod had the lowest social capital 33.2. A paired sample t-test comparing each municipality's mean cognitive, structural and total social capital scores with the aggregated cognitive, structural and total social capital mean showed that the social capital means of the municipalities of Atok, Bokod and Buguias differed significantly from the aggregated mean. This means that Atok and Buguias have significantly higher social capital scores than the mean scores for all of the municipalities covered in the research. Bokod scored significantly lower social capital scores than the means of all municipalities summed up together. The rest of the municipalities did not differ significantly from the mean.

Initially, high cognitive and structural social capital scores for municipalities were expected on the basis of social capital theory. In particular, ethnicity, the remoteness of the research area and common agriculture-related goals were predicted to bind the societies together. During the course of the interviews however, a surprising trend of low trust and low membership in formal organisations began to emerge, irrespective of tribal affiliation and municipal location.

5.5.2.4 Social capital between groups: farmer-trader comparisons

To find out whether social capital formation is distinct among farmers and traders, factor analysis were conducted on separate groups. Table 5.5 shows the ranked components extracted from each respondent type. Rotated component matrices show that different factors drive social capital formation among farmers and among traders. Among farmers, the Eigenvalue of the first factor extracted –informal networks - explains 28.7% of the total variance. For traders, the Eigenvalue of the first factor extracted – outer core trust – explains 21.6% of the total variance. Outer core trust

includes trust towards neighbourhood, church and towards farmers. Compared to farmers, traders seem to distinguish between different levels of trust. Whereas farmers assign highest importance to informal networks, traders consider trust towards neighbours, the church and farmers most valuable. This is perhaps an allusion to the skills needed because of the peer-to-peer nature of their job.

Table 5.5 Ranking of component results for factors driving social capital formation of farmers and traders, Benguet 2003 (components arranged according to decreasing importance)

FARMERS	TRADERS
Informal networks	Outer core trust
Core trust	Informal networks
Institutional trust	Institutional trust
Common goals	Common goals
Poverty perception	Poverty perception
Life satisfaction	Core trust
	Life satisfaction

Note: Details of the test are shown in the appendix. Source: Own survey

What is interesting to note in the separate factor analyses is that "core trust" loaded heavier among farmers but loaded less important and farther for traders. It is assumed that because farmers live in more remote areas and are less exposed to opportunism in business relations compared to traders; their core trust ranks heavier than for traders, in the formation of social capital. For traders, "core trust" loaded negatively. In Appendix 4, the negative sign (-0.540) indicates that there is a significant negative relationship between traders' own trustworthiness and "core trust" perceptions. Quite simply, for farmers who have a positive attitude towards core trust, the issue of self trustworthiness is irrelevant.

Shown in Table 5.6 are social capital scores comparing farmers and traders. From mean values, farmers shared fewer common goals and perceptions and had lower optimism and satisfaction than traders in general. Farmers have better community relations than traders. This however, is not statistically different. From the overall trust scores (composed of core and external trust) it appears that farmers and traders have equal levels although a deeper look at survey results showed that of those farmers who use commissioners as distribution channels, 60% accompany the agents when they search for buyers for farmers' produce. Moreover, 73% of growers agree that traders tend to withhold price and volume information from them. On the other hand, only 46% of the traders suspect that farmers withhold volume and quality information from them. Total social capital of traders is higher than of farmers at 33.3 versus 37.1. The difference is statistically significant. Are farmers having less social capital than traders or is it because of the nature of their jobs?

Table 5.6 Social capital comparison between farmers and traders, Benguet 2003

INDICATOR	FARMERS	TRADERS
Associatedness	7,8	7,7
Trust	6,6	6,6
Common goals and perceptions	9,2	9,5
Optimism and satisfaction	6,1	6,4
Total Cognitive	29,7	29,9
Total Structural	3,6	7,1
Social Capital	33,3	37,1

Source: own survey

A closer look however, reveals that although in both social capital types traders scored higher than farmers, the real difference lies in their respective memberships in formal associations. Paired samples t-test proves that cognitive scores for farmers and traders are not statistically different from one another but structural social capital scores are. Traders are more active in formal organisations than farmers leading to higher structural social capital values. Overall, traders have higher social capital scores because they are more active in formal organizations than farmers. Traders have higher tendency to join groups because of the intensity of their transaction schedules. Joining formal organisations facilitates trader transactions because it opens up networking possibilities. Traders know early on that well-placed connections are highly important in local vegetable trade because these can ultimately determine incomes or losses.

Although farmers and traders are part of the same social networks and organizations, it appears that the real cause of their social capital originates from different elements. Farmer social capital is affected by bonding aspect of social capital: he trusts persons within the family circle and those within his immediate environment. Trader social capital is more the bridging type, the type of capital that comes from knowing people outside the immediate social network (Woolcock, 1999; Grootaert and Bastelaer, 2002).

5.5.2.5 Hierarchical Cluster Analysis

Hierarchical cluster analysis was conducted to check for interdependent relationships between municipalities. The primary objective of analysis was to determine if the surveyed municipalities could be classified into homogenous groups (called *clusters*) based on their structural and cognitive social capital variables. Objects belonging to a cluster group are said to be relatively similar in terms of the variables considered in clustering them and different from the objects in other groups (Malhotra, 1996: 671).

Hierarchical cluster analysis of structural and cognitive social capital indicators from Table 5.2 and 5.3 revealed mutual relationships between variables. Figure 2 illustrates that Cluster A is composed of the predominantly Kankanaey municipalities of Bakun and Buguias and the Ibaloi communities of Itogon and Bokod. Bakun and Itogon are strikingly similar, joined at approximately Distance 1. They merge at Distance 2 with Buguias and then again at Distance 5 with Bokod to form Cluster A.

Cluster B is composed of Kankanaey-populated Atok and La Trinidad. The two municipalities merged at around Distance 13. Cluster C is composed of Kankanaey Kibungan all by her lonesome.

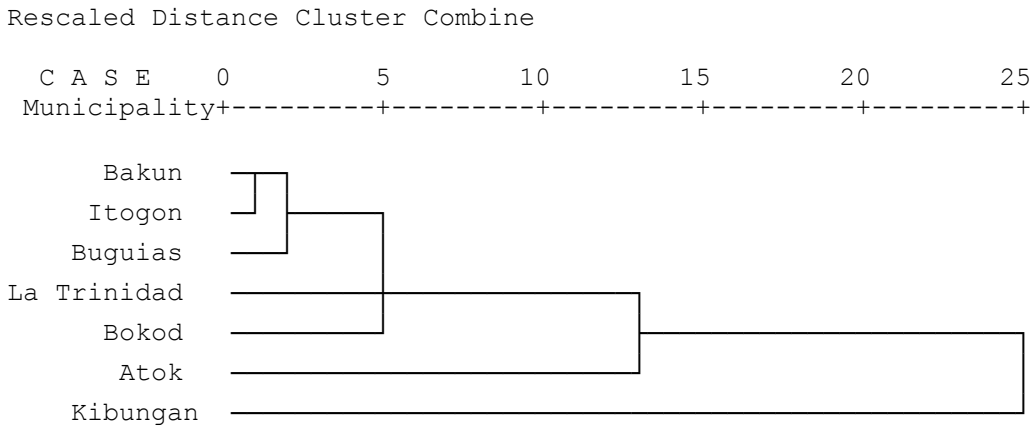

Figure 5.2 Dendrogram from hierarchical cluster analysis of municipalities based on social capital indicators

The clusters reveal important aspects regarding ethnicity when placed within the context of underlying social capital elements. It also opened up more interesting questions regarding inter-municipality social capital formation. The groupings showed that ethnicity unites (or conversely, divides) communities. Bakun and Itogon are similar in terms of social capital despite being populated by different tribes. Does this imply that the Kankanaeys and Ibalois share more things in common than was originally perceived? On the other hand, predominantly Kankanaey municipalities such as Atok and La Trinidad were very similar to each other despite the physical distance separating the two. Looking deeper at social capital results for each group revealed that Kankanaey communities, exhibited more trust than Ibaloi communities. They also reported better relationships with people in the communities as compared to the other tribe. Ibaloi-based municipalities exhibited less participation in formal networks compared to Kankanaey communities.

Calculating social capital based on ethnicity proved that Kankanaey municipalities had relatively higher social capital (37.5) than Ibaloi municipalities (35.8) although the results are not statistically significant. During the Spanish occupation of the Philippines, the Ibaloi communities remained unconquered because of their fierce resistance to the Spaniards. Thus, their culture remained intact and untouched by foreign influence. Could this be the reason for their exclusivity? Kankanaey tribes of northeast Benguet were equally resistant to the conquerors but the building of an access road from central and eastern Luzon that linked their municipalities to the outside world eased the introduction of people, beliefs and unfamiliar elements to their culture. Could this be the reason why they were less exclusive and got along better with people in their communities?

A possible explanation is that, historically, Bakun and Itogon became bound when the government built hydroelectric power plants in their localities against the will of the population. Bokod's Ambuklao and Binga Dams bind it with the first two municipalities. According to Waters (1990: 19), one can drop or reinvent their self identification according to circumstances they faced. Could the experience of having a dam built against their wishes bring the Kankanaey and Ibaloi sentiments together? The survey revealed that Bakun and Itogon had the same low scores for in the government. Bokod and Itogon resulted in the two lowest scores for trust in the legal

system. Bakun and Buguias had almost similar low scores for their perceptions on equality in government treatment. The underlying reason why Cluster A is composed of municipalities dominated by different tribes mean that there is more to social capital formation in these communities than meets the eye.

5.6 Research highlights

5.6.1 Social Capital and Gender

Does gender influence social capital? From frequency counts, 34% of the females reported that they are satisfied and happy with their lives compared to only 28% of the males. Likewise, more females were optimistic about life than males (52% versus 48%) and more females reported good relations with people in the community than males (65% versus 61%). Volunteerism occurs slightly more often in males (35%) than in females (32%). Table 5.7 shows significant gender correlation with some social capital indicators.

Table 5.7 Correlation coefficients between social capital indicators and Gender

Social capital Indicator	Correlation Coefficients (2 –tailed test of significance)
Optimism about life getting better	0.079*
Satisfaction and happiness about life	0.121**
Volunteering for community work	0.084*
Good relationship with people in community	0.085*

*. Correlation is significant at the 0.05 level (2-tailed)
**. Correlation is significant at the 0.01 level (2-tailed)
Source: Own survey

To confirm if there is a difference between males and females in terms of the gender-correlated social capital indicators, the Kruskal-Wallis test was conducted. We applied the non-parametric ANOVA test of Kruskal and Wallis because one of the variables is nominal (e.g. gender) and the other is ordinal (5 point scale). The hypothesis and results are in Table 5.8.

Table 5.8 Kruskal-Wallis tests for gender and social capital variables

Hypotheses	Asymptotic Sig. (1-tailed)	Decision Rule
H0: There is no difference in men and women in terms of optimism H1: Women are more optimistic	0.362	Accept H0
H0: There is no difference in men and women in terms of satisfaction and happiness H1: Women are more satisfied and happier with their lives	0.030	Reject H0
H0: There is no difference in men and women in terms of voluntary work H1: Men do more voluntary work.	0.389	Accept H0
H0: There is no difference in men and women in terms of informal community networks H1: Women have better relationships in the community	0.245	Accept H0

Source: Own survey

The Kruskal-Wallis test confirms correlation and frequency test results that women are more satisfied and happy with their lives. There is no difference between men and women in terms of optimism, community participation in terms of voluntary work and strength of informal community networks. According to Reid and Salmen (2002: 99), Mali women were shown to play a key role in tapping community social capital because they were disinterested in the power struggle in their communities and maintained good working and social relationships despite community factions.

5.6.2 Social Capital and Educational attainment

Does education influence social capital? From frequency counts, respondents with a university degree (equivalent to 14 years of education) scored the highest in life satisfaction. They also scored highest in general trust, trust in the church and trust in the municipal government. Respondents with secondary education scored lowest in general trust (only 6% think most people could be trusted). Table 5.9 shows that education is significantly correlated with some social capital indicators.

Table 5.9 Correlation coefficients between social capital indicators and educational attainment

Social capital Indicator	Correlation Coefficients (2 –tailed test of significance)
Satisfaction and happiness about life	0.135**
General trust	0.105**
Trust of family and friends	0.093*
Trust of church	0.081*
Trust of municipal government	0.085*

*. Correlation is significant at the 0.05 level (2-tailed)
**. Correlation is significant at the 0.01 level (2-tailed)
Source: Own survey

The next step is to test if there is a difference between high educated (those with University degree) and low educated people (those with primary school and secondary education). It is expected that high education lead to higher satisfaction/happiness and higher trust. The hypotheses and their corresponding results are presented in Table 5.10.

Table 5.10 Kruskal-Wallis tests for education and social capital variables

Hypotheses	Asymptotic Sig. (1-tailed)	Decision Rule
H0: There is no difference in high educated and low educated in terms of life satisfaction and happiness H1: Higher educated people are more satisfied and happier with their lives	0.000	Reject H0
H0: There is no difference in high educated and low educated in terms of general trust H1: Higher educated people have higher levels of general trust	0.003	Reject H0
H0: There is no difference in high educated and low educated in terms of trust of family and friends H1: Higher educated people have more trust towards family and friends	0.015	Reject H0
H0: There is no difference in high educated and low educated in terms of trust of church H1: Higher educated people have more trust towards the church.	0.700	Accept H0
H0: There is no difference in high educated and low educated in terms of trust of municipal government H1: Higher educated people have more trust towards the municipal government.	0.060	Reject H0

Source: Own survey

Except for trust towards the church, the Kruskal-Wallis tests confirm the alternative hypothesis that respondents with higher education generally exhibit more trust than lower-educated people. University-educated people were also more satisfied and happy with their lives than non-educated respondents. Studies show that social capital and education are mutually reinforcing. High levels of social capital have been correlated with higher educational achievement, more confidence in political institutions and higher satisfaction in the government (Brehm and Rahn, 1997; Alesina and Ferrara, 2000). This is because higher educated people take more active interest in their children's education and are more committed to cultivation of groups, teams and organisations.

5.6.3 Social Capital and Religion

Does religion influence social capital? From frequency counts, most of the respondents who were not active members of any church disagreed with most social capital statements presented. Table 5.11 shows that religion is significantly correlated with some social capital indicators.

Table 5.11 Correlation coefficients between social capital indicators and religion

Social capital Indicator	Correlation Coefficients (2 –tailed test of significance)
Satisfaction and happiness about life	0.436**
Volunteering for community work	0.325**
Trust in municipal government	0.305**
Good relationship with people in community	0.313**

**. Correlation is significant at the 0.01 level (2-tailed)
Source: Own survey

The next step is to test if there is a difference between actively religious people and non-religious people. It is expected that religious people have more satisfaction/happiness and volunteerism. They are also predicted to have more trust in the municipal government and have better relationships in the community. The hypotheses and their corresponding test results are in Table 5.12.

Table 5.12 Kruskal-Wallis tests for religion and social capital variables

Hypotheses	Asymptotic Sig. (1-tailed)	Decision Rule
H0: There is no difference in religious and non-religious in terms of satisfaction and happiness H1: Religious people are more satisfied and happier with their lives	0.000	Reject H0
H0: There is no difference in religious and non-religious in terms of volunteering for community work H1: Religious people volunteer more for work	0.000	Reject H0
H0: There is no difference in religious and non-religious people in terms of trust of municipal government H1: Religious people trust the municipal government more	0.000	Reject H0
H0: There is no difference in religious and non-religious in terms of good relationships with people in the community H1: Religious people have better relationships with people in the community.	0.000	Reject H0

Source: Own survey

Kruskal-Wallis test results lead to the conclusion that the religious and non-religious are not similar in terms of life satisfaction and happiness, volunteerism, trust towards the government and quality of relations with other community members. Regular worship meetings bind the community by encouraging the formation of community networks and by providing a feeling of belongingness and community. Through church activities, interpersonal relationships are nurtured and enriched.

5.6.4 Social Capital and Age

Does age influence social capital? The respondents were categorized into two groups namely; Group 0 (young), from 0-35 years old and Group 1 (old) from 36 to 99 years old. Using frequency counts, it was discovered that 33% of the respondents fall into the first group and 67% into the second group. “Young” and “old” groups were discovered similar in frequency scores for getting along with other farmers, but the older group had higher memberships in religious groups (18% versus 26%). More

farmers in the "old" category were members of farmer co-operatives (28% versus 19%), of the local government (4% versus 2%) and of neighbourhood groups (17% versus 12%). Table 5.13 shows that age is significantly correlated with some social capital indicators.

Table 5.13 Correlation coefficients between social capital indicators and Age

Social capital Indicator	Correlation Coefficients (2 –tailed test of significance)
Getting along with other farmers	.081*
Membership in religious group	.132**
Membership in farmer co-operative	.133**
Membership in local government	.90*
Membership in neighbourhood group	.144**

*. Correlation is significant at the 0.05 level (2-tailed)
**. Correlation is significant at the 0.01 level (2-tailed)
Source: Own survey

The next step is to test if there is a different between young and old respondents. It is expected that older people have better relationships with other farmers, and are more active in all the formal organizations. Because age is scalar, the binomial test was conducted. The hypotheses and their corresponding test results are in Table 5.14.

Table 5.14 Binomial tests for age and social capital variables

Hypotheses	Asymptotic Sig. (1-tailed)	Decision Rule
H0: There is no difference between old and young people in terms of getting along with other farmers H1: Older respondents are better at getting along with other farmers	.000	Reject H0
H0: There is no difference between old and young people in terms of membership in religious groups H1: Older respondents are more active members in religious groups	.000	Reject H0
H0: There is no difference between old and young people in terms of membership in farmer co-operatives H1: Older respondents are more active members in farmer co-operatives	.002	Reject H0
H0: There is no difference between old and young people in terms of membership in the local government H1: Older respondents have more active memberships in the local government	.411	Accept H0
H0: There is no difference between old and young people in terms of membership in the local neighbourhood groups H1: Older respondents have more active memberships in local neighbourhood groups	.011	Reject H0

Source: Own survey

Test results lead to the conclusion that older people tend to be more active in organizations such as religious groups, co-operatives and local neighbourhood gatherings. Young and old are similar in commitment to politically inclined groups. In general, older respondents have better quality relations with other farmers than the younger respondents. In a UK study, a higher number of older people reported to be regular participants in organizations than younger people. Only 15% of the surveyed men and 10% of the surveyed women aged 16-24 were active in at least 2 organizations whereas 24% of the men and 24% of the women aged 64 onwards were active in at least 2 associations[19].

5.6.5 Social Capital and Ethnicity

Ethnicity impacts how we behave and act. Dialect spoken is a major attribute that bonds members of an ethnic group. Does ethnicity, measured through mother tongue

[19] see http://www.official-documents.co.uk/document/deps/doh/survey00/sch/sch01.htm

influence social capital? Respondents were categorized into two groups. The first group is composed of those who are considered native to the province by speaking either Ibaloi (31%) or Kankanaey (58%). Together, the two tribes comprise 89% of the respondents. The second group is composed of the rest of the respondents who spoke other dialects which are not native to the province. Table 5.15 shows that ethnicity through mother tongue is correlated with several social capital indicators.

Table 5.15 Correlation coefficients between social capital indicators and Ethnicity

Social capital Indicator	Correlation Coefficients (2 –tailed test of significance)
Trust municipal government	-.074*
Participate actively in community and volunteer	-.100**
Get along well with other traders	.074*
Active membership in a Trader co-operative	.095**
Active membership in the local government	-.080*

Note: Kendall's tau_b was used
Source: Own survey

There is a significant negative correlation between ethnicity and trust in the municipal government, volunteerism and active membership in the local government. There is significant positive correlation between ethnicity and relationship with other traders and membership in a trader co-operative. The next step is to test if there is a significant association between ethnicity and social capital elements. Test hypothesis and test results using Kruskal-Wallis are shown on Table 5.16.

Table 5.16 Kruskal-Wallis tests for ethnicity and social capital variables

Hypotheses	Asymptotic Sig. (1-tailed)	Decision Rule
H0: Trust in the municipal government is independent of ethnicity H1: Trust in the municipal government is dependent on ethnicity	0.023	Reject H0
H0: Active participation in the community and volunteerism is independent of ethnicity H1 Active participation in the community and volunteerism is dependent on ethnicity	0.010	Reject H0
H0: Getting along well with traders is independent of ethnicity H1: Getting along well with traders is dependent on ethnicity	0.054	Reject H0
H0: Active membership in traders co-operative is independent of ethnicity H1: Active membership in traders co-operative is dependent on ethnicity	0.005	Reject H0
H0: Active membership in local government is independent of ethnicity H1: Active membership in local government is dependent on ethnicity	0.197	Accept H0

Kruskal-Wallis test results show that ethnicity is independent of participation in local government politics but plays a large role in terms of trust towards the government, informal community participation/volunteerism and relationship/membership with traders and their organisations. Literature confirms that indigenous households were more participative in community organisations than non indigenous ones. Higher levels of social capital were reported in indigenous rural areas than urban areas Krishna and Shrader, 2000. However, ethnic divisions can also strongly affect social interaction and can hinder the development of social capital. Trust appears to decrease when people live in a society with strong ethnic divisions (Alesina and Ferrara, 2000). Moreover, social participation is higher where ethnic segmentation is lower (ibid). According to Pantoja (2002: 126), ethnic exclusionary activities can encourage "closed-groups" formation and discourage social capital formation. This is particularly true when a group holds certain beliefs, which are actually false.

5.6.6 Benguet social capital and local vegetable trade

Low social capital exists among indigenous agricultural communities in Benguet northern Philippines. Our tests have shown that consistent low scores on memberships in formal associations and trust overrides high scores on common goals and informal networks. Considering that vegetable exchange in the province is characterized by interpersonal trade between farmers and traders, low social capital could be one important limiting ingredient towards efficient market transactions.

Perhaps one of the reasons why favoured buyer system sustained itself is because of low social capital. On the one hand, the system ensures those who are favoured can easily dispose of their harvests in the market. On the other hand, those who are not within this system are left out. This means that key players on both sides are not able to fully exploit market possibilities. Favoured farmers are compromised to sell their crops to selected traders who may not have the highest price offers. Favoured sellers are compromised to buy crops from selected farmers who may not have the best vegetable grades. Aside from low membership rates, perhaps one of the reasons of the failure of farmer cooperatives in the province to evolve as a bargaining force to reckon with is because of low solidarity among farmer-members. Low solidarity can come from low social capital when farmers look into cooperatives for pursuing personal interests. This results in low collective bargaining powers among farmers.

The importance of formal networks must not be overlooked because active membership in organizations could serve as conduit between farmers and traders to other market institutions. Stone and Hughes (2001) argued that personal ties could emerge from involvement in formal associations because they foster repeated interaction among people with common interests. Formal institutions can also provide access to resources that would have not been possible in an informal relationship.

Low trust within Benguet markets spells higher transaction costs for parties. In the province, contracts are normally unwritten and incomplete because of unstable vegetable prices. Trust should be called upon in order to maintain the contract and oversee transaction completion. When trust is low, negotiation and enforcement costs increase because both parties are not convinced that the other is honest in their transaction. When both parties can rely on each other to meet their ends of the deal, risk and uncertainty is reduced. Explicit cooperation can be expected, even without explicit contracting.

High social capital facilitates information exchange about prices and markets (Chloupkova and Bjornskov, 2002). In Benguet where market information is scarce and unreliable, social capital is needed in order to disseminate critical market news in the quickest manner. Farmers and traders can rely on dense informal networks at the micro level as cheap but effective means to spread information.

5.7 Summary and Conclusions

A total of 450 farmers and 195 traders from seven municipalities of Benguet were asked for opinions on 22 social capital statements and membership on seven community associations. Quantitative-additive method was used to calculate cognitive and structural social capital scores and create social capital index. Six components were underlying social capital was threshed out from pooled Principal Component analysis. These were informal networks, core trust, institutional trust, poverty perception, common goals and life satisfaction. Independent factor analyses for farmers and traders showed that informal networks and outer core trust, respectively, loaded heavily in terms of social capital motivations in the province.

Social capital scores for farmers showed that they had significantly better community relations than traders. Traders scored higher memberships in formal organisations and for this reason; their overall social capital index was higher. For both farmers and traders, social capital is in its strongest in the form of common goals and informal networks. Membership in formal associations and low trust pulled social capital down. In sum, all municipalities scored below the assigned 50 (middle point of the total range) for social capital.

With regards to municipal means, the municipalities of Atok and Buguias scored significantly higher social capital than the mean scores for all of the municipalities covered in the research. Bokod scored significantly lower social capital scores than the means of all municipalities summed up together. The rest of the municipalities did not differ significantly from the mean.

Social capital in Benguet is influenced, in varying degrees, by gender, education, religion, age and ethnicity. Although there is no difference among men and women with regards to optimism, community participation and informal community networks, the study pointed to the evidence that women are happier with their lives than men. Investing in education for the population is important because higher education people generally exhibit more trust than lower educated people. It follows that it will be relatively easier to facilitate collective action and foster a national trust culture when the population is higher educated. Our tests showed that religious people volunteer more and participate more in community activities, trust the local government more, foster better community relationships and are generally more happy and satisfied with their lives than non-religious people. For this reason, the influence of religion to move people towards volunteerism, cooperation and government trust should not be underestimated. Religious groups can be called upon for their manpower and support in times of need and therefore should receive proper recognition from local government and society.

In terms of age, our tests showed that the youth are less active in religious organizations, neighbourhood groups and in farmer cooperatives. Younger respondents were less inclined to socialize with other farmers. It seems that the youth are overlooking the positive effects of formal associations. Providing them with activities that promote collective action, venues for exchange as well as recognizing and rewarding their efforts will encourage more interaction in informal and formal settings. In this manner, community participation and a sense of responsibility is

instilled on them during their formative years. Ethnicity affects community relations in a profound manner. Tests revealed that ethnicity influences local government trust, community participation and volunteerism and membership into trader organizations. Culture dictates how members of an ethnic group participate in society on a formal level or informal association.

Social capital affects vegetable production and marketing in the province in more profound ways that expected. Low social capital resulted in the encouragement of the favoured buyer system that limits marketing possibilities for farmers and traders. Low solidarity resulted in the failure of farmer cooperatives to provide bargaining leverage to farmers in marketing crops. Because contracts are incomplete, market participants incur higher negotiation and monitoring costs as they can not rely on trust alone to oversee transaction completion. Social networks are not sufficient to facilitate valuable information exchange about prices and markets.

The study highlights the important role of carefully directed policies from the local governments of the agricultural communities in fostering social capital. Because infrastructure and resource are at their control, the local governments can initiate efforts to increase intra and inter-community social interaction. Tests showed that farmers' and traders' social capital stem from different sources. Therefore, the focus should be on increasing the bridging element of social capital; to begin with, increasing positive interaction between farmers and traders. Later, steps to build links across different networks and organizations in the external environment can be taken. By providing opportunities for local cohesion, local citizens can be mobilized to think and act collectively.

Annex to Chapter 5: Appendix Tables

Appendix Table 1 KMO and Bartlett's Tests from Section 5.5.1

	Farmers	**Traders**
Kaiser-Meyer-Olkin Measure of sampling adequcy	0.849	0.745
Bartlett's test of Sphericity Sig.	0.000	0.000
Rotated Sums of Squared loadings	67.501 Cumulative %	69.122 Cumulative %
Number of extracted components	6	7

Appendix Table 2 Correlation matrix of social capital statements

	Better life in the future	the local government treats everyone equally	i am satisfied and happy with my life	do you agree that most people could be trusted?	i can safely say i am trustworthy	i trust family and friends	i feel safe in my neighborhood	i trust the church and its people	i trust other farmers	i trust municipal govt and their policies towards agriculture	i trust municipal police	i trust the legal system	i participate actively in community and volunteer for	i get along well with family and friends	i get along well with people in my community	i get along well with other farmers	i get along well with other traders	country must create more job opportunities	community members should get more involved in policy	local government should concentrate on fighting rising	people are poor because they are lazy and have no will power	people are poor because they are not given the same chances as
SC1	1,00	0,16	0,10	0,10	0,33	0,28	0,18	0,20	0,22	0,03	0,13	0,14	0,01	0,00	-0,01	-0,02	0,01	0,05	0,11	0,14	0,25	0,25
SC2	0,16	1,00	0,38	0,24	-0,04	0,06	0,15	0,24	0,16	0,33	0,28	0,29	0,15	0,14	0,20	0,14	0,18	0,14	0,12	0,15	-0,11	-0,08
SC3	0,10	0,38	1,00	0,17	-0,22	0,04	0,06	0,11	0,03	0,28	0,16	0,18	0,24	0,34	0,36	0,28	0,23	0,17	0,02	0,10	-0,22	-0,24
SC4	0,10	0,24	0,17	1,00	0,09	0,18	0,25	0,30	0,24	0,24	0,24	0,26	0,13	0,07	0,09	0,09	0,12	0,10	0,02	0,07	0,14	0,07
SC5	0,33	-0,04	-0,22	0,09	1,00	0,58	0,40	0,40	0,41	0,07	0,16	0,20	-0,01	0,02	0,02	0,02	0,09	0,10	0,19	0,18	0,40	0,39
SC6	0,28	0,06	0,04	0,18	0,58	1,00	0,52	0,52	0,50	0,27	0,34	0,33	0,11	0,25	0,20	0,19	0,20	0,12	0,15	0,16	0,28	0,29
SC7	0,18	0,15	0,06	0,25	0,40	0,52	1,00	0,63	0,54	0,39	0,38	0,38	0,23	0,19	0,23	0,17	0,24	0,13	0,26	0,18	0,26	0,24
SC8	0,20	0,24	0,11	0,30	0,40	0,52	0,63	1,00	0,68	0,39	0,40	0,42	0,16	0,20	0,23	0,24	0,29	0,16	0,19	0,15	0,27	0,27
SC9	0,22	0,16	0,03	0,24	0,41	0,50	0,54	0,68	1,00	0,38	0,37	0,35	0,09	0,20	0,22	0,22	0,22	0,13	0,17	0,18	0,27	0,27
SC10	0,03	0,33	0,28	0,24	0,07	0,27	0,39	0,39	0,38	1,00	0,58	0,59	0,27	0,29	0,37	0,30	0,30	0,23	0,11	0,25	-0,09	-0,07
SC11	0,13	0,28	0,16	0,24	0,16	0,34	0,38	0,40	0,37	0,58	1,00	0,80	0,17	0,24	0,28	0,27	0,26	0,14	0,05	0,15	0,09	0,16
SC12	0,14	0,29	0,18	0,26	0,20	0,33	0,38	0,42	0,35	0,59	0,80	1,00	0,25	0,24	0,29	0,25	0,33	0,15	0,08	0,14	0,09	0,15
SC13	0,01	0,15	0,24	0,13	-0,01	0,11	0,23	0,16	0,09	0,27	0,17	0,25	1,00	0,28	0,28	0,27	0,23	0,19	0,17	0,15	-0,08	-0,02
SC14	0,00	0,14	0,34	0,07	0,02	0,25	0,19	0,20	0,20	0,29	0,24	0,24	0,28	1,00	0,75	0,64	0,45	0,31	0,18	0,27	-0,01	0,03
SC15	-0,01	0,20	0,36	0,09	0,02	0,20	0,23	0,23	0,22	0,37	0,28	0,29	0,28	0,75	1,00	0,72	0,58	0,33	0,17	0,26	-0,01	0,00
SC16	-0,02	0,14	0,28	0,09	0,02	0,19	0,17	0,24	0,22	0,30	0,27	0,25	0,27	0,64	0,72	1,00	0,58	0,30	0,15	0,25	0,02	0,01
SC17	0,01	0,18	0,23	0,12	0,09	0,20	0,24	0,29	0,22	0,30	0,26	0,33	0,23	0,45	0,58	0,58	1,00	0,25	0,20	0,16	0,07	0,06
SC18	0,05	0,14	0,17	0,10	0,10	0,12	0,13	0,16	0,13	0,23	0,14	0,15	0,19	0,31	0,33	0,30	0,25	1,00	0,38	0,56	0,05	0,06
SC19	0,11	0,12	0,02	0,02	0,19	0,15	0,26	0,19	0,17	0,11	0,05	0,08	0,17	0,18	0,17	0,15	0,20	0,38	1,00	0,44	0,17	0,17
SC20	0,14	0,15	0,10	0,07	0,18	0,16	0,18	0,15	0,18	0,25	0,15	0,14	0,15	0,27	0,26	0,25	0,16	0,56	0,44	1,00	0,11	0,17
SC21	0,25	-0,11	-0,22	0,14	0,40	0,28	0,26	0,27	0,27	-0,09	0,09	0,09	-0,08	-0,01	-0,01	0,02	0,07	0,05	0,17	0,11	1,00	0,79
SC22	0,25	-0,08	-0,24	0,07	0,39	0,29	0,24	0,27	0,27	-0,07	0,16	0,15	-0,02	0,03	0,00	0,01	0,06	0,06	0,17	0,17	0,79	1,00

Appendix 3 Rotated Component Matrix for Benguet Farmers 2003 (supplement for Table 5.5)

	Component					
	Informal networks	Core trust	Institutional trust	Common goals	Poverty perception	Life satisfaction
my life will get even better in the future	-,163	,416	-,146	,061	,236	,459
the local government treats everyone equally	,089	,008	,321	,104	-,156	,676
i am satisfied and happy with my life	,376	-,048	,035	,036	-,303	,648
do you agree that most people could be trusted?	,048	,165	,171	-,029	,131	,565
i can safely say i am trustworthy	-,002	,749	-,075	,090	,313	-,068
i trust family and friends	,173	,807	,097	,048	,119	,063
i feel safe in my neighborhood	,192	,691	,295	,187	,040	,145
i trust the church and its people	,183	,711	,294	,062	,081	,187
i trust other farmers	,110	,745	,254	,074	,077	,055
i trust municipal govt and their policies towards agriculture	,241	,225	,716	,163	-,243	,176
i trust municipal police	,176	,195	,861	,062	,120	,108
i trust the legal system	,216	,210	,827	,023	,127	,222
i participate actively in community and volunteer for community work	,377	,096	,129	,242	-,061	,269
i get along well with family and friends	,829	,099	,095	,196	-,027	,086
i get along well with people in my community	,881	,068	,161	,163	-,046	,082
i get along well with other farmers	,860	,110	,114	,139	-,012	,003
i get along well with other traders	,719	,190	,196	-,010	,132	,080
country must create more job opportunities	,222	,050	,082	,753	-,003	,073
community members should get more involved in policy making	,076	,108	-,014	,744	,135	,039
local government should concentrate on fighting rising input prices	,135	,118	,104	,805	,013	-,009
people are poor because they are lazy and have no will power	,018	,256	-,004	,032	,885	-,036
people are poor because they are not given the same chances as others	,003	,211	,079	,122	,891	-,029

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 7 iterations.

Appendix Table 4 Rotated Component Matrix for Benguet Traders, 2003 (supplement for Table 5.5)

	Component						
	Outer core trust	Informal networks	Institutional trust	Common goals	Poverty perceptions	Core trust	Life satisfaction
my life will get even better in the future	-,033	,041	,104	,119	,385	-,403	,594
the local government treats everyone equally	,148	-,036	,066	,171	-,102	,134	,759
i am satisfied and happy with my life	-,068	,366	,077	,008	-,226	,269	,614
do you agree that most people could be trusted?	,216	-,047	,352	-,073	,320	,380	,305
i can safely say i am trustworthy	,353	-,240	,246	,312	,229	-,540	-,116
i trust family and friends	,458	,126	,336	,070	,061	-,514	,002
i feel safe in my neighborhood	,812	-,090	,087	,018	,145	-,057	-,022
i trust the church and its people	,827	,101	,241	,032	,163	-,001	,098
i trust other farmers	,786	,190	,239	,030	,109	-,052	,065
i trust municipal govt and their policies towards agriculture	,404	,146	,573	,187	-,120	,304	,040
i trust municipal police	,217	,101	,847	-,089	,003	-,036	,153
i trust the legal system	,168	,025	,854	,107	,001	-,024	,014
i participate actively in community and volunteer for community work	-,004	,059	,128	,117	-,090	,570	,081
i get along well with family and friends	,052	,825	-,004	,064	-,061	-,115	,036
i get along well with people in my community	,073	,853	,097	,134	-,020	-,057	,099
i get along well with other farmers	,040	,792	,065	,079	,084	,157	,037
i get along well with other traders	,057	,573	,045	,364	-,135	,251	-,044
country must create more job opportunities	-,081	,300	,129	,785	,020	,096	,024
community members should get more involved in policy making	,377	,066	-,247	,667	,049	-,060	,104
local government should concentrate on fighting rising input prices	-,024	,120	,119	,817	,178	-,032	,164
people are poor because they are lazy and have no will power	,193	-,060	-,060	,129	,894	-,049	-,023
people are poor because they are not given the same chances as others	,168	-,012	,011	,066	,869	-,157	-,093

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 7 iterations.

Appendix Table 6 Social capital comparison between Benguet farmers and traders (supplement for Table 5.6)

Municipality		Associatedness	Trust	Common goals & perceptions	Optimism & satisfaction	Total Cognitive	Total Structural (Formal memberships)	Social Capital
Atok	Farmers	8.1	6.8	9.5	6.0	30.4	5.4	35.8
	Traders	7.7	6.8	9.3	6.4	30.2	8.3	38.5
Bakun	Farmers	7.8	6.6	9.2	6.3	29.9	3.5	33.4
	Traders	7.9	6.3	9.9	6.5	30.6	7.0	37.7
Bokod	Farmers	7.1	6.2	8.7	5.9	28.0	3.7	31.7
	Traders	8.1	6.4	9.1	6.5	29.1	4.7	33.8
Buguias	Farmers	8.3	6.8	9.9	6.3	31.3	3.8	35.1
	Traders	7.7	6.6	9.1	6.3	29.8	7.8	37.6
Itogon	Farmers	7.6	6.2	9.4	6.5	29.9	3.2	33.0
	Traders	7.6	6.8	9.8	7.2	31.4	6.5	37.9
Kibungan	Farmers	8.1	6.7	9.1	5.8	29.7	1.9	31.6
	Traders	7.5	6.1	9.5	5.8	28.9	7.0	35.9
La Trinidad	Farmers	7.7	6.7	8.7	5.6	28.7	3.5	32.2
	Traders	7.3	7.0	9.5	5.8	29.7	8.6	38.3
Mean	Farmers	7.8	6.6	9.2	6.1	**29.7**	**3.6**	**33.3**
	Traders	7.7	6.6	9.4	6.2	**30.0**	**7.1**	**37.1**

Chapter 6. Transaction attributes and transaction costs of governance structures in Benguet vegetable marketing

6.1 Introduction

Hobbs (1995) defined a transaction as "*an exchange which occurs between two stages of the production/distribution chain as the product changes in form and/or in ownership rights*". His description threads together previous definitions of Ménard (2000), that transactions are a "*transfer of rights*" and Williamson (1996: 58-59) that transactions are essentially production activity[20]. In essence transactions are two sided exchange mechanisms characterized by performance and counter-performance and the transfer of property rights (Slangen, 2005: 30). The costs associated with reaching and implementing economic exchange or carrying out and organizing the transaction are called transaction costs (Hobbs, 1995; Ménard, 2000; Slangen, 2005). Transaction costs are sometimes called hidden costs because activities that appear to be costless such as setting up, revising and enforcing economic events, have invisible elements associated with them. These elements come in the form of the cost of the time and effort spent on information gathering and negotiation, monitoring and enforcement of the transaction. Transaction costs arise because of the assumption that market players exhibit bounded rationality and display opportunism. The amounts of these costs depend on the critical attributes of the transaction, that is, asset specificity, frequency and uncertainty (Douma and Schreuder, 1998: 129).

In vegetable marketing transaction costs can come from three general activities: searching/information, negotiation/bargaining, and monitoring/enforcement of the agreement. The magnitudes of the transaction costs depend on the type of governance structure that regulated the transaction. For example, Benguet farmers who intend to sell harvests in the trading post incur direct marketing costs in the form of transportation, labour, packing materials, and storage rental. However, less obvious marketing costs involves the measures the farmer took in order to be informed about the current market prices for his vegetables. Moreover, the farmer will engage in price negotiation, the intensity of which depends on the type of governance structure he chooses to sell his crop. The same holds true for monitoring and enforcement of the transaction. These activities involve decisions and actions, and these may result in costs, the magnitude of which depends on the type of governance structure used.

In Chapter 5, we discussed how social capital in the agricultural communities of Benguet can influence the formation of marketing arrangements and flow of vegetable trade in the province. Chapter 6 takes off from that discussion to analyze more closely the existing marketing arrangements for distinctive transaction attributes based on activities conducted within each governance structure. *With knowledge on transaction attributes, this chapter will evaluate which modes of marketing organization are the most optimal in vegetable trade, that is, those that operate in the most transaction costs minimizing manner.*

[20] "A transaction occurs when a good or service is transferred across a technologically separable interface", (Williamson, 1996:58).

6.2 Objectives of the Chapter

This chapter analyzes the vegetable marketing system of Benguet by looking at governance structures used in exchange from a transaction attribute and transaction cost perspective. More specifically, the chapter objectives are:

1. To identify and characterize governance structures used in the vegetable marketing system,
2. To describe and analyse transaction attributes and transaction costs of each governance structure;
3. To determine which governance structure operates in a transaction-cost minimizing manner relative to other modes of organization, and;
4. To align governance structures with the most cost minimizing contract types based on transaction attributes.

The rest of the chapter is divided into two parts. The first part contains the theoretical arguments. First, the three trader types and three general contract types are introduced in Section 6.3. Then, the framework for analysis which includes concepts on behavioural assumptions, transaction attributes and transaction costs is presented in 6.4.

The second part of the chapter contains empirical results. Section 6.5.1 characterizes transactions using behavioural and transaction attributes discussed in the theoretical part. In 6.5.2 transaction costs were estimated based on a discussion of specific transaction attributes of each trader type. A cost minimization approach that determines the most efficient cost-minimized alignment of contract types based on transaction attributes is presented in section 6.5.3. The chapter ends with conclusions in 6.6.

6.3 Coordination mechanisms in transactions

Coordination through commissioners is the customary and most common arrangement for vegetable exchange in the province followed by wholesalers and contractors. As discussed in Chapter 4, marketing vegetables through "traditional" trading partners marks the long history of farmer-trader relations in the province. Within the three aforementioned governance structures, farmer-trader relationships are governed by a contract. Some contracts are short, others are more intensive. Whether the contract is optimal for the transaction depends on the basic attributes of the transaction itself. By optimal we mean that the governance structure that is used supports a contract type that that exhibits transaction attributes that incurs the least transaction costs. Based on various combinations of the three critical attributes of transactions; asset specificity (non-specific, mixed and idiosyncratic), frequency (occasional and recurrent), and uncertainty (exogenous to the transaction and endogenous to the transaction) an optimal governance structure is realizable (Lyons and Mehta, 1997: 46-50). Whatever the resulting optimal governance structure for a system, it must be one that minimizes most on transaction costs (Buckley and Chapman, 1997: 127).

The three mentioned governance structures make us of certain types of contractual arrangements. There are many different kinds of contracts, which we can classify into

three general types, based on several salient characteristics. The three contract types are given in Table 6.1.

Table 6.1 Three general contract types

Contract Type	Classical Contract	Neoclassical contract	Relational contract
Contract duration	Short relationship duration	Relationship duration longer	Long term relationship
Frequency of exchange	Occasional exchange/transaction	Occasional to recurrent exchange/transaction	Recurrent exchange/transaction
Coordinating mechanism	Price is main coordinating mechanism	Price and safeguards coordinate actions	Relationship is main coordinating mechanism, price less important
Focus of control	Immediate transaction	Fulfilling contract terms	Relationship
Interest in gains	Self interest in gains	Self-interest in gains, but reciprocity is valued	Reciprocity highly valued, Mutual interest in gains
Role of safeguards	Safeguards are of little importance	Price and safeguards are important	Safeguards very important
Identities of transacting parties	Identities of transacting parties irrelevant	Identity of transacting parties known, and sometimes transaction decisive	Identity of transacting parties known and important and is transaction decisive
Disagreements and renegotiation	Transaction disagreements renegotiated by parties involved, Arbitrator sometimes included	Transaction disagreements re-negotiated by parties involved, Arbitrator sometimes included	Transaction disagreements negotiated by parties involved
Governance structure supporting the contract	Market-based	Hybrid	Hybrid

Source: Slangen 2005: 36 and Peterson *et al.*, 2001: 157

Market-based governance structures support contracts that are classical in nature. The farmers could transact with one trader today, but the next day could be another trader. The most important driving force in this governance structure is the price. Transacting parties are interested in self gain and therefore, the identities of transacting partners are insignificant. Safeguards, in case the transaction fails, are missing. For people involved in the exchange, the intensity of transaction control is low.

Hybrid (part-market, part-credit based) governance structures support contracts that are neoclassical in nature. Within one season, the farmers could transact more than once with the same wholesaler. The important coordinating mechanisms in this governance structure are the elements embedded in the neo-classical contract; the safeguards and the price. Albeit partner identities are known, this does not imply that a transaction will occur. Hence, although reciprocity is valued in the exchange, self interest in gains still exists. Failed transactions could be renegotiated by parties involved or with an arbitrator. In this type of governance structure, the intensity of transaction control for people involved in the transaction is higher than that of the market.

Hybrid (part-market part-relation based) governance structures support contracts that are long-term and relational in nature. The contracts are said to be relational because

transactions held under it consider relationship-building as the most important motivating factor for transacting with each other. This type of governance structure is typical of recurrent and long exchanges among partners whose reciprocity and whose mutual adjustment coordinates the action of players. Price plays a minor role in the transaction in this governance structure compared to market or partly market based organization because sustaining the relationship is more critical.

In general, a multitude of governance structures could exist within any given system. These coordination mechanisms run through a continuum of low- to high- intensity coordination, including several hybrid combinations in between. Peterson et al (2001) gives good review of several other coordination strategies along a "make or buy" continuum.

6.3.1 The three trader types

This section presents a more thorough elaboration of the different trader types in Benguet vegetable markets. The different trader types -commissioners, wholesalers, and contractors - offer three different contract types operating under different governance structures. Table 6.2 gives an overview of the distribution of the three trader types from the survey.

Table 6.2 Trader types in Benguet vegetable markets, 2003

Trader Type	**Farmer survey**		**Trader survey**	
	Frequency	Percent (%)	Frequency	Percent (%)
Commissioners	260	58	100	51
Wholesalers	142	31	82	42
Contractors	48	11	13	7
Total	450	100%	195	100%

Source: Own survey

From Table 6.2 we can gather that commissioners are the most common trader type and the most frequently used governance structure by farmers. Wholesalers are used by a third of the farmers surveyed and are the second largest group among traders. Contractors are the smallest group among the trader survey and the least employed by farmers.

Commissioner-based transactions generally involve three players: Farmer, Commissioner and the commissioner's Buyer. Commissioners' buyers could be local or non-local wholesalers, *viajeros* (outbound truckers) or institutional buyers. In the thesis, we only consider the first two players, the farmer and the commissioner. Commissioner-based transactions begin in the trading post upon the farmers' arrival with the crops. Beforehand, the farmer has performed harvest and post-harvest operations such as hauling, sorting, cleaning, pre-market grading, packing and farm-to-market transportation. Commission agents approach farmers as farmers search for transacting partners in the trading post. Commissioners mediate by offering to look for buyers for the farmers' crops in exchange for a certain portion of the buying price for their efforts.

Farmers either search for commissioners or farmers are approached by commissioners who offer to help find buyers. According to the survey, the usual rate for hiring

commissioners is between 0.50 and 1 Philippine Peso per kilo of vegetable traded[21]. The commissioner searches for buyers and goes back to the farmer to report the buying offers received. If the farmer is not satisfied with it, the commissioner has to search for other offers which are satisfactory to the farmer. In this searching and negotiating process, farmers obtain market accurate "real-time" information from commissioners. After the vegetables have been sold to the final buyer through the commissioner, whether money will exchange hands is still uncertain. If money was paid immediately to the commissioner or farmer, then the contract between commissioner and farmer is finished. However, if money was not handed out, the farmer needs to monitor the commissioner until the payment is received.

To sum up, farmer-commissioner governance structures can be characterized by motivations of trade facilitation and the provision of market information. Prices are the main coordinating mechanism that dictates the actions of farmers and commissioners.

Wholesaler-based transactions involve two players: Farmers and wholesalers. The wholesalers, local or non-local, are the farmers' end buyers. Downstream, wholesalers sell vegetables to retailers, institutional buyers or *viajeros*. The Farmer-Wholesaler arrangement is similar to that of the commissioners in that transacting parties meet up at the trading post. In here, the buying price received by the farmers from the wholesalers is without commission cuts. The pricing system of wholesalers – one that *to some extent* depends on current market prices- is almost similar as commissioners. The shortening of the distribution channels by having a direct buying-link between farmers and wholesalers implies that less negotiation and bargaining within the link is involved. When disagreements occur, farmers and wholesalers can directly re-negotiate with each other. The wholesalers' ability to purchase is restricted by the spatial capacity of their rented stalls within the trading posts or the capacity of the trucks that will transport the crops.

Local wholesalers could also work under non-local wholesalers, or they (the local wholesalers) are Manila-based. They are generally well funded; and for this reason, can provide farmers with the needed agricultural credit and means of production such as seeds, fertilizers, or chemicals for pest and disease control. Wholesalers' assistance however, does not come without consequence. Later, farmers need to pay off the loans (at usurious rates) or prioritize their wholesaler-financier when crops are ready to be sold. They are forced into a *suki* agreement that refers to a kind of *locked-in* effect.

In sum, farmer-wholesaler governance can be characterized by motivations of presence of transaction safeguards such as provision of credit and means of production, direct farmer-wholesaler link, and the assurance to get money back. The identities of transacting parties are relevant and price is still a coordinating mechanism although transaction safeguards are as important.

Contractor-based transactions involve two players: Farmers and Contractors. Contractors' buyers are institutional buyers, *viajeros* (truckers) and sometimes, local- or non-local wholesalers. Contractors buy the products from farmers and transfer

[21] Note: Average 2003 exchange rate is 54.20 Pesos: 1 US$: 0.83 Euros

ownership rights to them at the farm level. Afterwards, the contractor re-sells the vegetables to downstream buyers. The transfer of property rights from farmers to contractors over the vegetables at the farm level implies that using this governance structure involves a distribution of risk in the transaction. The risk of the price (fluctuations), the harvest (perishability), and transport (losses) are taken over by the contractor from the farmer at harvest.

Farmer-contractor arrangement begins with the contractor offering a buying price for the whole harvest after a favourable visual inspection of the harvestable vegetables. When a deal is made, harvest and marketing details are planned mutually. This includes estimates for vegetable tonnage and price per kilo, harvest date and labour requirements. The contractor manages all harvest and post-harvest operations, payments for labour and including farm-to-market transfer. Payment is delivered to farmers, either immediately after hauling vegetables to trucks or after vegetables were sold. At any rate, the payment is immediate. This is because contractors have regular buyers or have "order quotas" to fulfil.

In general, farmer-contractor governance are characterized by motivations of the importance of good relations with each other particularly, often use of mutual adjustment as a coordination mechanism and relationship building. Other motivating factors behind the relationship are the assurance of a buyer and immediate payment. Most importantly, the risk re-distribution from the farmer to the contractor plays an important role especially in the marketing of high value crops.

6.4 Framework for Analysis: Transaction attributes and Transaction Costs

Ronald Coase (1937) argued that there is a cost in using the market and these hidden costs arise from the nature of the transaction and manner (governance) in which the transaction was organized. His observations resulted in the evolution of Transaction Cost Economics (TCE) which attempts to explain the governance structure under which transactions are performed (Douma and Schreuder, 1998: 147). The ***focus*** of TCE is to find a manner of organizing transactions in such a way that transaction costs are minimized. The ***approach*** of TCE is to regard transactions themselves as the basic unit of analysis. These are the principles behind the framework that is followed in this chapter. In order to determine the transaction-cost-minimizing governance structure, we first need to lay out **human-agent assumptions** that lead to transaction costs. Next, transactions are characterized according to their critical attributes: **transaction attributes** made up of asset specificity, frequency and uncertainty. Both human characteristics and critical attributes of transactions determine transaction costs; and by that, the governance structure best suited for the exchange.

6.4.1 Behavioural Assumptions: Bounded rationality and opportunistic behaviour

Human or behavioural uncertainty in the form of bounded rationality and opportunism can stem from either transacting party (Douma and Schreuder, 1998: 126). Slangen (2005:13) refers to bounded rationality as the fact that "*individuals have only limited possibilities and abilities to obtain and process information*". It refers to the inability of players to foresee all the things that might occur and affect the transaction. This human limitation makes it difficult to create contracts that would include contingencies for all forthcoming events. In a business relation, not everything is

calculable and can be written into the contract. Thus players tend to act in a rational manner based on what they know and within the limits of what they can foresee. Bounded rationality creates a highly uncertain environment for farmers and traders in Benguet to set definite transaction parameters. These uncertainties make contracts [between the two] more complex and increase the costs of organization (Masten, 2000: 181). Transactions conducted in uncertain environments should be under governance structures that can adapt to new circumstances (Verhaegen and van Huylenbroeck, 1999: 4).

Opportunistic behaviour was referred to by Williamson (1987: 30) as a condition of "*self interest seeking with guile*" that include deliberate efforts of either party to deceive and confound the transacting partner in order to gain more benefits from the transaction. Opportunistic behaviour can be categorized into two*: ex ante (*before reaching an agreement*)* and *ex post (*after reaching an agreement*)*. Transaction frequency is inversely related to behavioural uncertainty in the sense that, the more frequent a transaction is, the more the transacting partners become familiar with each other, resulting in less behavioural uncertainty. On the other hand, behavioural uncertainty is positively correlated with high asset specificities in the sense that, highly specific assets require more intensive monitoring of the actions of transacting partner (Verhaegen and van Huylenbroeck, 2002: 23).

6.4.2 Transaction Attributes: Asset specificity, Frequency, and Uncertainty

Williamson identified three critical elements that are used to characterize a transaction namely; asset specificity, frequency of occurrence, and degree and type of uncertainty (1989: 142). The most critical attribute of transactions is **asset specificity (**Williamson, 1975; Klein *et al.*, 1978; Williamson, 1979; Grossmann and Hart, 1986). Asset specificity refers to the opportunity costs that assets have for alternative use (Vernimmen *et al.*, 2000: 330). Williamson (1996: 59) describes asset specificity as "*the degree to which an asset can be redeployed to alternative uses and by alternative users without sacrifice of productive value*". Thus, the more specific an asset is for a special use, the less is its transferability for an alternative use and the higher is the opportunity for hold-up to occur. Hold up occurs when the bargaining and negotiating power of one party deteriorates as a result of previous investments specific to the transaction (Verhaegen and van Huylenbroeck, 2002: 17). In short, the investing party becomes more vulnerable to opportunism from the other party. Following Masten (2000: 180), there are five distinctions of asset specificity:

1. Site specificity – refers to the *special location* of the asset relative to other factors influencing the transaction.
2. Physical specificity – refers to the employment of *specialized equipment* required in the transaction.
3. Human specificity – arises from acquiring the knowledge to perform the job through education or by doing the activity frequently. Therefore, a transaction involving highly skilled labour is more human asset specific than a transaction that involves less skilled persons.
4. Temporal specificity – refers to the product's value as constrained by time. Due to the perishable nature of agricultural crops, vegetable exchange has always been temporal specific, whatever the governance structure that governs it. Not only are

agricultural activities constrained by time, selling activities must be done in time in order to capture the highest profits possible.
5. Dedicated assets – refers to discrete investments at the behest of a customer when the funds could have been used elsewhere.

Williamson identified a last type of asset specificity that is, brand name capital (1989: 143). However, in Benguet, production and marketing follows a traditional path, meaning, crops are sold in wet markets without brand name. Hence brand specificity shall not be discussed here. Asset specificity attributes that can be used to analyze the Benguet vegetable marketing system are site specificity, physical asset specificity, human capital specificity, temporal asset specificity.

Frequency of occurrence refers to the number of times a transaction takes place. Some transactions happen occasionally while others are repeated more often. In each transaction, one expects a unique kind of business relationship between buyer and seller. Infrequent transactions require only general form contracts while more specific contract agreements are employed for transactions that occur often. Contracts with intensive control are needed for more frequent transactions between two parties in order to, among others, reduce risk, avoid opportunistic behaviour and prevent hold up.

The **Uncertainty** of the transaction itself can stem from two sources (Rindfleisch and Heide, 1997: 31; Verhaegen and van Huylenbroeck, 2002: 23)

1. Exogenous to the transaction- meaning environmental uncertainty. Environmental uncertainty could take two forms: *first*, uncertainty in the institutional environment (changes in market policies, practices and regulations) or *second*, uncertainty in the market environment (variation in demand, changes in price of complementary and substitute products)

2. Endogenous to the transaction–meaning behavioural uncertainty, which could be the difficulty to calculate or supervise the behaviour of transaction party. Endogenous uncertainty comes in the form of actions of key market players that affect how transactions are conducted.

6.5 Transaction attributes and transaction costs in Benguet vegetable marketing

6.5.1 Characterizing Transaction attributes

A strong criticism against transaction cost literature is that its theoretical development failed to include the development of standardized measurement methodologies for transaction costs (cf. Escobal, 2005: 100). As such, the thesis used directly observable attributes to describe and estimate the transaction costs.

This section presents empirical results of the survey and connects results with theoretical discussions earlier in this chapter. We begin by presenting survey results reflecting a particular transaction attribute from the governance structure. In the survey, respondents were asked specific questions that relate to transaction attributes and transaction costs. Transaction costs are difficult to measure, and for that reason, in the table, we present items that are most closely approximating the attribute being

captured. Several transaction attributes of governance structures, due to difficulties of measurement were not included in the Table 6.3 but rather, were discussed thoroughly in the subsequent sections.

In Table 6.3 are transaction attributes as reported by farmers and traders in their respective surveys. On the left most column are transaction attributes, on the 2nd and 3rd columns are the results for farmers and traders, categorized by governance structure type. In transaction cost analysis, the transaction itself is the basic unit of analysis. For this reason, in the 4th column, we took total survey results from farmers and traders to determine the overall importance of transaction attributes of each governance structure as described by both transacting parties. The ranking or strength in the last column follows Williamson's (1991) model where +, ++ and +++ indicate low, moderate and high transaction cost *strength*, relative to the other governance modes. To determine the final strength of the transaction attributes we will use a combination of measurable attributes from the table and subsequent discussion of other transaction attributes.

Table 6.3 Transaction attributes by type of governance structure, Benguet 2003

Transaction attribute	Farmers	Traders	Total (Farmers + Traders)	As percentage of total respondents in the governance structure	Relative ranking /Strength
Physical asset					
Owns vehicle primarily for vegetable transport					
Commissioners	80	6	86	24%	++
Wholesalers	8	3	11	5%	+
Contractors	14	2	16	26%	+++
Invested in packing materials for vegetables					
Commissioners	0	3	3	<1%	+
Wholesalers	0	73	73	33%	++
Contractors	6	49	55	90%	+++
Invested in vegetable storage (space rent)					
Commissioners	0	3	3	<1%	+
Wholesalers	0	37	37	17%	++
Contractors	6	27	33	54%	+++
Human asset					
Average years in farming or trading					
Commissioners	15 (yrs)	8 (yrs)	23 (yrs)	-	++
Wholesalers	16 (yrs)	8 (yrs)	24 (yrs)	-	+++
Contractors	14 (yrs)	7 (yrs)	21 (yrs)	-	+
Uncertainty (Endogenous)					
Received or gave delayed payment					
Commissioners	135	47	182	51%	+++
Wholesalers	95	2	97	43%	++
Contractors	12	3	15	25%	+
Agreed that trading partner withholds critical					

transaction-related info					
Commissioners	145	45	190	53%	++
Wholesalers	85	17	102	46%	+
Contractors	30	7	37	61%	+++

Note: In farmer survey: 260, 142 and 48 farmers traded with commissioners, wholesalers and contractors respectively. In trader survey, there were 100, 82 and 13 commissioners, wholesalers and contractors respectively. This makes a total of 360 respondents in a commissioner-based, 224 in a wholesaler-based and 61 in a contractor-based governance structure.
Source: own survey

Transaction attributes of commissioner-based governance

We term marketing arrangements between farmers and commissioners as commissioner-based transactions. From the survey, there were a total of 360 respondents involved in commissioner-based transactions: 260 farmers in the farmer survey and 100 interviewed commissioners. As mentioned earlier, there are several attributes of transactions of governance structures that were only observable but not measurable. These non-measurable attributes were not included in Table 6.3. One of these observable elements is site specificity which we discuss here.

Transactions conducted with commissioner governance exhibit moderate site specificity. By this we mean that farmers invest in vegetable production in their farms in their municipalities; however, that is also where they reside. Conversely, transactions for this governance mode only occur within the vegetable trading centres because farmers using commissioners transport the harvests to the trading posts. Hence, geographical asset specificity is moderate for this transaction to occur, because production is a consequence of farmers' particular habitation while marketing through commissioners is contingent of the physical market's location.

We approach physical asset measurement by looking at investments in vehicles, packing materials and storage. In Table 6.3, a total of 80 of the 260 farmers who traded with commissioners owned the vehicles that were used to transport crops to the trading posts. Only six of the 100 commissioners interviewed owned vehicles for marketing purposes. This means that only 24% of the 360 respondents involved in commissioner-governance owned vehicles specific to the transaction. The governance structure scored lowest in terms of investments in packing materials and storage. Putting physical asset investment strength together, this means that the governance structure incurs low physical asset investments relative to the other two modes of organization.

In the same table, we approach human asset specificity by the average years involved in farming and trading. In this regard, commissioner-based governance structure incurred moderate human asset specificity. Farmers who dealt with commissioners have an average of 15 years of farming while the commissioners we interviewed incurred an average of eight years. This makes 23 years average farming and trading experience altogether for this governance structure. We assume that those involved in this market-based governance need experience in order to be able to accurately predict how prices will behave. Experience in accurate price prediction is necessary to hedge against fluctuating prices because the transaction is market-dependent.

Temporal asset specificity is not mentioned in Table 6.3 but to assess it, we look at the physical assets invested by both parties in the transaction and check if the invested asset has an effect on the timing of delivery and the vegetables' value. Looking at investments in vehicles, packing materials and storage, we argue that temporal specificity for this mode of organization is low relative to other governance structure types.

Frequency of transaction occurrence between commissioners and farmers is low because parties can exchange governance structures after the transaction.

We approach uncertainty measurement from an endogenous and exogenous point-of-view. Exogenous uncertainty is not measured in Table 6.3 but is observable. Exogenous uncertainty for commissioner-based transactions is strong for the farmer because the transaction depends on market prices which are known to fluctuate rapidly. When demand varies, farmer-commissioner transactions are the first to be affected. Moreover, transacting partners have little control over the transaction, because the relationship is price-motivated and therefore, prone to be influenced by market disturbances. Endogenous uncertainty is measured in Table 6.3 in terms of whether the farmers received delayed payments from traders or if the traders gave delayed payments to farmers. Endogenous uncertainty is high for this governance structure, as shown in the Table 6.3 and the summary in Table 6.4. More than half of the respondents who use the governance structure have experience giving or receiving delayed payments. When the contract is market-based, prices easily fluctuate and many are uninformed about prices, it is very easy for both sides to take advantage of the situation to increase profits. Opportunistic behaviour in terms of delayed payments to reflect fluctuated prices is common in this governance structure. Therefore, it is not surprising that Table 6.3 also shows that in this governance structure, the belief that the other trading partner withholds critical transaction related information is moderate compared to other arrangements. In sum, commissioner-based governance incurs high total uncertainty.

Attributes of transactions of commissioner-based governance is characterised by moderate site specificity, low physical asset specificity, moderate human asset specificity, low temporal asset specificity, low (occasional) frequency, and high uncertainty.

Transaction attributes of wholesaler-based governance

Marketing arrangements between farmers and wholesalers are called wholesaler-based transactions. From the survey, there were a total of 224 respondents involved in wholesaler-based transactions: 142 farmers in the farmer survey transacted with wholesalers and there were 82 interviewed wholesalers. We will approach transaction attribute analysis of wholesalers, similar to how we analysed commissioners. A combination of observable and measurable transaction characteristics will be used.

Transactions conducted with wholesalers exhibit moderate site specificity. Wholesalers own or rent warehouses or storage areas in and around the vegetable trading post. These investments represent immovable or sunk costs because it is difficult to transfer warehouse locations anymore once it is rented or bought. Similar

to commissioners, farmers invest in growing vegetables in remote municipalities but that is also their home.

Only five percent of the 224 respondents involved in wholesaler governance structure invested in vehicles for vegetable transport. This percentage is fewer compared to those who invested in vehicles that use commissioner-based governance structures. Relative to other governance structures, respondents in this arrangement invested moderate amounts in packing materials and in storage facilities. From Table 6.3, overall physical asset specificity is moderate for governance structures involving wholesalers.

Over-all human capital specificity of wholesaler arrangements is high relative to other governance modes. Farmers must be knowledgeable of proper harvesting, packing and transport techniques to maximize profits while wholesalers must be knowledgeable of grading, packing, storing, and transport technology.

To assess temporal asset specificity we look at the nature of physical assets invested. We argue that temporal asset specificity for this governance structure is moderate because of moderate total investments in vehicles, packing materials and vegetable storage.

Frequency of transaction occurrence between wholesalers and farmers is moderate (recurrent) because transactions within one season can be repeated between farmers and wholesalers. This event is more pronounced when the farmers occasionally obtain credit and means of production from the wholesaler. However, it doesn't mean that growers and wholesalers will trade with each other exclusively. Within one season and for the next season, farmers can also transact with other trader types.

Exogenous uncertainty for wholesaler-based transactions was observable but not measurable. We argue that this uncertainty is moderate because the *buying process* of farmers' vegetables not only depends on transaction negotiations between wholesalers and farmers but also depends on the *priority* and *practice* of wholesalers and the availability of *space* in the warehouses. Several wholesalers have favoured farmers (*suki*) whom they prioritize for transactions. This informal marketing norm that is prevalent in La Trinidad and Baguio city markets was discussed in Chapter 4. Endogenous uncertainty of this governance structure in terms of delayed payment is moderate as shown in Table 6.3. We must remember that wholesaler-governance is partly market based, and is thus, to some extent, affected by price fluctuations. Moreover, even though farmers who are into credit agreements with wholesalers are sure that wholesalers will buy their harvests, farmers are uncertain about the buying prices they will receive. This governance structure indicated the lowest uncertainty in terms of withholding critical-transaction related information. In sum, total uncertainty for this governance structure is moderate.

Attributes of transactions of wholesaler-based governance is characterised by moderate site specificity, moderate physical asset specificity, high human asset specificity, moderate temporal asset specificity, moderate (recurrent) frequency, and moderate uncertainty.

Transaction attributes of contractor-based governance

Marketing arrangements between farmers and contractors are called contractor-based transactions. From the survey, there were a total of 61 respondents involved in contractor-based transactions: 48 farmers in the farmer survey transacted with contractors and there were 13 interviewed contractors. We will approach transaction attribute analysis of contractors, similar to how we analysed commissioners and wholesalers. We shall use a combination of observable and measurable transaction characteristics.

Transactions conducted with contractors exhibit high site specificity. For the transaction to occur, contractors must invest time, money and effort to visit farmers in their municipalities. This is on order to conduct ocular inspection as well as negotiate buying prices with farmers.

Contractor-based governance incurred high physical asset specificity. Survey results in Table 6.3 showed that compared to the other marketing arrangements, this governance structure obtained the highest investments in measurable elements. A total of 26% of those involved in this mode of organization invested transportation, 90% in packing materials and 54% in storage. The trucks are difficult to redeploy for other purposes because they are structurally designed to handle vegetable transport.

Relative to the other governance structures, human capital specificity is moderate for people involved in this governance structure. We assume that the friendship or acquaintance of farmer and contractors is invested in the relationship and not much focus is given on trading or farming experience. However, contractors must know the techniques for harvesting crops, grading, and how to properly pack and transport them, particularly when they are handling high value crops.

Temporal asset specificity for contractors is not measured in Table 6.3 but we can look at the physical assets invested by both parties to check if the invested asset has an effect on the timing of delivery and the vegetables' value. Looking at investments in vehicles, packing materials and storage, we argue that temporal specificity for this mode of organization is high relative to other governance structure types.

Unlike commissioners and wholesalers, frequency of transaction occurrence between contractors and farmers is high because the transacting parties meet often. Frequent communication between farmers and contractors does not only involve discussions about crops and prices but also about personal matters.

We measure uncertainty for the contractor governance structure from an endogenous and exogenous approach. Observable exogenous uncertainty for transactions conducted with contractors is low because despite fluctuating prices or over-production, farmers are assured by contractors that they will buy their crops. On the other hand, once contractors take over harvest and post harvest activities, they are now bearing the full risk of marketing the crop. When contractor buy high value products, the risk of profit loss on their side is even higher. Endogenous uncertainty is low for this mode of organization because farmers and traders need to trust each other about their crop valuation procedures and prices.

In Table 6.3, survey results show evidence that the contract-based governance had the least incidence of delayed payments (25%) among all governance structures. However, contrary to expectations, in this governance structure, we observed the highest incidence of respondents that suspect that the trading partner is withholding critical transaction-related information. We assume that farmers who are involved in this governance structure are cautious because they risk their whole season's harvests based on price approximations of contractors. When quoted prices do not always reflect *real time* market prices (less marketing and transport costs) farmers hesitate. On the contractors' side, they are assumed to reserve a bit of their expectations to the fact that farmers could lower farm management standards once a contract has been agreed upon. However, in sum, total transaction uncertainty is low for contractor-based governance.

Attributes of transactions of contractor-based governance is characterised by high site specificity, high physical asset specificity, moderate human asset specificity, high temporal asset specificity, high (recurrent) frequency, and low uncertainty.

Summarized in Table 6.4 are transaction attributes of the three governance structures. The basis of the assessments is on quantitative results from Table 6.3 and from market observations that were the basis of discussions in earlier sections. Applied in the table are the qualitative notations used by Williamson (1991: 281) to denote the strength of transaction attributes.

Table 6.4 Transaction attributes based on three major trader types, Benguet 2003

Transaction attribute	Transaction Types		
	Commissioner-based transactions	Wholesaler-based transactions	Contractor-based transactions
Type of governance structure used	Market based	Hybrid (Partly market, partly credit-based)	Hybrid (Partly-market, partly relation-based)
Asset specificity			
Site	++	++	+++
Physical asset	+	++	+++
Human capital	++	+++	++
Temporal asset	+	++	+++
Total Asset Specificity	***+ (Low)***	***++ (Moderate)***	***+++ (High)***
Frequency	***+ (Low)***	***++ (Moderate)***	***+++ (High)***
Uncertainty			
Exogenous	+++	++	+
Endogenous	+++	++	+
Total Uncertainty	***+++ (High)***	***++ (Moderate)***	***+ (Low)***

Notes: +++: high ++: moderate +: low

Attributes of transactions of commissioner-based governance are characterised by low asset specificities and low frequency. It incurred the highest total uncertainty relative to the other governance structures. Attributes of transactions of wholesaler-based organization exhibited moderate qualities in asset specificity, frequency and uncertainty. Contractor-based governance exhibited the highest asset specificity and frequency but the lowest uncertainty relative to other modes of organization.

6.5.2 Estimation of Transaction costs from transaction attributes

Governance structures that are used to sell crops differ with each other in terms of the manner in which the crops are traded. They incur transaction costs from their attributes of transactions: activities conducted within each organization mode. Generally, we can distinguish different types of transaction costs (Hobbs, 1995).

Search and information costs refer to the costs incurred in the process when traders and growers find each other and learn about the crop quality, quantity, price, terms of exchange and expectations for each transacting partner.

Negotiation and bargaining *costs* refer to the costs incurred in the conciliation of terms of vegetable exchange and discussions until a (perceived) advantage for each transacting party is reached. It involves discussions about the buying or selling price, repayment schedules and other important exchange-related topics.

Monitoring and enforcement *costs* refer to costs incurred when the transacting parties take measures to ensure that the agreement is realized as well as providing remedies in case of performance failure.

In this section, we focus on kinds of transaction costs incurred by each type of governance mode. Similar to the previous section, in Table 6.5 we first present survey results that pertain to a type of transaction cost. On the left most column are the transaction attributes that incurs specific types of transaction costs. Since transaction costs vary, assessment for each enumerated "cost" was through different methods; these are indicated on the table.

On the 2nd and 3rd columns are the results for farmers and traders, categorized by governance structure type. On the 4th column, we took total survey results from farmers and traders to determine the overall strength of transaction costs of each governance structure. Similar to Table 6.3, the ranking or strength in the last column follows Williamson's (1991) model where +, ++ and +++ indicate low, moderate and high transaction costs, relative to the other governance modes. Later, we present a simpler table summarizing survey results and transaction costs of each mode of organization. To determine the final relative strength of the transaction costs we will use a combination of measurable attributes from the table and discussion of non-measurable transaction costs.

Table 6.5 Transaction costs by type of governance structure, Benguet 2003

Transaction attribute	**Farmers**	**Traders**	**Total**	**As percentage of total respondents in the governance structure**	**Relative ranking /Strength for transaction**
Search and information					
Travels to market to know prices (yes replies)					
Commissioners	18	82	100	28%	+
Wholesalers	15	68	83	37%	+++
Contractors	11	8	19	31%	++

Average attempts to search for trading partner before transaction is made					
Commissioners	2	3	5	-	+
Wholesalers	2	3	5	-	++
Contractors	1	3	4	-	+++
Negotiation and bargaining					
Average time lapse in negotiation hours before transaction is made (including transaction itself)					
Commissioners	0.5 (hrs)	0.7 (hrs)	1.2 (hrs)	-	++
Wholesalers	0.2 (hrs)	0.3 (hrs)	0.5 (hrs)	-	+
Contractors	0.4 (hrs)	1.15 (hrs)	1.55 (hrs)	-	+++
Monitoring and enforcement					
Farmer accompanies trader in transactions (yes replies)					
Commissioners	178	81	259	72%	+++
Wholesalers	1	0	1	<1%	+
Contractors	2	1	3	5%	++
Others: Price setting					
Trader sets buying price (yes replies)					
Commissioners	219	62	281	78%	++
Wholesalers	125	51	176	79%	+++
Contractors	18	10	28	46%	+

Note: In farmer survey: 260, 142 and 48 farmers traded with commissioners, wholesalers and contractors respectively. In trader survey, there were 100, 82 and 13 commissioners, wholesalers and contractors respectively. This makes a total of 360 respondents in a commissioner-based, 224 in a wholesaler-based and 61 in a contractor-based governance structure.
Source: own survey

Search and information costs

Search information costs were measured by two items. The first indicator is whether the respondent travels voluntarily to the market in order to learn prices and the total number of attempts to search for a trading partner before a transaction is carried out. Table 6.5 shows 18 farmers and 82 traders involved in commissioner-based governance that travel to the market to purposely be informed about prices. This represents only 28% of the total respondents involved in commissioner-governance. Those involved in wholesaler organization travel most often to the market in search for price information.

In terms of costs in attempts to search for *the* trading partner, contractor-based governance incurred the relative highest number of attempts while commissioner-based governance entailed the lowest number of attempts. In contractor-based governance, trading partner identity is important and for that reason, it might involve more search time for the person they trust to transact with. In commissioner-based transactions, the attempts to find a trading partner are low because the search for commissioners does not take time. The partner identity is not important.

Negotiation and bargaining costs

Negotiation and bargaining costs was measured using the average time lapse in negotiation hours before an agreement is reached. Wholesaler-based governance incurred the least negotiation time of 1.2 hours average while contractors involved the longest negotiation time of 1.6 hours average. In section 6.3 we argued that wholesalers allow little room to bargain, particularly if the farmer is in a *locked-in* situation and is merely repaying his production loan through his harvest. Contractors incur longest negotiation time because the bargaining of a whole season's harvest involves a huge risk on the farmer side. Moreover, it is possible that in the negotiation, the farmer and trader include personal elements in the discussion in order to get to know the identity of the trading partner better.

Monitoring and enforcement costs

Monitoring and enforcement costs are measured by looking if farmers accompany traders in their transactions for the secondary buyers. We use this instrument to measure monitoring costs because it should be unnecessary for farmers to accompany their trading partners in their search for buyers. Monitoring costs not only measure transaction costs but also hint at two more attributes: the amount of trust farmers have towards their chosen trading partner and the nature of the way activities within the governance structure is conducted.

Among the different types of transaction costs that were enumerated in this section and used to characterise transactions, monitoring and enforcement costs bore a conspicuous difference among the three governance structures.

Commissioner-based governance exhibited highest monitoring costs, because we see that 78% of the farmers who are into this marketing arrangement accompany commissioners to look for secondary buyers. Only five percent of the farmers involved in contractor governance accompany contractors while less than 1 percent of the farmers involved in wholesaler governance accompany wholesalers in search for buyers.

We observe a big difference in the monitoring costs between commissioners and contractors. We assume that the difference can be attributed to the trust that exists between farmers and contractors. The difference in monitoring costs between commissioners and wholesaler governance can be attributed to two things: First, wholesalers have permanent stalls or warehouses for storing crops in the trading posts so it is easy for farmers to monitor their activities. Second, for farmers who are into credit arrangements, it is unnecessary to monitor the wholesaler. It is more important for the farmer that the wholesaler buys his harvests in order to pay off his credit (and get out of the *locked-in* situation) rather than to know if the vegetables are sold at the highest prices.

Shown in Table 6.6 is the summarization of transaction costs for each governance structure.

Table 6.6 Transaction cost estimation by type of governance structure, Benguet 2003

Transaction attribute	**Transaction Types**		
	Commissioner-based transactions	Wholesaler-based transactions	Contractor-based transactions
Search and information costs	+	++	++
Negotiation and bargaining costs	++	+	+++
Monitoring and enforcement costs	+++	+	++
Total transaction costs	++ (Moderate)	+ (Low)	+++ (High)

+++: high ++: moderate +: low

Table 6.6 shows that wholesaler-based transactions incurred the lowest transaction costs - based on these three attributes - among the three governance structures in Benguet vegetable markets. Contractor-based and commissioner-based governance incurred high and moderate total transaction costs respectively. Note that commissioner governance entailed the highest monitoring costs and contractor-based governance incurred highest negotiation costs. Within the wholesaler governance, negotiation and monitoring incurred the lowest costs. To sum up the results of Table 6.4 and Table 6.6, Table 6.7 is constructed below.

Table 6.7 Transaction attributes and transaction costs of governance structures in Benguet vegetable markets

Attribute	**Transaction Types**		
	Commissioner-based transactions	Wholesaler-based transactions	Contractor-based transactions
Total Asset Specificity	Low	Moderate	High
Frequency	Low	Moderate	High
Total Uncertainty	High	Moderate	Low
Total Transaction costs	Moderate	Low	High

Relative to the other governance structures, a commissioner-based transaction using market governance is characterized by low total asset specificities, low frequency but high total uncertainty. This governance structure incurs the highest monitoring and enforcement costs among the three governance modes, costs of which are mostly shouldered by growers. As mentioned, due to the perceived higher uncertainty involved in this arrangement (relative to the other modes), many farmers accompany commissioners in search for buyers. Overall transaction costs are moderate for commissioner-based organization compared to the alternative structures.

Relative to other governance structures, wholesaler based transactions using a partly-market; partly credit-based coordination (hybrid organization) is characterized by moderate total asset specificity, frequency and uncertainty. Credit tie-ups between farmers and wholesalers create a *locked-in* effect that balances out Uncertainty and Frequency while lowering transaction costs. Thus, in terms of transaction costs alone, this governance structures incurs lowest costs compared to alternative structures.

Relative to other modes of organization, contractor-based transactions using partly market, partly relation-based (hybrid) governance are characterized by high total asset specificity, high frequency and low uncertainty. This mode of governance incurs the highest negotiation and bargaining costs among the three governance modes. It is

assumed that longer communication involves discussions of personal nature, which consequently lowers transaction uncertainty as identities begin to matter. As a result of amity and at the same time, due to the activities involved within this governance structure, harvest and post harvest risk is accordingly reduced on the farmer's side. However, due to high asset specific investments and the recurrent nature of transactions, overall transaction costs are high with contractor-based governance relative to the alternative structures.

6.5.3 Efficient contracts and governance structures

Attributes of transactions help determine the best governance structure for farmers and traders for organizing exchange. This section develops a framework for determining the best governance structure in relation to transaction attributes and contract types. The approach was first based on the framework proposed by Douma and Schreuder (1998: 173). However, as Figure 6.1 illustrates, we developed a more specific framework incorporating the interaction of asset specificity, uncertainty and frequency.

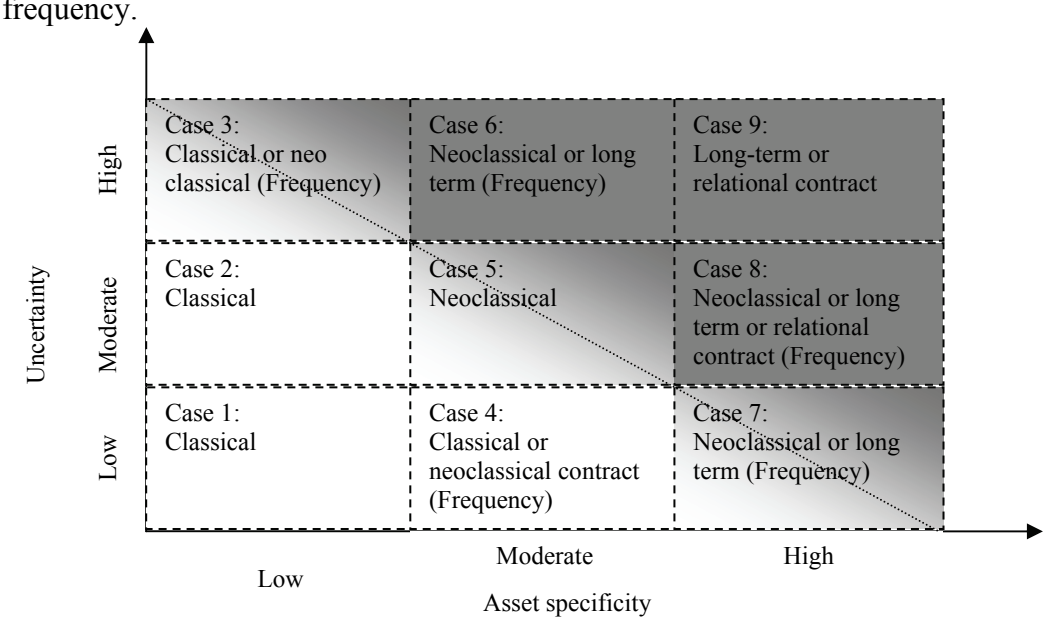

Figure 6.1 Distribution framework for efficient contractual arrangements

We use asset specificity in the $x-axis$ of the framework. We classified asset specificity as low, moderate or high in order to be consistent with categorizations from earlier results. Transaction attributes were measured from both sides of the transaction, meaning, for farmers and for traders. This means that asset specificity could either be low for both, high for both, or moderate for both. Uncertainty is measured on the $y-axis$ using the same classifications: low, high or moderate for both transacting parties. Frequency is taken into consideration depending on the situation. The result is a framework with nine possible contractual scenarios for different combinations of asset specificity, uncertainty and frequency.

Case 1 is a situation where asset specificity and uncertainty is low for both transacting partners. In this case the market is the best governance structure for coordinating transactions. The optimal contract type for market governance is classical contracts under market-based governance. When transaction uncertainty increases to moderate

but asset specificity is still low, then we have a situation of ***Case 2*** where classical contracts under market-based governance are still the optimal modes of organization. ***Case 3*** is a situation where asset specificity is low but uncertainty is high for both transacting partners. In this case, we must take transaction frequency into consideration. For occasional (low) transactions, classical contracting under market governance is the best alternative. For repeated (moderate and high) transactions neo-classical contract under hybrid governance is first best. The same decision is made in ***Case 4***, where asset specificity is moderate for both parties but transaction uncertainty is low. The invested assets warrant that for occasional transactions, a classical contract is enough but when transactions are repeated, it is best to create a neoclassical contract.

Case 5 is a mediocre state, where moderate asset specific investments are used in a semi-uncertain transaction atmosphere. The level of investments and uncertainty calls for a neoclassical contract within the governance structure. ***Case 6*** involves moderate asset specific investments in a highly uncertain transaction. At least a neoclassical contract is in order for occasional transactions while recurrent exchanges are better off with long term contracts. When asset specificity is high but uncertainty is low for both transacting partners as in ***Case 7***, creating neo-classical contracts that fall under hybrid modes of governance are the best for transactions that are occasional. Recurrent transactions require a long term or a relational contract in order to minimize transaction costs. ***Case 8*** is a situation where asset specificity is high for both parties while uncertainty is moderate for both. In this case, a neo-classical (for occasional transactions), long term or relational contract (for recurrent transactions) mitigates asset specific investments and uncertainty for both parties. The last case, ***Case 9*** involves a situation where we both have high asset specific investments and high uncertainty. A long term or relational contract is best for both transacting parties to protect their interests and reduce transaction costs. The grey shadow illustrates situations of increasing transacting coordination while the white areas in the figure represent less need for intensive control coordination mechanisms.

Where are the three governance structures in Benguet distributed in the framework? The results of aligning transaction attributes (from Table 6.7) to come up with contract types and governance structures in the most "transaction-cost-controlling manner" to organize vegetable exchange is shown in Figure 6.2.

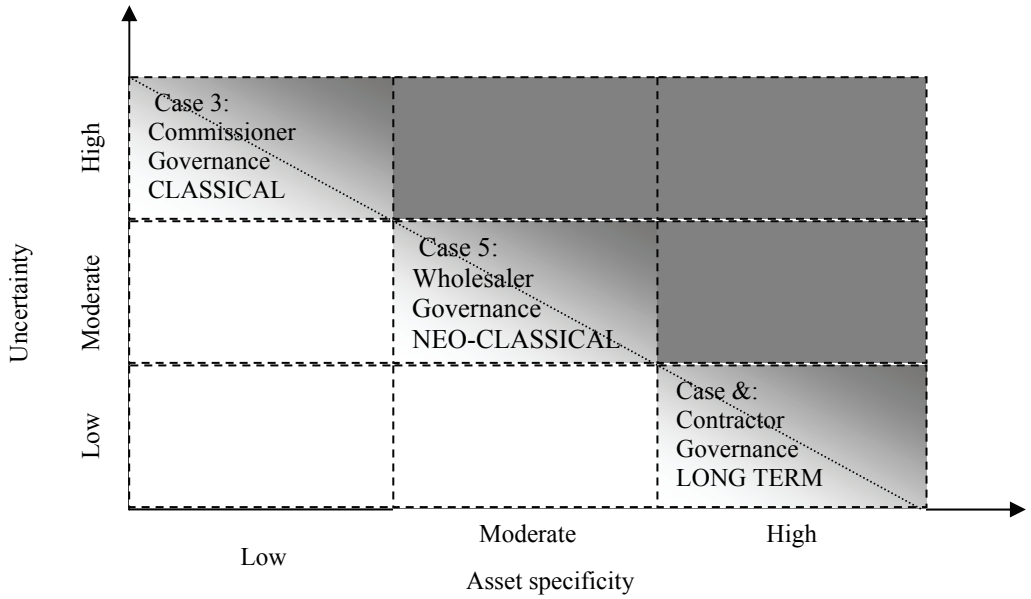

Figure 6.2 Efficient contractual solutions for Benguet vegetable marketing

Figure 6.2 shows the efficient contract type that would best support a governance structure based on transaction attributes of asset specificity, uncertainty and frequency. A commissioner-led governance structure where transaction attributes of total asset specificity is low, frequency is low and total uncertainty is high is best performed supported by a classical contract. The occasional transaction frequency as well as low investments from both parties does not merit more complicated contracts. Wholesaler governance with transaction characteristics of moderate asset specificity, uncertainty and frequency requires a neo-classical contract to provide a measure of protection for both parties through safeguards. For contractor governance that exhibits high asset specificities, recurrent frequency but low transaction uncertainty, a long term contract is the most optimal. Long term contracts involve a greater need to build a relationship based on mutual adjustment, partner identity and safeguards. Long term contracts are necessary to mitigate transaction costs, prevent hold-up and diminish opportunistic behaviour from one party.

In sum, the framework shows evidence that based on transaction attributes a classical contract where price is the main coordinating mechanism is optimal for commissioner-based governance structures. However, the nature of the market-based classical contracts mean that the identities of transacting parties are irrelevant and only prices motivate transactions. A trade-off between capturing high prices and transaction uncertainty is observed. Although the governance structure has evolved to function in an optimal manner given the institutional environment, it incurs the highest monitoring and enforcement costs among other alternatives, as participants' respond against possible opportunism.

A neoclassical contract where price and safeguards play equally important roles is best suited for wholesaler-based governance structures. In neoclassical contracts, identities of transacting parties begin to matter.

Based on transaction costs alone, the wholesaler governance structure is the one that minimizes transaction costs most, relative to the other two arrangements. However, a

trade-off exists within this organizational mode: that of minimized transaction costs and the locked-in effect. The framework shows that given the institutional environment, wholesaler governance is functioning optimally when using neoclassical contracts in a hybrid mechanism. It incurred the least total transaction costs among governance alternatives, due to the low negotiation and low monitoring costs. However, negotiation and monitoring costs could be low because of the locked-in effect: farmers have no alternative but to sell harvests to wholesalers in order to pay off their debts.

The framework shows that a long-term contract where identities of transacting parties and safeguards matter is optimal for contractor-based governance structures. Using relation-based contracts in order to create binding trading relations works best for this governance structure. It incurred high negotiation costs because the farmers' whole harvest is at stake. Moreover, negotiation within a relational contract involves communication and adjustment to each other's personal and business interests. Note that the search process for trustworthy contractors increases relative search/information costs but reduces relative monitoring costs later on.

Earlier we argued that routines within a system – routines for making decisions and carrying out tasks – evolved because they tend to economize on scarce resources (Milgrom and Roberts, 1992: 43). However, unless the routine was subjected to full analysis, it could mean that sometimes, the routine is not the best manner to conduct economic exchange. At first, the governance structures used in Benguet vegetable marketing and the activities involved within each, appears to be traditional and inefficient. However, we also have to consider the motives that drive farmers and traders and conditions in which exchange relations take shape. After full analysis we realised that given the institutional environment within the marketing system of Benguet, the three governance structures and the activities within each have evolved into optimal modes of organization, in terms of contract types used by market participants. The governance structures still incur transaction costs because optimal alignment does not fully eradicate transaction costs, but rather, it means functioning in the most transaction-cost-minimizing manner.

6.6 Summary and Conclusions

The chapter set out with the objective of analyzing governance structures based on attributes of transactions and their corresponding transaction costs. The three general contract types were discussed. Classical contracts are contracts where price is the main coordinating mechanism and where safeguards and identities of trading partner are irrelevant. In neoclassical contracts, safeguards and prices coordinate the actions of people involved while at the same time partner identity is beginning to take importance. In relational or long term contracts, the identities of trading parties are known and important. Mutual adjustment, safeguards and mutual interest in gains are crucial while price takes a less critical role in coordinating actions.

The three trader types in Benguet markets were introduced. A total of 645 respondents were interviewed, consisting of 450 farmers and 195 traders. A total of 360 respondents were involved in commissioner-based governance, 224 respondents in wholesaler-based governance and 61 respondents in contractor-based governance. Commissioners primarily act as a mediator between farmers and buyers. In the

process of searching for buyers of farmers' harvests, commissioners provide price information. Wholesalers are the farmers' final buyers and also serve as main sources of informal credit for production purposes. Contractors are also final buyers who buy crops before they are harvested.

An evaluation of transaction attributes of each organizational mode shows that commissioner-based governance exhibits low asset specificity, low transaction frequency and high uncertainty. It incurs semi-high transaction costs overall compared to the other governance structures. Wholesaler-based governance exhibits moderate asset specificity, frequency and uncertainty. Total transaction costs are low because of the trade-off with the *locked-in* effect. Transactions in a contractor based governance exhibit high asset specificity and high frequency but low uncertainty. It incurs high transaction costs relative to commissioner- and wholesaler based-governance.

A framework that determines the efficient alignment of contracts to governance structures based on transaction attributes was developed. The framework consisted of nine cases of optimal alignments from possible combinations of asset specificity, uncertainty and frequency. Applying previous transaction attribute analysis results to the framework, we showed that based on transaction attributes of the commissioner governance, it is best conducted using classical market-based contracts. Wholesaler and contractor governance are optimally conducted using neoclassical and long term contracts, respectively.

Theory states that whatever the resulting optimal governance structure for a transaction, it must be one that minimizes most on transaction costs. The historical evolution of governance structures in Benguet vegetable markets resulted in the optimal alignment of governance structures with contracts. This means, given the institutional environment, the three governance structures are optimally aligned with the contract types they support and are therefore already in a transaction cost reducing state.

However, recalling the objective of determining the governance structure that minimizes most on transaction costs, among the commissioner, wholesaler and contractor coordination mechanisms, wholesaler governance is the most optimal because it incurs the least transaction costs compared to alternatives. Note that this result comes only from the point of view of transaction cost analysis. The lowered transaction costs stem from low negotiation and low monitoring costs. However, if we also consider the conditions in which exchange relations take shape, then the reason behind these low costs is because farmers are caught in a *locked-in* effect due to credit agreements. Their lack of means of production and the lack of well developed credit system in the country drives them to acquire loans from traders with the promise of selling the harvest as repayment. At the time of exchange, their previous credit position reduced farmers' bargaining capacity and eliminates the need to monitor the transacting partner. Therefore, the trade-off that is observed in the wholesaler-governance is that, it is optimal because it incurs the least transaction costs. However, it incurs least transaction costs because farmers are in *locked-in* situations due to credit agreements with wholesalers.

Chapter 7: The role of farm and farmer characteristics in the choice of governance structures

7.1 Introduction

At least twice a year during the production season, Benguet farmers have an opportunity to decide to change the manner by which they want to sell their crops. The farmer needs to choose who among the numerous intermediaries in the vegetable trading post he prefers to trade with. Since most middlemen have overlapping functions, eventually, the choice boils down to three trading partners that offer different modes of governance: commissioners, contractors and wholesalers (Dagupen and Ramos, 1997; Sim, 1997; Rola, 1999; Pulami and Dagupen, 2002).

For the grower, decision-making is not always easy. In the choice process, several factors which vary in relative importance -depending on the farmer's objectives - are weighed. In Chapter 6 we pointed out that the farmer's reasons for selecting governance structures may not always be income-related. It is possible that farmers select governance structures for reasons of debt repayment, risk reduction or maintaining good relations.

For the researcher, farm-level decision-making is not always easy to understand. When studying decision-making, Ali (2005: 57) argues that among other things, household strategies, embeddedness in opportunity structures and the individual's moral motivations need to be considered in order to comprehend the decision-making process. The three dimensions that the authors mentioned overlap, in one way or another, with the social capital of the decision-maker.

Social capital and its influence on decision-making are interpreted by many studies in terms of collective action (Magno, 2001; Grootaert, 2002). Grootaert and Bastelaer (2002: 8) maintain that when attitudes of mutual trust within local networks exist, collective action is easier to implement. Now, farmer decision-making is not a communal activity. Nevertheless, several studies allude to the effect of social capital (or the lack of it) on the way individual decisions are made. Earlier the study of Batt (Batt, 2001: 16) on Benguet potato farmers and their seed suppliers was discussed. His research showed that despite recurring exchanges, there existed no correlation between trust and the duration of farmer-trader relationship. He discovered that as farmers buy potato seed supplies from preferred sellers, they concurrently consider other suppliers. The conclusion was that farmers' allegiance to a relationship is correlated to their contentment with the trader's performance rather than on trust. On the basis of the farmer's perception of trust and the strength of his informal networks, the farmer can have a preference for a certain trading partner and therefore is predisposed to transact with him. Gladwin and Murtaugh (1980) proposed that the "unconscious" decision can later be re-assessed or revised by the farmer's conscious mode. They argue that not only the decision-maker's characteristics but also his subconscious has an influence on the choice made. In Chapter 4 and 5, subconscious decision-making by farmers was substantiated by discussions on the preferred-buyer system. The preferred-buyer or "*suki"* arrangement in provincial vegetable trade implies that informal rules and traditions have an effect on local marketing practices.

For this reason, in this chapter, the analysis will focus on testing empirically whether varying levels of social capital make a difference to the way farmers select governance structures. On the basis of social capital, we therefore examine which farm and farmer characteristics, among others, are considered by the farmer in his selection of governance structures.

7.2 Objectives of the chapter

This chapter aims to identify and explain farmers' choice among various governance alternatives for selling vegetables. The specific objectives are as follows:

1. Determine and analyze factors explaining farmers' decisions to use a specific governance structure over an alternative

2. Examine whether social capital plays a role in farmers' choices of governance structures

The rest of the chapter is structured as follows. Section 7.3 develops the theoretical and empirical model of governance structure choice. The data used for estimation is discussed in 7.4. In section 7.5, the estimation results and their marginal effects are presented. The chapter ends with conclusions in section 7.6

7.3 Theoretical and empirical model of governance structure choice

A choice model based on the random utility model is presented. The model reflects a farmer's decision to select among governance structure alternatives[22]. We assume that a farmer's decision is generated based on his utility maximization. Farmer i ($i = 1, 2,..., N$) evaluates each governance alternative j ($j = 0, 1,..., J$) . Then, the farmer compares his utility from each governance alternative U_j ($U_0, U_1 ... U_J$) and chooses the one that maximizes his utility (Hensher *et al.*, 2005: 82). The indirect utility function for the *i-th* farmer for the *j-th* alternative is thus:

$$U_{ij} = x_i' \beta_j + e_{ij} \qquad (i = 1, 2,..., N;\ j = 0, 1,..., J) \qquad (1)$$

Where x_i denotes a vector of exogenous socio-economic farmer characteristics and other variables, β_j represents the vector of coefficients associated with the jth category and ε_{ij} is a stochastic disturbance.

To depict farmers' choice of governance structures empirically, we use the multinomial logit model. The probability that farmer i selects governance structure j is equal to the probability that alternative j maximizes his utility after evaluating each and every alternative in the choice set $j = 0, 1,..., J$. In notation,

[22] The approach has been used to analyze institutional choices, for example, Boger, 2001 and Hatirli *et al.*, 2004

$$\Pr ob\,(y_i = j) = \Pr ob\,(U_{ij} > U_{ik}) = \frac{e^{x_i\beta_j}}{\sum_{k=0}^{J} e^{x_i\beta_k}}$$

for $j = 0, 1, ..., J$ (2)

where Y represents the total choice set of governance structures. It is assumed that U_{ij} is maximum among $J+1$ choices. Based on the survey, governance structures were mutually exclusive meaning, a farmer was not transacting with more than one trader for the same harvest at the same time. The reference choice "commissioners" was chosen as the base group. Therefore vector β_j is obtained only for contractors and wholesalers. Hence, Equation 3 will now be:

$$P(y_i = j) = \frac{e^{x_i\beta_j}}{1 + \sum_{k=1}^{J} e^{x_i\beta_k}}, \qquad \text{for } j = 0, 1, ..., J \qquad (3)$$

and,

$$P(y_i = 0) = \frac{1}{1 + \sum_{k=1}^{J} e^{x_i\beta_k}}$$

Equations 2 and 3 represents a choice model known as the multinomial logit model whose probabilities defined in equations 2 and 3 must sum to 1. Therefore the model needs to be normalized such that the parameters $\beta_0 = 0$ for the base group. The J log-odds ratios can be computed as: $\ln[P_{ij}/P_{io}] = x_i\beta_j$ and $\ln[P_{ij}/P_{ik}] = x_i(\beta_j - \beta_k)$ in order to predict the relative probability of farmer i choosing a governance structure over another. Because the coefficients' meanings are not always straightforward, marginal effects are computed from parameter estimates to give better explanation of results (Greene 2003: 722). The equation for computing the marginal effects is as follows:

$$\frac{\partial P_j}{\partial x_i} = P_j\left(\beta_j - \sum_{k=1}^{J} P_k\beta_k\right) \text{ for } j = 0, 1, 2, ..., J \qquad (4)$$

In our case, $J = 2$, and the alternatives $j = 0, 1, 2$ represent commissioner, wholesaler and contractor, which correspond to market-based, partly-market, partly-credit based (hybrid) and partly-market, partly relation (hybrid) governance structures, respectively.

7.4 Data and expectations

7.4.1 Data

Data used for this analysis came from a survey of indigenous farmers from seven municipalities of Benguet. The data consists of 450 farmers who traded exclusively with commissioners (260), contractors (48) and wholesalers (142) at the time of the

survey. Farmer, farm, and transaction characteristics, social capital and market-related farmer perceptions were collected from the respondents.

In our initial approach farm, farmer characteristics and all social capital statements[23] were entered as explanatory variables in a conventional multinomial logit model using data from all respondents. The preliminary tests offered significant results. However we wanted to investigate if we could distinguish farmers' decision-making based on their inherent social capital. Specifically, we wanted to know if farmers with low social capital chose governance structures differently from farmers with high social capital. For this reason, it was decided to find clusters of homogeneous farmers within the data set based on their measurable social capital statements. First, hierarchical cluster analysis using average linkage within groups was conducted. In *average-linkage* clustering, the distance between one cluster *x* and another cluster *y* is considered to be the mean of all-pair wise distances between items contained in *x* and *y* (Field, 2000: 423).

Initially, there were three clusters formed that were comprised of one big group and two smaller groups. Because the two smaller clusters partitioned early at cluster distance 4, arbitrarily increasing the grouping threshold to a cluster distance of 12 resulted in the merging of the two small groups into one. This resulted in two farmers' clusters and a more balanced distribution of items between the two groups. The decision to merge the two smaller groups was also done in order to avoid severe degrees-of-freedom problems for the choice of contractors later on.

Then, using the stricter K-means cluster analysis, specifying for two groups, two final farmer clusters were formed. Group 1 was formed having 230 farmers with low social capital and Group 2 having 220 farmers with higher social capital. Shown in Table 7.1 are the descriptive statistics for farmers in the two clusters.

Table 7.1 Descriptive statistics of farmers with Low and High Social Capital

Variable	Low Social Capital group, n= 230 observations				High Social Capital group n= 220 observations			
	Mean [a]	Std. Dev	Min	Max	Mean [b]	Std. Dev	Min	Max
Farmer's characteristics								
Farmer's gender (0= female, 1=male)	0.69	0.46	0	1	0.69	0.89	0	1
Age (years)	40.22	9.47	18	70	41.53	11.39	20	79
Years farming	14.82	8.75	1	40	15.59	9.48	1	50
Number of people in the household	6	2.33	1	13	5.8	2.56	1	20
Final education, the farmer's finished education level, (0=primary, 1=secondary, 2=tertiary)	0.91	0.65	0	2	0.99	0.70	0	2
Ibaloi ethnicity, dummy for Ibaloi ethnicity, (0= if the farmer is not Ibaloi, 1= if farmer is Ibaloi)	0.33	0.47	0	1	0.30	0.46	0	1
Kankanaey ethnicity, dummy for Kankanaey ethnicity, (0= if the farmer is not	0.59	0.49	0	1	0.61	0.49	0	1

[23] We removed the two statements on poverty perception because the statements exhibited high collinearity with each other.

Kankanaey, 1= if farmer is Kankanaey)								
Land ownership, (0 if farmer does not own the land, 1 if otherwise)	0.69**	0.46	0	1	0.81**	0.39	0	1
Vehicle ownership for vegetable transport (0=no, 1=yes)	0.19*	0.39			0.26*	0.44	0	1
Other sources of income, off-farm (0=no, 1=yes)	0.14**	0.35	0	1	0.24**	0.43	0	1
Farmer's need for credit for production purposes (0=no, 1=yes)	0.54***	0.50	0	1	0.35***	0.48	0	1
Farmer's farm income for the season under survey (in Philippine pesos)	-71.25[a]	17970.53	-105000	82500	2013.24[b]	16702.74	-68000	58200
Farm characteristics								
Farm size (in Ares)[24]	49.71**	63.99	1	500	66.45**	70.82	3	500
Hours away, farm to vegetable trading post distance measured in hours of travel time	2.82**	1.70	0.08	6	3.14**	1.72	0.08	7
Transaction Characteristics								
Farmer's experience of conflict (0=no, 1= yes)	0.33***	0.47	0	1	0.58***	0.49	0	1
Farmer's experience of delayed payment (0=no, 1= yes)	0.50*	0.50	0	1	0.58*	0.49	0	1
Farmer's knowledge of vegetable prices (0=no, 1=yes)	0.33	0.47	0	1	0.31	0.46	0	1
Farmer traveling to the market just to learn prices (0=no, 1=yes)	0.07*	0.26	0	1	0.12*	0.33	0	1
Social Capital								
Do you agree that most people could be trusted? (Ordinal, 1= strongly disagree, 5=strongly agree)	2.08***	0.69	1	5	2.53***	0.91	1	5
Do you trust the municipal government and their policies towards agriculture? (Ordinal, 1= strongly disagree, 5=strongly agree)	2.31***	0.79	1	5	3.43***	0.73	1	5
Farmer perceptions								
Do you agree that traders tend to withhold important transaction-related information from farmers? (0=no, 1=yes)	0.41***	0.49	0	1	0.75***	0.43	0	1
Do you agree that farmers tend to withhold important transaction-related information from traders?	0.05**	0.21	0	1	0.12**	0.32	0	1

[24] 1 hectare = 100 Ares = 10,000 square metres

(0=no, 1=yes)								
Do you think local government can do more for farmers? (0=no, 1=yes)	0.34***	0.47	0	1	0.65***	0.48	0	1

Notes: *, **, *** indicate 10%, 5% and 1% significance level respectively, for a t-test of the equality of cluster means

a 228 observations

b 220 observations

Significantly more farmers in the high social capital group own their farms, have vehicles for farm-to-market harvest transport and receive off-farm income than farmers in the low social capital group. Note that off farm income could originate from many sources: the farmer himself or from the farmer's family members who contribute to the household's finances from sources which are not farm-related.

Chapter 5 suggested that when present, social capital in Benguet is in the form of informal networks. Grootaert (2002: 56) argued that one of the important ways that social capital contributes to farmer's welfare is the effect of greater profitability through better access to resources as a result of his personal networks. The building up of networks among people in the context of a non-financial social setting spills over into financial benefits (Dasgupta, 1988; Fukuyama, 1995). Coleman (1988: 98) maintains that productive activities are encouraged and motivated in people who share common values and norms. Their structural relations allow them to reap and collectively share the benefits of economic success.

The variable "*need for credit"* accounts for farmers who obtained financial or material credit from a trader for production purposes. It was assumed here that there was no problem with regards to credit access and no rationing of credit: farmers who wanted to borrow production capital acquired it. The table shows that the low social capital group has more farmers who accessed agricultural credit than the high social capital group (54% compared with 35%). Average farm size was also significantly smaller in the low social capital group (49.7 Ares) than in the high social capital group (66.5 Ares). Again, as in Chapter 5, farmers with low social capital appear to have poorer ties and did not associate as well as the other group with other farmers, traders and people in their community. Because of their low community association and participation, farmers in this group do not have the same level of access to resources as the high social capital group. They may have to resort more often to production loans because, for example, information sharing in terms of employment applications, agricultural inputs and technology is lower for farmers in this group (Grootaert, 1998; Grootaert, 2002: 4, 63).

More farmers in the high social capital group experienced delayed payments and conflicts with traders compared to the low social capital group. Moreover a significantly higher proportion of farmers in the high social capital group believe that traders have a tendency to withhold critical transaction related information to farmers and that farmers have a tendency to withhold important transaction-related information to traders. Farmers in the high social capital group put relatively more trust in people, in the institutional environment and in organizations, meaning they also expect others to behave in a trustworthy manner (Beugelsdijk and Schaik, 2001: 18). They expect their trading partners not to exploit their vulnerability. The hypothesis is that the good faith of farmers in the high social capital group may have

been taken advantage of by trading partners through but not limited to, delayed payments and withholding critical transaction-related information. For this reason, more farmers in this group believe that traders and farmers have higher tendency to withhold information. Our assumption is that the lower numbers of positive responses on the statement "*Do you believe farmers have a tendency to withhold critical market information from traders*" suggest that farmers are referring to themselves when they replied to this question (otherwise, the means would have been higher). Still it was observed that more farmers from the high social capital group have a tendency towards honesty, because they admit to this fact.

Now that farmers are grouped according to their social capital, we want to see the total number of farmers that actually selected a certain governance structure. Table 7.2 shows farmers' trader choice for the low social capital group, the high social capital group and the pooled sample. Across groups and the pooled sample, it is clear that more farmers used commissioners as their preferred trading partners while the contractors are the least employed trader types.

Table 7.2 Farmers' trader choices by social capital group

Trader type	Low Social Capital group	High Social Capital group	Pooled sample
Commissioners	125	135	260
Contractors	25	23	48
Wholesalers	80	62	142
Total	230	220	450

Pearson chi2 (2) = 2.5287	Pr = 0.282
Likelihood-ratio chi2 (2) = 2.5337	Pr = 0.282
Gamma = -0.1362 ASE = 0.085	Approx sig: 0.112
Kendall's tau_b = -0.0720 ASE = 0.045	Approx sig: 0.112

The null hypothesis that the distribution of farmers based on the trader type they selected is independent of their social capital group was tested. Using the Pearson and Likelihood Ratio chi2 tests, resulting significance values (Pr=0.282 and Pr=0.282 respectively) leads us to fail to reject Ho and conclude that trader choice is independent of their social capital group. In order to determine the strength, direction and relationship between row and column variables, we use ordinal symmetric measures such as Goodman and Kruskal's gamma and Kendall's tau_b. Significance value of 0.112 for gamma and also for Kendall's tau_b indicates there is no relationship between the distribution of farmers based on their selected traders and their social capital. However, this does not mean that there is no difference in the way high and low social capital farmers choose traders. It just signifies that the outcome, in relative frequencies, is the same.

7.4.2 *Trading partner*s and their governance structures

The following sections distinguish the three trading partners and the unique governance structures they implicitly offer to farmers.

Commissioners – Commissioners act as intermediaries for farmers. Their first function is to facilitate trade between farmers and their buyers. As a secondary function, they provide market information to farmers, in particular about prices, during the search process for buyers. The availability of market information is

inversely related to the farm-to-market distance. The hypothesis is that farmers who are farther from trading posts are more likely to use commissioners because commissioners will provide them with market information and at the same time, broaden farmers' chances of obtaining higher buying prices due to their perceived wide acquaintance base. By nature, farmer-commissioner relations are price motivated. In this case, the identity of the trading partner and the farmers' relationship with him does not matter. In general, there is a low trust level between farmers and commissioners. A farmer who selects a commissioner is aware that behavioral uncertainty with commissioner-led transactions is high.

Since commissioners merely facilitate between farmers and their intended buyers, farmers know that using commissioners provides them the freedom to choose another commissioner when the transaction fails. It frees farmers from forming relational ties that might hinder additional income in the future.

Farmers that speak the same dialect with the commissioner, which equates to belonging to the same ethnic group, are more likely to choose commissioners because shared language facilitates communication. Commissioners actually use the dialect to their advantage in order to approach farmers in the trading post and secure transactions.

Farm land for agricultural purposes is difficult to acquire in the region because of ancestral ownership claims, residential encroachment, steep slopes and spatial competition among growers. It is hypothesized that farmers who cultivate bigger farms in the region are financially better off. It means they can afford to take risks by using the market and choosing the commissioner as a trading partner, in order to increase their chances of capturing higher market prices.

Wholesalers **–** Wholesalers are the end-buyers of the farmers. Their primary function is to buy farmers' harvests in the trading posts. This means transactions between farmers and wholesalers involve an immediate transfer of property rights over the vegetables. The wholesalers' secondary function is to be farmers' sources of critical production inputs such as chemicals, seeds and fertilizers. They are the farmers' primary sources of informal credit. When wholesalers supply production inputs, there are two ways for the farmers to pay it off: the most common way is that the farmer will promise to sell his crops to the wholesaler. The less common payment is to repay in cash with (relatively high) interest. When prices fluctuate, farmers are not able to recoup the costs of production and are indebted to the wholesalers. Farmer-wholesaler relations have a tendency to be driven towards *locked-in* effects from the supply of production inputs and the safeguards provided by this governance structure. By *locked-in* effects we mean, that farmers who received production inputs are bound by their promise or by their debt to wholesalers, and are restricted into selling to wholesalers. By safeguards, we mean that the farmer has a guaranteed buyer. Another safeguard is that a direct transaction between farmer and wholesaler means fewer complications because there is no middleman involved. The farmer can be assured that the vegetable payments go directly to him, based the farmer and the wholesalers' agreement. The price begins to play a minor role in coordination, while production inputs, partner identity and the safeguards that the relationship provides are gaining importance. We hypothesize those farmers who have bigger farms are richer than other growers. This means that the farmers already have enough means for production

and do not need to obtain agricultural credit Assuming that they are better off, farmers with large farms are also more open to bargaining and taking risk in an attempt to capture high market prices. Thus, farmers that have bigger farm sizes are less likely to use wholesalers.

Wholesalers are the "moneyed" traders. They hire or own warehouses in La Trinidad or Baguio city where they keep vegetables in storage. Wholesalers mostly originate from Manila. There are few big wholesalers that are local to the province, and most of them even work for Manila-based wholesalers. For this reason, wholesalers are therefore viewed as outsiders. Farmers who attach importance to ethnicity and their local municipalities would avoid using wholesalers.

Using wholesalers allows the farmers little room to discover prices or to bargain. Wholesalers do not provide as much market information as commissioners because unlike commissioners, the search process for transacting partners (that provides price information) is limited. We hypothesize that farmers who live in remote municipalities are less informed about prices and would therefore prefer to transact with traders that provide as much market information as possible. For this reason, farmers who live farther away from trading posts are less likely to use wholesalers.

Contractor **–** Like wholesalers, contractors buy directly from farmers. Transacting with contractors implies that property rights over the vegetables are transferred immediately, at the farm level. The strength of the farmers' personal relationship with the contractor, which is determined by mutual adjustment and relationship-building, motivates the governance structure. Trust is built between farmer and contractor from repetition and reputation. Repetition refers to the recurrent frequency of farmer-contractor transactions while reputation refers to the importance of the identities of transacting parties. Trust is critical, particularly when contracting involves the farmer's income for the whole season. For this reason, it is first and foremost an expectation that high social capital positively influences the choice for contracting. However, it is important to differentiate between interpersonal trust and institutional trust. In Chapter 5 we showed that although farmers' trust towards their core environment is high (interpersonal), at the same time, they also exhibit low trust towards their external environment (institutional). Interpersonal trust is at a different level than institutional trust. We expect that farmers who put trust in local institutions such as the municipal government are not necessarily trusting overall. Their trust in local institutions probably signifies that they put value in things that are local. For this reason we hypothesize that farmers who have institutional trust are more likely to select local traders (commissioners and contractors) and less likely to use non-local traders (wholesalers).

Another feature of the farmer-contractor marketing link is the distribution of risk between the two transacting parties. Since contractors take over harvest and post harvest activities while the vegetables are still at farm level, the risk of losses from transportation and quality decline is taken off the farmers and shouldered by contractors. Moreover, contractors are taking over agro-ecological risk from harvest time onwards, as well as institutional risk in the form of price fluctuations. Thus, it is hypothesized that farmers who are financially better of by having no need for credit are not afraid of losses and would prefer governance structures other than contracting. Similarly, farmers who have years of vegetable marketing experience are already able

to predict annual price trends and know how to cope with risk. For this reason, experienced farmers are less likely to use contractors and more likely to use other governance structures.

Contractors are less used by farmers who live in remote communities because contactors are concentrated in trading centers. This makes them have less interaction with farmers. Contractors also try to reduce transportation costs by focusing on farms nearby.

7.5 Estimation Results

Using the pooled model of 41 variables, a likelihood ratio test (LR) was conducted to see if segmenting the observations into two groups, Group 1 with low social capital and Group 2 with high social capital fits the data set better than using a pooled sample. The resulting likelihood ratio was equal to 77.23 (df =30; p=0.000) meaning there is a statistically significant difference between the β's of the two sub-models. Therefore, it gives richer results to segment the sample into low and high social capital groups and separately explain their governance structure choice. For this reason, only estimation results of segmented groups are presented and discussed from hereafter. Test results from the pooled model are shown only in the prediction table for comparison purposes.

Thus, in the first round, two sub-models (Group 1, with low social capital and Group 2 with high social capital) both consisted of 41 explanatory variables. Later, parameters that did not appear significant in both models in the subsequent rounds of testing were eventually removed. The initial 41 variables were composed of 19 farmer, farm and transactions characteristics and 22 farmer's social capital statements. In the final rounds, 14 variables remained for each model.

7.5.1 The choice of governance structures

Table 7.3 presents the results of the multinomial logit estimation of the models using low and high social capital clusters. The choice for commissioners was set as the base group. The *p*-values are presented under the coefficients in parentheses.

The two social capital groups seem to base their trader choice on different factors. Oftentimes, variables which are found to be significant in the choice of the low social capital group are found insignificant in the selection process of the high social capital group and vice versa. Three variables however, appear to influence in the same way the choice of traders for both social capital groups. Vehicle ownership, perception of the openness of farmers and institutional trust negatively influences the selection of contractors over commissioners but is positive for the selection of wholesalers relative to commissioners, regardless of social capital grouping.

Table 7.3 Factors explaining farmer's choice of governance structure for the low and high social capital group

	Estimates for Low Social Capital Group [a]	Estimates for High Social Capital Group [b]
Contractor		
Age	0.050	0.096**
	(0.354)	(0.040)
Years farming	-0.014	-0.121**
	(0.796)	(0.022)
Farm size	-0.022*	0.003
	(0.073)	(0.489)
Farm-to-market distance	0.007	-0.860***
	(0.976)	(0.001)
Land ownership	-0.317	-1.642**
	(0.687)	(0.039)
Dummy for Kankanaey ethnicity	-0.822	0.163
	(0.349)	(0.827)
Experience of delayed payment	0.403	-2.879***
	(0.562)	(0.000)
Need for credit	-3.510***	-1.268
	(0.000)	(0.167)
Knowledge of vegetable prices	3.924***	-0.181
	(0.000)	(0.801)
Vehicle ownership	-2.042**	1.422
	(0.034)	(0.105)
Perception that traders withhold critical transaction-related information	2.074**	1.496
	(0.026)	(0.119)
Perception that farmers withhold critical transaction-related information	-3.777**	-1.293
	(0.018)	(0.211)
Trust towards municipal government/ institutional trust	-0.996**	-0.598
	(0.032)	(0.219)
Other off-farm income sources	0.036	-0.662
	(0.971)	(0.405)
Constant	-1.192	1.443
	(0.600)	(0.557)
Wholesaler		
Age	0.024	0.004
	(0.544)	(0.907)
Years farming	-0.0466	-0.004
	(0.281)	(0.919)
Farm size	-0.009*	-0.042***
	(0.091)	(0.000)
Farm-to-market distance	-0.254	-0.201
	(0.174)	(0.179)
Land ownership	0.104	0.877
	(0.838)	(0.210)
Dummy for Kankanaey ethnicity	-3.763***	-2.285***
	(0.000)	(0.000)
Experience of delayed payment	0.335	1.501**
	(0.528)	(0.006)
Need for credit	0.624	0.292
	(0.256)	(0.538)
Knowledge of vegetable prices	0.078	0.484
	(0.901)	(0.379)
Vehicle ownership	-1.241*	0.024
	(0.092)	(0.967)
Perception that traders withhold critical transaction-related information	-1.179	0.368

	(0.742)	(0.570)
Perception that farmers withhold critical transaction-related information	-2.748**	-1.124
	(0.038)	(0.158)
Trust towards municipal government/ institutional trust	-0.620*	0.106
	(0.053)	(0.746)
Other off-farm income sources	1.610**	0.536
	(0.034)	(0.318)
Constant	3.049*	0.100
	(0.065)	(0.957)

[a] Number of observations: 230
Dependent variable: Trader type (0) commissioner, (1) contractor, (2) wholesaler. Reference category is commissioner. $\chi^2 = 230.97$ ***, $p<0.01$, Pseudo $R^2 = 0.5342$
[b] Number of observations: 220
Dependent variable: Trader type (0) commissioner, (1) contractor, (2) wholesaler. Reference category is commissioner. $\chi^2 = 185.52$ ***, $p<0.01$, Pseudo $R^2 = 0.4723$
Notes: *, **, *** indicate 10%, 5% and 1% significance level, respectively

Observe that farm size has a negative effect on the selection of wholesalers relative to commissioners for both social capital groups but is only negative for the selection of contractor rather than commissioners in the low social capital group. Furthermore, Kankanaey ethnicity makes farmers in both social capital groups more likely to choose commissioners and less likely to choose wholesalers. Details of these are more closely examined using the marginal effects later on.

In order to have an overall picture of how well the two models managed to predict farmers' governance structure choices, Table 7.4 is constructed. It contrasts the choices predicted by the model with the actual choices made by the farmers.

Table 7.4 Prediction table for low and high Social Capital groups and pooled sample

Predicted	Actual		
	Commissioner	Contractor	Wholesaler
Low Social Capital			
Commissioner	106	7	12
Contractor	6	16	0
Wholesaler	13	2	68
Total	125	25	80
High Social Capital			
Commissioner	120	10	14
Contractor	3	11	1
Wholesaler	12	2	47
Total	135	23	62
Pooled			
Commissioner	226	20	28
Contractor	7	19	5
Wholesaler	27	9	109
Total	260	48	142

The choice model for the low Social Capital group has a pseudo R^2 of 0.53 and correctly predicted 190 of the 230 (83%) observations. It predicted less correctly for commissioner choice relative to the second model. However, the model for the low social capital group was better at predicting contractor and wholesaler choice within the group. The choice model for the high social capital group correctly predicted 178 out of 220 (81%) observations. It has a pseudo R^2 of 0.47.

7.5.2 The marginal effects

The multinomial logit results are better interpreted when using marginal probability. Marginal probability measures the likelihood of choosing an alternative option with an infinitesimal change in the explanatory variable $\left(\partial\ prob_j / \partial\ x_j\right)$, assuming other variables remain constant at the mean or average level. However, for continuous variables, we assume a one *unit* change (for example, age increases by one year) when interpreting the effect of a change in age towards governance structure selection. For discrete variables, we assume a discrete change from 0 to 1 (for example, from land owner to land tenure) when interpreting the effect of land tenure towards trader choice. The marginal effects of the models for the low and high social capital group are shown in Table 7.5. P values are written in parenthesis under the marginal coefficients.

The variable age was also not a significant factor in the selection of governance structures of farmers in either group. This means that farmers with low and high social capital, young and old alike were not influenced by their age in terms of choosing transacting partners. Longer farming experience, on the other hand, made farmers in the high social capital group less likely to select contractors but didn't have an effect on the low social capital group's decision-making. Farmers with long farming experience are seen to know yearly price trends and are therefore aware of the risks of marketing crops. Through their farming experience, they are assumed to be able to discern which strategies to employ to reduce risk. Therefore trading with contractors that offer risk reduction is not as crucial anymore.

Increasing farm size in both groups increases the likelihood that commissioners are selected. However, for the high social capital group; bigger farms also reduce the probability that wholesalers are chosen. Arable land is scarce in the province where steep slopes characterize the terrain. Farmers with big farms are most probably financially better off compared to farmers with smaller parcels. Farmers who are better off could afford to take the risk of selling their products through spot markets via commissioners in an attempt to capture higher market prices. This makes commissioners more preferred rather than wholesalers because trading with wholesalers does not allow the farmer much room to negotiate and bargain.

Whereas the variable *distance* did not play any role in the selection process of farmers in the low social capital group, distance is a critical variable that farmers in the high social capital group consider in the selection among three governance structures. Distance has direct impact on crop quality and farmer's income. For farmers in the high social capital group, farm-to-market distance increased the probability of selecting of commissioners and reduces that of contractors. Distance does not only affect the perishability of crops but also have an effect on the social capital between farmers and traders. It is a fact that physical inaccessibility reduces the rate of social and economic exchange between farmers and traders. However, the variable was not significant in the choice structure of farmers in the low social capital group. Farmers with low social capital who attach little importance to frequent interaction and relationship-building would naturally find distance irrelevant in their decision-making.

Results concur with Chapter 4 where we discussed that Benguet farmers follow von Thünen's theory of land use. Farmers who cultivate high value crops are located more often near the centres where land rent is expensive. Contractors prefer to buy high value crops for institutional consumers that are located in the cities. Relatively lower value crops, and those that are storable and less perishable are cultivated in the remote areas. Commissioners are found to mediate for almost every crop in the market, but have a tendency to facilitate the sale of lower value crops from farther municipalities.

Farmers with low social capital did not permit their land tenure status to influence their decision-making whereas farm-ownership increased the probability of farmers in the high social capital group to select wholesalers. Growers who cultivate their own farms do not need to pay rent to the landlord. For this reason, farmers are relatively under less strain to increase incomes by capturing market prices or to reduce risk making wholesalers the preferred choice.

Regardless of social capital group, being of Kankanaey ethnicity increases the tendency to select commissioners *ceteris paribus* but reduces the probability of selecting wholesalers. From a parallel survey of 195 traders which was conducted at the same time as farmer interviews, a total of 102 traders were of pure Kankanaey descent while 20 traders were of mixed-Kankanaey origin. Therefore, the results suggest that holding other variables constant, farmers of Kankanaey origin are more likely to select commissioners because they prefer to conduct transactions with traders with whom they can communicate well.

Table 7.5 Marginal effects for governance structure choice for low and high Social Capital groups

Variable	**Commissioners**	**Contractors**	**Wholesalers**
Low Social Capital			
Age	-0.005	0.001	0.004
	(0.498)	(0.445)	(0.564)
Years farming	0.009	-0.000	-0.009
	(0.290)	(0.968)	(0.286)
Farm size	0.002*	-0.000	-0.001
	(0.053)	(0.196)	(0.114)
Farm-to-market distance	0.046	0.001	-0.047
	(0.186)	(0.771)	(0.173)
Land ownership	-0.014	-0.007	0.021
	(0.884)	(0.681)	(0.821)
Dummy for Kankanaey ethnicity	0.676***	0.007	-0.683***
	(0.000)	(0.540)	(0.000)
Experience of delayed payment	0.067	0.006	0.060
	(0.502)	(0.645)	(0.536)
Need for credit	-0.015	-0.124**	0.139
	(0.886)	(0.032)	(0.133)
Knowledge of vegetable prices	-0.168	0.207**	-0.040
	(0.190)	(0.027)	(0.702)
Vehicle ownership	0.204**	-0.023	-0.182**
	(0.019)	(0.137)	(0.035)
Perception that traders withhold critical transaction-related information	-0.011	0.057	-0.047
	(0.917)	(0.135)	(0.628)
Perception that farmers withhold critical transaction-related information	0.269***	-0.022	-0.247***
	(0.000)	(0.114)	(0.000)
Trust towards municipal government/ institutional trust	0.127**	-0.016	-0.111*
	(0.035)	(0.159)	(0.061)

Other off-farm income sources	-0.351**	-0.010	0.359**
	(0.042	(0.512)	(0.038)
High Social Capital			
Age	-0.003	0.003	0.000
	(0.379)	(0.103)	(0.996)
Years farming	0.004	-0.004*	0.000
	(0.361)	(0.082)	(0.986)
Farm size	0.003***	0.000	-0.004***
	(0.000)	(0.167)	(0.000)
Farm-to-market distance	0.042**	-0.027**	-0.015
	(0.022)	(0.029)	(0.283)
Land ownership	0.029	-0.978	0.069*
	(0.737)	(0.191)	(0.099)
Dummy for Kankanaey ethnicity	0.252**	0.145	-0.266**
	(0.003)	(0.493)	(0.002)
Experience of delayed payment	0.018	-0.155**	0.137**
	(0.815)	(0.006)	(0.006)
Need for credit	0.006	-0.037	0.031
	(0.902)	(0.147)	(0.498)
Knowledge of vegetable prices	-0.040	-0.007	0.047
	(0.521)	(0.731)	(0.410)
Vehicle ownership	-0.062	0.067	-0.005
	(0.397)	(0.238)	(0.926)
Perception that traders withhold critical transaction-related information	-0.063	0.036	0.027
	(0.260)	(0.122)	(0.588)
Perception that farmers withhold critical transaction-related information	0.097**	-0.027	-0.071*
	(0.029)	(0.150)	(0.077)
Trust towards municipal government/ institutional trust	0.008	-0.020	0.011
	(0.810)	(0.220)	(0.693)
Other off-farm income sources	-0.036	-0.020	0.056
	(0.582)	(0.304)	(0.361)

Notes: *, **, *** indicate 10%, 5% and 1% significance level, respectively

An experience of delayed payment with the current trader does not play a role in the selection process of farmers in the low social capital group but has a profound effect in the high social capital group. Farmers in the high social capital group who experienced a postponement in payments have lower probabilities to use contractors but higher probabilities to use wholesalers. It seems that a delayed payment from a wholesaler is an accepted fact by farmers in the high social capital group. For this reason, despite the experience of delayed payments, farmers will still transact with wholesalers. In Chapters 4 and 6 we showed that farmers use contractors not only because of risk reduction but also because it offers the most assured and quickest way of getting the farmer's income. The organization of governance and the contractual relationship between farmers in the high social capital group and contractors is structured in such a way that contractors are not expected to pose payment delays in transactions. If contractors *do* delay payments, farmers would naturally prefer to transact with another trader because a payment delay signals that there is no difference between trading with contractors and with other traders. When contractors delay payments, the benefits that the farmer obtains from trading with contractor, in terms of quick and assured payments, in exchange for lower buying prices, are missing.

Need for credit did not significantly influence governance structure selection among farmers in the high social capital group but decreased the probability of selecting

contractors in the low social capital group. Our survey showed that among the 125 farmers in the low social capital group that needed loans for agricultural production, 48% borrowed from commissioners, 50% borrowed from wholesalers and only 2 percent obtained from contractors. Given that farmers in this group have lower social capital, they are already less predisposed to borrow from contractors. And since, borrowing money entails paying it off in cash or selling the produce to the lender at the end of the cropping season, farmers in the low social capital group will naturally have decreased probabilities to sell to contractors.

Knowledge of vegetable prices didn't influence the decision-making of farmers in the high social capital group but increased the probability of choosing contractors in the low social capital group. Farmers who enter contractual agreements know that contractors will shoulder harvest and transportation costs of the crop. Because farmers in the low social capital group have weaker ties with contractors in general, we suppose that farmers would want to take advantage of risk reduction offered by contractual agreements only when they are certain that the price offer of contractors are consistent with current market prices.

Vehicle ownership was not an issue in the selection of governance structure among farmers in the high social capital group. For farmers in the low social capital group, owning a vehicle increases by 0.20 the probability of using commissioners but decreases the probability of using wholesalers by approximately the same magnitude. This is what we suppose: farmers with low social capital who have the means to transport produce to the physical markets would tend to prefer governance structures that also require lower social capital between trading partners. For this reason, commissioners are selected over wholesalers. The presence of a vehicle that they can use to transport vegetables allows them the mobility to bring the vegetables back to the farm and back again to the market the next day, when the crops are not all sold by the commissioner.

Farmers in the high and low social capital group also decide similarly when considering perceptions that they themselves withhold important information from traders. The low mean values obtained for this variable during the survey (in Table 7.1) suggest that farmers are describing themselves when they answered the question. Farmers who admit that they and co-farmers tend conceal facts from traders are more likely to choose commissioners but are less likely to choose wholesalers. Remember that in commissioner-based transactions farmers has the option to change governance structures as soon as the current transaction is completed. In Chapter 6 where we argued that commissioner-based transactions are characterized by self interest in gains (the reason why farmers lie) while wholesaler-based transactions put more value in reciprocity and partner identity.

Institutional trust did not play a role in the selection process of farmers in the high social capital group but had a substantial impact on the decision-making of farmers in the low social capital group. Increasing institutional trust of farmers in the low social capital group increased their likelihood to choose commissioners but decreased their likelihood of choosing wholesalers. Since commissioners are regarded by farmers as the most local among the three trader types, farmers who have faith in local institutions are also more likely to patronize local traders.

The availability of off-farm income for the farmer and his family was not a decisive factor in the selection process of farmers in the high social capital group. However, farmers with low social capital who had off farm income sources are less likely to use commissioners and more likely to select wholesalers. This makes sense; farmers who have other sources of cash outside the farm feel less pressured to capture high market prices through commissioners. Farmers prefer to transact with wholesalers who will give an upfront price and receive the money payment immediately.

7.6 Summary and Conclusions

The chapter set out with the two-fold objective of determining and analyzing factors that would explain farmer's selection of governance structures and examining whether social capital plays a role in farmer decision-making. Cluster analysis was used to segment 450 farmers into low and high social capital groups. The two segments were independently tested using multinomial logit analysis. A likelihood ratio test comparing the two models with a model using pooled observations suggest that farmers with low social capital approach decision making in a different way from farmers with high social capital.

A t-test comparing the means of several variables between low and social capital groups revealed that significantly more farmers in the high social capital group owned vehicles, bigger farms and had additional off farm income sources for the household. Farmers in the low social capital group had significantly smaller farm sizes but availed themselves more of agricultural credit than farmers in the high social capital group. These farmers also lived significantly nearer to the vegetable trading centers but traveled less often to the markets.

Analysis showed that farmers' decision-making was influenced by their inherent social capital. Specific only to low social capital farmers, distance, land ownership, and an experience of delayed payment did not play any role in their selection process. However, these variables had profound effects on the selection process of high social capital farmers. Specific only to high social capital farmers, need for credit, knowledge of vegetable prices, vehicle ownership, institutional trust and presence of off farm income sources did not influence farmer choice of governance structure. However, these variables had substantial effects on the selection process of low social capital farmers. The variables age and the perception that traders withhold critical market information had no consequence whatsoever in the selection process of both groups. The farmers' Kankanaey ethnicity and the opinion that farmers also withhold critical information from traders had similar effects on decision making for all farmers.

Most of the significant marginal effects on the choice of governance structure involve a switch between commissioners and wholesalers. In other words, if the increase in a determinant has a significant positive effect on the choice for commissioners, it usually has a significant negative effect on the choice of wholesalers and vice versa. The determinants for the choice of contractors, if significant, do not show any appreciable effect on the selection of either commissioner or wholesaler.

In summary, our analysis was able understand the reasons why farmers prefer to use certain governance structures instead of the alternative. The model was able to

confirm that social interaction plays a role in the selection process of local farmers. Empirical tests point to the evidence that not only farm and farmer characteristics but transaction attributes (such as farmers' need for agricultural credit and means of production and an experience of delayed payment) and social capital are critical factors used by farmers in their decision-making. Our results suggest that the influence of social factors should not be overlooked because social factors could provide additional explanations behind the favoured-buyer marketing arrangements in provincial vegetable trade.

Chapter 8: Discussions, conclusions and strategy options

8.1 Introduction

The research described in this thesis investigated the production and marketing system of temperate vegetables in Benguet in northern Philippines using New Institutional Economics approach. Benguet was chosen as the study area because of its important role as major supplier of vegetables to the whole country while at the same time exhibiting features of a "Less Favoured Area" (LFA). An LFA is an area that faces agro-ecologic and socio-economic resource constraints that allow only low level incomes to be realized (Oskam *et al.*, 2004: 447). According to Ruben and Pender (2004: 304) feasible development pathways for LFAs can be developed if we create strategies that work with the comparative advantage of the area. The central idea is that once critical issues concerning production and resource management are identified, feasible livelihood options and development pathways unique to the LFA can be determined. Strategies can be tailored to target the area's most limiting socio-economic and agro-ecologic constraints leading to tailored rural development and poverty alleviation.

More than 50% of the provincial population of Benguet are involved in one way or another with the agriculture sector. The significance of agriculture for the region has resulted in a considerable number of studies that have been carried out for the production aspect. However, research focusing on the marketing aspect has been neglected. Research analyzing production and marketing from an institutional economics approach has not been carried in the province despite the important role of institutions in the organization and conduct of both activities.

A two-pronged research approach was developed for Benguet: on the one hand considering the institutional economic dimension and on the other, some other socio-economic dimensions. The framework we used to analyse vegetable production and marketing in the province is a fusion of Williamson's (2000) *Economics of Institutions* paradigm and the *Structure-Conduct-Performance* (SCP) approach. The scheme combines institutional environment with structure analysis, governance structure with conduct analysis and resource allocation with performance analysis.

The purpose of the research described in this thesis is to provide information on vegetable production and marketing in the Philippines, the social capital of the agricultural communities, the various governance structures used for vegetable transactions and farmer's selection process of governance structures. Accordingly, the information and discussions about these topics comprise the four core chapters of this research. The four core chapters were guided by the integrated framework that was developed in Chapter 2.

The results of the integration of the two methods proceed as follows: first, the framework is used to characterise and provide a better understanding of vegetable production, farm size structure, marketing practices, price margins, and vegetable sales in the province. Second, the social embeddedness level is studied by measuring social capital levels of farmers and traders. Third, transaction attributes and corresponding transaction costs of governance structures are evaluated. In here,

another framework is developed; a schema that classifies the most efficient contract types for governance structures (one that minimizes most on transaction cost) given transaction attributes. The fourth core chapter used the embeddedness information to model how the social capital of farmers influences their decision to transact with commissioners, wholesalers and contractors.

Chapter 8 consolidates the findings and important conclusions of all previous chapters. In section 8.2, conclusions from core chapters and answers to research questions are presented. Based on research findings, feasible development strategies that address Benguet's developmental constraints as a Less Favored Area are tailored in section 8.3. By focusing on the dynamics of agro-ecological and socio-economic factors at the production and marketing level of vegetables in the province, some developmental interventions that are unique to the region's needs are recommended. The chapter ends in section 8.4 with limitations of the study and possibilities for future research.

8.2 Conclusions from core chapters and answers to research questions

In **Chapter 2** we developed an integrated framework that is designed to meet the objectives of analysing the Benguet vegetable sector from an Institutional Economics perspective. In Table 8.1 the framework is recalled to present important conclusions of the research. The names of the four levels of social analysis are shown on the left column and their corresponding purpose is identified on the middle column. The right column shows are the most significant results based on the approach.

Results from **Chapter 5** show that social capital in the province is in its strongest in the form of common goals and informal networks. All municipalities scored lower than the middle point level of social capital. The middle point of total social capital range was standardized at 50, where 0 means no social capital and 100 means full social capital based on the variables used by the study. The calculations were based on an additive model that used a series of questions measured at 5-piont scale. For farmers and traders, it was the low rate of membership in formal associations that pulled total social capital scores down. Specifically for farmers, their informal networks seemed to drive social capital formation. Social capital scores for farmers showed that they had significantly better community relations than traders. Among traders, external trust explained their social capital motivations. Traders also scored higher memberships in formal organisations than farmers. It is mainly for this reason that their social capital index was higher relative to farmers.

Participation in formal organizations is equally important as being associated in informal networks. For people involved in a business, the benefits of an extended social network outweigh the disadvantages. Particularly in Benguet agriculture, formal organizations can serve as a conduit for important market information, provide bargaining power and broaden the farmer or trader's network of marketing contacts.

Table 8.1 *Economics of Institutions* and the *Structure-Conduct-Performance* of vegetable production and marketing in Benguet, northern Philippines

Level	**Purpose**	**Important Conclusions**
Level 1 Embeddedness	Spontaneous (*Social embeddedness was studied in the context of social capital*)	Low membership rates in formal organizations. Low institutional/external trust levels. Social capital in the province is in its strongest in the form of informal networks and collective goals but this is insufficient to facilitate market information exchange and is inadequate to bind farmers together to provide countervailing power.
Level 2 Institutional Environment and *Structure*	Get the institutional environment right 1st order economizing	Traditional marketing practices strongly influence vegetable trade. Missing formal policies that address critical production and marketing issues and disagreements. Underdeveloped agricultural credit system perpetuates *suki* patronage system and *locked-in* effects. Dual structure in farm size structure and distribution of farm land.
Level 3 Governance structures and *Conduct*	Get the governance structures right 2nd order economizing	The three governance structures and the activities within each have evolved into optimal modes of organization, in terms of contract types used by transacting parties. Commissioner-governance is the most commonly used governance structure although it exhibits strongest transaction uncertainty (mostly shouldered by farmers) compared to other arrangements. Contractor-governance incurred high transaction costs and lowest uncertainty. Although farmers' harvest and post-harvest risks are reduced in this arrangement, it is the least used governance structure. Involves the most trust in the trading relationship compared to the other arrangements. Wholesaler governance incurred lowest transaction costs from low negotiation and monitoring costs and is therefore, the most optimally aligned from a transaction costs perspective. Looking closely, wholesaler governance incurs low transaction costs because the nature of credit repayment for production loans pushes farmers into *locked-in* situations with wholesaler which creates a trade-off in terms of transaction costs.
Level 4 Resource allocation and employment and *Performance*	Get the marginal conditions right 3rd order economising	Dual market structure is observed: Many small farmers and traders share a small portion of total market sales while few big farmers and traders share a big portion of total market sales. The dual structure in total market sales is more skewed (distinct) among farmers than among traders.

Gender, education, religion, age and ethnicity influence provincial social capital in varying degrees. To build the *bridging* social capital of the community, women are better mobilized than men with regards to social capital because women have denser community relations. Investments in education for community members will pay off because educated people have increased levels of general and institutional trust compared to low educated persons. Religion is a strong force that can be tapped to increase volunteerism and community participation among the population. The youth are less participative in formal organizations compared to community elders. Since low membership rates in formal associations was one of the reasons why total social capital scores were low, it is important to begin encouraging the youth to participate in formal organizations. The benefits of joining formal organizations should be explained to them. Belonging to an ethnic group negatively influences trust towards the municipal government and discourages volunteerism but positively influences relationship with traders and encourages membership in trader organizations. We discussed that a common experience among people of different ethnicities can override ethnic barriers and cause them to have a collective perception of the institutions that surround them.

In **Chapter 4**, we observed an increase in total area of arable lands (in hectares) in the province although farms showed a tendency towards fragmentation and parcelization based on the pattern of increase in the total number of farms of one hectare and smaller since 1980. A dual structure is observed in terms of farm size and farm land distribution: many small farmers own small farms while a few big farmers own large farms. Steep slopes, poor farm-to market roads and missing market infrastructures characterise the province. Cropping strategies in the province resembles the Von Thünen theory of land rent, where higher value crops are planted nearer to the centres to take advantage of the higher land rent. Lower value vegetables that are more storable and transportable are planted in the remote areas and peripheries because of the lower land rent.

The *suki* is an institution in the Benguet vegetable sector. It is a system of patronage where a farmer and trader regularly trade with each other in order to receive better transaction terms. However, because of loan arrangements, the *suki* system has the potential to trap farmers into *locked-in* situations which is disadvantageous in the long run. With regards to the formal institutional environment, rules and regulations that address common sources of disagreement between farmers and traders – prices, volume, value, delayed payments, the credit system – are missing.

Intensive production makes farmers rely heavily on fertilizers and chemicals leading to an increase in production costs. To finance production, farmers could approach banks, cooperatives and trader-financiers. However, banks have voluminous documentation requirements and most cooperatives do not have enough money for loans (Gimenez and Bagyan, 2004). Traders, in particular, wholesalers, are the more common source of agricultural credit even though borrowing from the trader implies paying off with high interest rates or directly selling crops upon harvest to the trader. The current state of the formal agricultural credit system in the province perpetuates the loan agreements within the *suki* arrangement and creates *locked-in* effects for the farmers.

Sales values reflect a dual structure in the vegetable sector. There are many small farmers (and traders) in the province engaged in small scale production (and marketing). There are also a few big farmers (and traders) carrying out production (and marketing) in a bigger scale. Closer inspection showed that the dual sales structure is more distinct among farmers than among traders. Analysis of mean buying prices of commissioners, wholesalers and contractors indicate that the buying offers of the different traders do not significantly vary for low value crops. However, contractors have a tendency to offer the lowest buying prices for low value crops among the three governance structures. Contractors have a tendency to offer higher buying prices for high value crops, although tests showed that their buying offers were significantly higher only in the case of lettuce.

Three general contract types were discussed in **Chapter 6**. In classical contracts, price is the main coordinating mechanism while safeguards and identities of trading partners are not important. In neoclassical contracts, safeguards and prices are the most important coordinating mechanisms while partner identity is starting to matter. In relational or long term contracts, trading partner identity is crucial because mutual adjustment, safeguards and mutual interest in gains coordinate farmer and trader actions.

The three trader types in Benguet marketing system were introduced. With a total of 260 farmers and 100 commissioners using this arrangement, the most common trader type is the commissioner. This governance mode use vegetable prices as the main coordinating mechanism. Commissioner-based governance exhibits low asset specificity, low transaction frequency and strong transaction uncertainty. Because of uncertainty, this governance structure incurs the highest monitoring and enforcement costs among the three governance modes, costs of which are mostly shouldered by growers. It incurs moderate transaction costs overall.

The second most common mode of governance is the wholesaler-based coordination. A total of 142 farmers and 82 wholesalers are involved in wholesaler-based governance. To coordinate players' actions, price is still the main motivating force but the identities of the partner matter. Safeguards become more important in the relationship because they can partly function as coordination mechanism. Wholesaler-based governance exhibits moderate asset specificity, frequency and uncertainty. Total transaction costs are low because of the trade-off with *locked-in* effects.

The least common mode of governance is contractor-based structures. Only 48 farmers and 13 contractors were using contractor-based arrangements in the survey. Mutual adjustment and relationship-building motivates transacting parties to exchange with each other. Therefore partner identities are highly relevant. Transactions in a contractor-based governance exhibit high asset specificity and high frequency but low uncertainty. Due to friendship and the nature of activities involved within this governance structure, harvest and post harvest risk is reduced on the farmer's side. Contractor-organized transactions incur high transaction costs compared to the other two governance structures.

By considering the analysis from a purely transaction costs-point of view, the most optimal governance structure would be the partly market, partly-credit based (hybrid) neo-classical contract that wholesaler-based arrangements use. This is followed by

market-based commissioner- and hybrid (partly market, partly relation based) contractor- modes of organization. However, considering the circumstances in which exchange relations are formed, then the reason behind low costs is because farmers are caught in a locked-in effect due to their production loans. Loans force them to prioritize selling the harvest to the wholesaler-financiers to pay off the debt (suki system). Since farmers are paying off loans through harvests, their bargaining capacity is reduced and the need to monitor wholesalers is eliminated. In our findings, a trade-off in terms of low transaction costs and locked-in situation is observed within the wholesaler-based governance structure.

Still in Chapter 6, a framework that determines the efficient alignment of contracts to governance structures based on transaction attributes was developed. The framework showed that commissioner governance is best conducted using classical market-based contracts. Wholesaler governance is better off conducted under neo-classical contracts while contractor governance are optimally conducted using long term contracts. It appears that surviving governance structures in the system already minimizes on transaction costs. The three governance structures are already by themselves in a transaction-cost reducing state because they are using the most optimal contract types that suit their transaction characteristics.

Moreover, transaction analysis says that among the three, the most cost-minimizing alignment of governance structures and transaction attributes is a neoclassical contract between farmers and wholesalers. However, we know that a trade-off between transaction costs and *locked-in* effects is observed in the wholesaler-based governance structure. The lowered transaction costs stem from farmers caught in a *locked-in* situation because of loan agreements and not purely from the way the wholesaler transaction was organized.

Analysis and testing of the models in **Chapter 7** showed that the decision-making of farmers was influenced by their inherent social capital. From combining social capital results of Chapter 5 with econometric modeling in Chapter 7, it can be derived that social relations and culture play an important role in economic transactions. Results from both chapters show that ethnicity is a significant factor that influences trust, volunteerism and social networking as well as trading partner selection. Hence, the critical role of social factors in the behaviour of the market and its participants deserves scientific research and should not be ignored.

More specifically, test results showed evidence that farmers with low social capital choose governance structures differently compared to farmers with high social capital. For example, among farmers with low social capital, farm-to-market distance, land ownership, and an experience of delayed payment did not play any role in their selection process but had profound effects on the selection process of high social capital farmers. On the other hand, farmers with high social capital did not consider their need for credit, knowledge of vegetable prices, vehicle ownership, institutional trust and presence of off farm income sources in their choice of governance structures but these variables had substantial effects on the selection process of low social capital farmers.

There were two remaining interesting results. First, age and the perception that traders withhold information had no significant consequence in the selection process of

farmers. Second, for all farmers, regardless of social capital, the farmers' Kankanaey ethnicity and the opinion that farmers withhold information from traders had *similar effects* on decision making of respondents.

Most of the determinants of the choice of governance structure seem to switch only between the selection of commissioners and wholesalers. The determinants for the choice of contractors, if significant, do not show any appreciable effect on the selection of either commissioner or wholesaler.

In summary, by including social capital in the model, the analysis was able understand the reasons why farmers prefer to use certain governance structures instead of the alternative. Empirical tests point to the evidence that not only farm and farmer characteristics but transaction attributes (such as farmers need for agricultural credit and means of production and an experience of delayed payment) and social capital are critical factors used by farmers in their decision-making. Results suggest that social interaction and culture provide additional explanations behind the favoured-buyer marketing arrangements in provincial vegetable trade and that various levels of social capital make a difference in the way farmers select governance structures. The results confirm that that bringing in elements such as social capital and culture in institutional economic analysis yields richer results in the explanation of behaviour of the market and its participants.

The model was able to explain the reasons why farmers prefer to use certain governance structures instead of others. Through the model we showed evidence that not only farm attributes, farmer characteristics and transaction attributes but social capital as well are important factors used by farmers in choosing governance structures.

8.3 Conclusions on feasible development strategies

Throughout this research we were able to identify and understand several constraints hindering the development of Benguet's vegetable sector. In *Chapter 1* we mentioned that once such constraints are recognized, development strategies that are locally guided can be created. However, drawing policy recommendations from research is a difficult undertaking. Complications are sure to arise once results from a scientifically-based study are applied to a political and institutional reality (see Escobal, 2005: 209 and Fafchamps, 2004). In this section strategic options for development, which stem from results of the research described in this thesis, are presented. In presenting the recommendations, the approach taken up by the thesis is to direct strategies towards the most limiting factors of development of the vegetable sector.

The integrated framework and the approach that was developed in *Chapter 2* were able to shed more light on the status of agricultural production in the country. With regards to the agro-ecologic constraints, our findings point to two things: the need to address several aspects of production, and the need to reduce production costs.

Structure analysis from *Chapter 4* shows that almost 80% of the Benguet land area belongs to slopes of 50% and above. Vegetable farms in Benguet are becoming smaller and more fragmented. The dual structure in farm land distribution in the

province becomes more distinct. *Conduct* analysis shows that intensive land use and the sloping terrain in the province lead to a quick loss in soil fertility. Traditional farming techniques and rain-fed irrigation are some features that characterize vegetable production in Benguet.

The challenge of intensive cropping and low fertility reiterates the importance of continuing and strengthening government-led programs that specifically address these issues. The two programs were mentioned in Section 4.5 of the thesis. The on-going "Soils and Water Conservation Project" as well as the "Sloping Agricultural Land Technology" programs of the Department of Agriculture are primary proponents that identify soil and water interventions that are feasible in the context of the province's limited resources. Results from Chapter 4 also show that strategies that aim to break the cycle of high chemical and fertilizer application could be undertaken. In the long run, the technologies should also work towards decreasing production costs through low cost seed varieties as well as cheaper fertilizers and chemicals.

Problems arise from the distance of municipalities and difficulties encountered by growers in transporting crops to the two trading posts. The province also suffers from poor or lacking infrastructure that supports commercial agriculture. Chapter 4 of the thesis points to a need to invest in the repair and construction of good farm-to-market roads and bridges in the province in order to minimize transportation costs and post harvest losses. This result is mirrored by the findings of Escobal (2005 :118-120) regarding potato farmers in rural Peru. Using empirics, Escobal argued that public infrastructure in the form of motorized farm-to-market tracks helps reduce transaction costs, in particular, the costs it takes to reach and establish transaction in physical markets. In addition, connecting small rural farmers to market-road networks increases farmer's bargaining power as more merchants come to farm gate to ask for produce, speeds up price and market information dissemination, and ease farmers' monitoring costs of the trading partner's transaction compliance. Fan and Chan-Kang (2004: 442) contend that investing in rural roads are powerful investments that promote rural growth and poverty reduction. Investments in the repair and construction of roads have significant productivity impacts in both irrigated and rain-fed production environments (*ibid*: 435).

The presence of only two major vegetable trading points in the province stresses the need to focus on the establishment of *functioning* satellite markets in rural areas. This could shorten not only transportation time but also the length of the marketing channel, particularly for vegetables that come from remote municipalities.

Foreign or locally led investments in post harvest facilities in rural areas that would add value to the vegetables while they are still at the farm-level is another option. Provincially-applicable cold-storage technology needs to be explored to prevent losses due to crop decomposition. The trading posts in La Trinidad and Baguio need to be rehabilitated and enlarged to properly accommodate the increasing number of traders, farmers and harvests. Such investments should not be viewed as "lost money" on the funding institution's perspective. Study results of Fan and Chan-Kang (*ibid:* 442) in India and China showed that investments in poorer agricultural areas seem to give higher marginal returns than similar investments in high potential areas. The authors cite underinvestment in poorer areas and high investment levels in better areas as the cause of the unanticipated investment returns.

With regards to the socio-economic constraints, we can identify some solutions that respond to the conditions of the province.

Based on social capital results of *Chapter 5*, it is economically (and of course, socially) favourable in the long run if the municipal and provincial government formulate policy interventions that generally increase the social capital of the population. Opportunities for interaction could begin by organizing municipal-level activities that require cooperation and collective action. Examples are town fiestas, municipal-wide group-based contests, seminars and conferences and informal social gatherings. As argued earlier, creating opportunities for interaction, to increase the bonding (internal within the acknowledged group) and bridging (external to the acknowledged group) levels of social capital, allow the people to reap the benefits of having high levels of associatedness and trust. What are the benefits of higher social capital for people involved in vegetable production and marketing? Having denser social networks have been known to improve productivity, increase efficiency and information transfer, reduce opportunistic behaviour, reduce transaction costs and lead to an overall improvement in economic performance (Arrow, 1999; Putnam, 1993; Solow, 1999; Fukuyama, 1995; Williamson, 1985 and Beugelsdijk and Schaik, 2001).

One way to increase bonding social capital and at the same time offer a solution to the problems brought about by the informal credit system, is for the municipal agricultural officers (MAO) and concerned farmers (and traders') groups to lead the strengthening of cooperative organization in Benguet. The function of cooperatives as a medium for informal gathering and infrequent knowledge exchange should be broadened towards cooperatives as centers for information transfer on production and marketing topics as well as catalysts for countervailing power among farmers.

Research results of *Chapter 6* signal the need of transacting parties to pay more attention to, and address, attributes of transactions that create high transaction costs. Commissioners are the most commonly used trader-types but the organization suffers from high monitoring and enforcement costs stemming from uncertainty. If we assume that farmers will act consistently in their choice of transacting partners as tested in *Chapter 7*, then a more efficient manner to supervise the partner needs to be agreed upon by participants under commissioner-based governance.

Results from the same chapter clarifies the reason behind low transaction costs involved with wholesaler governance and highlights the state of the agricultural credit system of the country. As mentioned earlier, agricultural cooperatives should be directed by stakeholders (with the help of Municipal Agricultural Officers and the municipal government) to function more than being an arena for meeting people but serve as farmers' sources for means of production, agricultural funds, as well as provide bargaining power against traders. The organization should create opportunities that increase farmers' involvement and sense of responsibility as a member of the agricultural cooperatives.

Overall study results indicate a long-run need of the local and regional government to focus on human resource development in the province. There is a need to pay more attention to increased opportunities of the local population to have off-farm income. Chapter 4 and Chapter 7 show that most of the respondents of the study have no other

income sources outside of agriculture. In cases of over production or when imported vegetables flood the market and push market prices down or when agriculture becomes unprofitable, livelihood alternatives outside of agriculture should be a feasible option. In the long run, education is important to allow the population options in cases when agriculture becomes unprofitable. Chapter 5 showed that higher educated people exhibit more (general) trust and institutional trust than lower educated people. Therefore, investing in affordable and appropriate educational opportunities for the population also brings about benefits for the social capital of the province. Moreover, Fan and Chan-Kang (2004: 442) add that alongside investments in roads and agricultural research, the provision of education is also one of the most powerful investments furthering economic growth in rural areas and reducing penury.

8.4 Limitations of the study and further research

Although the original intention was to focus on output markets, a valuable consequence of using the integrated *Economics of Institutions* and *Structure-Conduct-Performance* (SCP) framework was the close attention we paid to the input situation. For instance, the research helped realize that the agricultural credit system in the province is underdeveloped and incapable to serve the financial needs of growers[25]. This pushes farmers into a *locked-in* situation and in the perpetuation of the *suki* patronage system. There is a need to conduct feasibility studies on establishing a well-functioning province-wide microfinance system that does not require voluminous and time-consuming documentation.

A problem with regards to gathering accurate monetary data among farmer and trader respondents was encountered during the interview process. In particular, cost the respondents' estimates were suspected to be flawed. Therefore, income estimations that showed that 43% of the farmers and 4% of the traders were incurring negative incomes from farm-based work may not reflect the real situation in the province. The cost categorization scheme that was adopted by the study was not able to fully remedy the situation. With regards to gathering cost and for that matter, other financial data from rural respondents, an important learning experience of the study is to strictly specify the observation framework (seasonal or on a yearly basis) that is covered by the research. Restricting or grouping cost may require farmers and traders to take more time in order to answer the question because of their lack of bookkeeping records but in the end but will improve data collection and subsequently, generate reliable results for this type of information.

Social capital and transaction cost economics undoubtedly belong among the backbones of this thesis. The lack of social capital information of the province compelled the research to structure its own baseline social capital information gathering. Fortunately, social capital research in developed countries and less developed areas were able to provide ideas on the critical questions that needed to be asked. With regards to measurement issues, further research can take up multiplicative techniques as proposed by Narayan and Pritchett (1999) or comparative analysis as conducted by Putnam (1993). Looking back, we now know that the social capital of the province has more facets unique to the culture of the people and that this

[25] Put in another way around, the system that formal credit institutions in the province follow is not aligned to work with the means and resources local farmers have, making it difficult for growers to obtain loans.

merits further research. It will be an important addition to the expansion of the theory of social capital if social capital can be modeled within the framework of the economic growth of Benguet as a less favoured area. Moreover, social capital research in the region would achieve more meaning if it was viewed in a longitudinal and not from a cross-sectional perspective. Therefore a long-term effort in measuring social capital in the province is suggested. In this way, social capital elements that deteriorate can be targeted and the success of municipal level efforts at building social capital can be measured.

Measuring transaction costs is not without its own set of problems. The research relied on a combination of empirical and theoretical reasoning to analyse the transaction attributes and costs of governance structures. Looking back, it was found out that because of the activities involved within the transactions of the different modes of organization, there are several marketing practices that we could have used to directly and indirectly calculate transaction costs. A contribution to the existing body of transaction cost literature could be in the form of estimating the monetary equivalent or effect of transaction costs in vegetable exchange in the province. This approach is likened to the methodology developed by Escobal (2004) when he estimated the impact of public infrastructure investments on lowering transaction costs in rural Peru.

Although the research focused on the vegetable sector of Benguet, the results of the study are useful in guiding the three levels of government – municipal, provincial and national - in terms of policy discussions regarding tailored agricultural development. The current methodological and theoretical limitations of this thesis could be initial points for future researches in the province, particularly those that use new institutional economics approach. A challenge for future researches in the agricultural sector of Benguet province would be incorporating social capital, social interaction and culture and their subsequent influence on market behaviour, as part of institutional economic analysis. Such analysis could investigate topics ranging from ethnic diversity and market incomes, the effect of on-farm income on happiness and welfare, degree of reciprocity, trust and distrust in transaction relations as well as hierarchies, misconceptions and dynamics of local structural social capital formation. A review of marginal returns to provincial investments could provide guidelines for policy makers with regards to investment allocation strategies. What has not been achieved for Benguet yet are studies that model provincial economic growth with factors such as investments, gender, ethnicity, and other province-specific variables.

An issue that transcends local culture and formal institutional environment is the highly debated *ancestral domains* versus *government-owned* agricultural land areas. Furthermore, customary land law and the traditional inheritance rules as institutionalised land distribution arrangements among villages in northern Philippines - in the light of a burgeoning population and dwindling land resources - deserves empirical research. Research on the topics suggested will contribute to a better understanding of the institutional environment of the agricultural sector at the same time enrich literature on complex social capital of the province.

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Summary

Benguet province is located in the northern part of the Philippines along the Cordillera mountain ranges. Over 30% of the population of the mainly agriculture-dependent province live in poverty. The province is termed "Less Favoured" because of several man-made and natural resource constraints that hinder its economic growth.

In this research, we developed an integrated framework analyzing vegetable production and marketing in the province of Benguet. The framework combines Williamson's *Economics of Institutions* paradigm (2000: 597) with *Structure-Conduct-Performance* (SCP) approach. For analysis on the first institutional level - the social embeddedness –Social Capital theory was used. The formal and informal rules of the Institutional Environment as well as the *Structure* part of the SCP approach are combined at the second institutional level. On this level, the institutional environment as well as the structural characteristics of farms that are concerned with vegetable production and marketing are analysed. At the third institutional level of the developed framework, the *Conduct* part of the SCP is incorporated in the analysis of governance structures. The *Performance* part of the SCP approach is integrated at the fourth institutional level concerning resource allocation.

Since commercial crop production and a unique indigenous culture characterise northern Philippines, the institutional economics approach – one that recognizes the importance of social- alongside economic-analysis - is the ideal framework for the research. Each institutional level is addressed in the subsequent chapters of the thesis. Primary data sources for the research come from a survey of 450 vegetable growers and 195 traders from seven municipalities of the province of Benguet. The survey was conducted in 2003.

Results from analysis at the Social Embeddedness level (**Level 1**) show that social capital - as aggregated from scores on trust, associatedness, common goals and optimism, - is low for farmers and traders as a group. Farmers have significantly lower social capital than traders, the difference stems from the higher rate of trader membership in formal community organizations. For farmers and traders, social capital is more manifested in the form of common community goals and associatedness/informal networks and less in the form of trust.

The municipality of Atok and Buguias have a significantly higher social capital than the other five municipalities that were included in the study. The municipality of Bokod had significantly lower social capital than the average of all municipalities in the research.

Analysis showed that women are happier with their lives than men, and that higher educated people exhibit more trust than lower educated people. Moreover results show that religious people volunteer more and participate more in community activities, trust the local government more, foster better community relationships and are more happy and satisfied with their lives than non-religious people. With respect to age, the youth are less active in religious organizations, neighbourhood groups and in farmer cooperatives. Compared to older people, younger people were also less

inclined to socialize with other farmers. Ethnicity influences local community relations in a profound manner.

From research results it appears that ethnicity negatively influences trust towards local authorities, local community participation and volunteer work. However, membership in trader associations is positively correlated with ethnicity. In short, culture, as manifested through ethnicity, influences how members of an ethnic group participate in formal and informal social organizations.

The relatively low levels of social capital resulted in the encouragement and continuation of the favoured-buyer system (*suki*) that limits marketing possibilities for farmers and traders. Relatively low solidarity among farmers resulted in low countervailing leverage of agricultural cooperatives in marketing crops. The relatively low level of trust between growers and traders offers no fruitful basis for the conduct of market transactions with low transaction costs. Informal social networks between and among farmers and traders are not adapted towards facilitating transactions; in particular, information about prices and markets.

Analysis of the Institutional Environment and *Structure* (**Level 2**) was carried out. The *suki* or favoured buyer system evolved into an institution in vegetable trading in northern Philippines. Farmers and traders use this patronage practice to obtain better transaction terms. On the other hand, the formal institutional environment is oriented on policies that address fees and proper decorum in the trading centres but are weak on policies that address critical issues such as opportunistic behaviour, price fluctuations and disagreements between farmer and trader.

The total area of arable lands increased from 1980 to 2002 while farm size showed a tendency towards fragmentation in the same time period. A total of 60% of the total arable area are farms which were less than three hectares in size; leading to an observation of a dualistic structure in the distribution of farm size. There is a high level (71%) of land ownership among farmers.

Based on the type of crop planted, vegetable production and marketing in the province follow Von Thünen's theory of location. Higher value crops and those that are relatively more perishable and are more expensive to transport - are planted nearer to the centres, where land is small, highly fragmented and incurs higher land rent. Lower value crops and those that are relatively more storable, less perishable and are cheaper to transport from the farm to the market - are planted province-wide, although there is evidence from the survey that more remote municipalities focus production of lower value crops.

Level 3 is the level of Governance Structure and the *Conduct* component of SCP approach. Farming structure is characterised by many small farms and intensive land use. Intensive farming using traditional farming techniques, soil erosion, low soil fertility and heavy dependence on fertilizers and chemicals typify crop production in the province. Production costs are high. There is a chronic lack of market information among farmers and it appears that the methods that government agencies use to disseminate price and market information are inadequate.

The study shows that growers choose from three trading partners and their governance structures for marketing harvests; these are commissioners, wholesalers and contractors. Commissioners and the governance structures they represent are the most common marketing arrangements in trading posts, followed by wholesalers and then, contractors.

In commissioner-based governance, vegetable prices are the main coordinating mechanism (between farmers and commissioners) and party identities are irrelevant. Commissioner arrangements are highly vulnerable to fluctuating market prices. Commissioners mediate for almost any crop, although the research indicates that they have a tendency to sell lower value crops. Farmer-commissioner transactions are characterized by low asset specificity, low frequency and relatively high uncertainty. Due to the transaction attributes of low search costs, moderate negotiation costs and high monitoring costs, the governance structure incurs moderate total transaction costs. The arrangements within commissioner-based governance structure have characteristics of classical contracts.

In wholesaler-based governance price is an important coordinating mechanism, although not the only one, and sometimes not the most important one. Relative to the commissioner-based governance, the importance of identities of transacting parties begins to increase because of the provision of means of production and agricultural credit. Transacting parties have mutual interests. Wholesalers mediate also for almost any crop, although survey results show they have a tendency to mediate for mid-value vegetables.

The high production costs mentioned earlier impel 46% of the farmers interviewed to approach wholesalers for agricultural loans. Farmers who avail of agricultural credit from wholesalers may find themselves in a *locked-in* situation where they need to prioritize selling their harvests to wholesalers in order to repay their debts. However, wholesalers buying offers are less flexible relative to the other two governance structures. This result in transaction attributes of moderate search costs, low negotiation costs and low monitoring costs. Farmer-wholesaler transactions are characterized by moderate asset specificity, moderate frequency and moderate uncertainty. The arrangements within wholesaler-based governance structure have characteristics of neo-classical contracts.

With contractors, prices are determined while the crops are still un-harvested in the farm. Contractors, through hired labourers, take over harvest and farm-to-market transportation activities from farmers. This means that the lower buying prices they offer are compensated by taking over the harvest and transportation expenses and with that, takes over the risks for farmers. Contractor-based governance makes use of mostly long-term and relational contracts that are repeated over time. In this governance structure, the mutual adjustment and relation-building are important coordinating mechanisms that work behind the relationship of transacting parties. Party identities are highly relevant because exchange is recurrent. Trust leads the two parties to work together and adapt themselves to each other's interests. This has a lowering effect on the uncertainty component of transactions but increases negotiation (communication) time. Results show that contractors tend to specialize in marketing high value crops which are mostly planted in communities near the trading posts.

Farmer-contractor transactions are characterized by high asset specificity, high frequency and low uncertainty. Attributes of moderate search costs, high negotiation costs and moderate monitoring costs makes the governance structure incur the highest total transaction costs. The arrangements within contractor-based governance structure have characteristics of long-term and relational contracts.

From a transaction costs point-of-view, wholesaler-based governance incurs the least transaction costs. Note however, that a trade-off in terms of low transaction costs and *locked-in* situation is observed within the wholesaler-based governance structure.

We decided to combine social capital results with governance structure findings. In particular, we investigated whether social capital has an influence on the decision of growers to choose a certain governance structure for marketing their crops. We distinguished two groups: farmers with low levels of social capital and farmers with high levels of social capital. From the multinomial logit analysis it appears that the variables of distance to trading centre, land ownership, and an experience of delayed payment did not play any role in their selection process. However, these variables had clear effects on the selection process of high social capital farmers. Specific only to high social capital farmers, need for credit, knowledge of vegetable prices, vehicle ownership, institutional trust and presence of off-farm income sources did not influence farmer choice of trading partners. However, these variables had substantial effects on the selection process of low social capital farmers. The variables age and the perception that traders withhold critical market information had no consequence whatsoever in the selection process of both groups. The farmers' Kankanaey ethnicity and the opinion that farmers also withhold critical information from traders had similar effects on decision making for all farmers.

The developed multinomial logit model is able to explain farmers' preference for a specific governance structure. Through the model we showed evidence that not only farm attributes, farmer characteristics and transaction attributes but social capital as well are important factors used by farmers in choosing trading partners. Moreover, the model was able to confirm that social capital provides additional explanations behind the favoured-buyer marketing arrangements in provincial vegetable trade and that various levels of social capital make a difference in the way farmers select governance structures.

At **Level 4** are Resource Allocation and the *Performance* component of SCP approach. For analysis at Level 4, vegetable quantities, prices, sales, costs and incomes were studied. Farmers and traders of Benguet have big variations in sales, costs and incomes.

We decided to focus on sales analysis after having difficulties obtaining reliable cost data from respondents. A clear distinction was observed in total sales among farmers: almost 70% of the farmers had only 30% of the total sales while 13% of the farmers obtained 42% of total market sales. The duality of sales distribution among farmers supports the initial observation of the duality of the farm structure in the region. Duality in terms of total sales was also observed among traders. However, the dual structure among farmers in terms of sales is more pronounced than the dual structure among traders.

Margin analysis shows that average farm price is normally at 66% of the retail price for the medium grade potato, cabbage or carrots. However, it was observed in La Trinidad vegetable markets that it is customary for farmers to provide traders with a complimentary additional 10 kilograms of vegetables per 50-kg basket of vegetables sold. This traditional act of goodwill towards traders effectively lowers margins on the side of the farmers by 20%. Independent sample t-tests were conducted to evaluate if offer prices that farmers receive from each governance structure are significantly different from the other. Results showed that for low value crops, buying prices among the three governance structures are not significantly different from each other. However, contractors tended to offer lower buying prices for low value crops relative to the other two trader types. For high value crops, contractors have a tendency to offer higher buying prices relative to the other governance structure, in particular, for lettuce.

The integrated frameworks developed in this dissertation, consisting of the informal and formal rules of the institutional environment, the governance structures, resource allocation, and the Structure, Conduct and Performance of the vegetable sector, is a valuable instrument for institutional economic analysis. As with every level of the framework, the Benguet vegetable sector is a work in progress. With the help of the knowledge gathered in this thesis, institutional adjustments can be tailored towards addressing the *weaknesses of* and *threats to* the vegetable sector. This thesis shows that bringing in social elements such as social capital and culture in institutional economic analysis yields richer results in the explanation of behaviour of the market and its participants.

The research shows that the vegetable sector of Benguet is vulnerable and has to deal with a lot of difficulties. This situation has considerable consequences for the living conditions and the economy of the province. However, the history and culture of the people of Benguet as well as the important role of the province in providing vegetable supply to the country states that giving up traditional vegetable farming altogether is not an option. Giving up would mean the short term loss of livelihood for a considerable part of the provincial population.

The question now is; which possibilities are available to improve the income situation and raise the welfare in the province? From the research, several feasible alternatives are available. First of all, investments in infrastructure and transport can lower transport costs and post harvest losses. This conforms to the theory of Von Thünen. Secondly, a better method is needed for collecting and disseminating production and market related information in order to lower transaction costs. Thirdly, the farmers should use agriculture cooperatives for credit, means of production, and trade, to increase achieve increased countervailing power in the market. Such cooperatives can bring an end to the *locked-in* situations. Fourthly, to increase social capital people should be encouraged by the municipal-level agencies to actively participate in all development and social activities. Similarly, there is a need to focus on human resource development in the long run in order to increase off-farm work opportunities for people in agriculture. Education can deliver this important contribution.

Analysis of barriers to efficiency and competitiveness showed several problems in the agricultural sector: high production costs due to expensive seeds, fertilizers and chemicals; lack of proper farm machines; limited access to production capital;

transportation difficulties; concentration of provincial trading within two markets. A few targeted strategies were suggested in order to direct the sector towards increased competitiveness. These include diversification of production into higher value produce, organic vegetables, ornamentals or high value crops and move towards mode demand-driven production.

Finally we name some possibilities which can be indirectly conducted from the research. For increasing the efficiency and competitiveness of the sector it is necessary that better should seeds be available, farmer are trained in the use of modern technologies, direct sale between farmer institutional buyers become possible. As long as the profitability of the current production, method of cultivation and marketing structure will be the same, the farmers could strive for diversification, growing high value products, such organic vegetables, flowers and ornamentals. Furthermore they could try to find a job outside the agriculture to support their income. This can also lead to an improvement of farm size structure. However, education would be an important pre-condition.

Samenvatting (Summary in Dutch)

De provincie Benguet is gelegen in het noorden van de Filippijnen langs de bergketen van Conderillera. Meer dan 30 % van de - hoofdzakelijk van landbouw afhankelijke - bevolking in deze provincie leeft onder de armoedegrens. Omdat verschillende menselijke en natuurlijke omstandigheden de economische groei belemmeren wordt de provincie wel beschouwd als een 'less favoured area'.

In dit onderzoek hebben we een raamwerk ontwikkeld voor het analyseren van de productie en afzet van groenten in de provincie Benquet. Het raamwerk combineert de analyse op basis van de vier niveaus van instituties van Williamson (2000: 597) met de *structure-conduct-performance* (SCP) benadering. Door deze gecombineerde benadering kan recht worden gedaan aan de karakteristieken van de sector groenteteelt, en de daarbijbehorende afzet, en de unieke karakteristieken van de bevolking in het noorden van de Filippijnen. Voor de analyse op het eerste niveau - de sociale inbedding - wordt gebruik gemaakt van de '*social capital'* theorie. De formele regels van institutionele omgeving bevinden zich op het tweede niveau. Op dit niveau bevindt zich ook het structuurgedeelte van de SCP-benadering. Zowel de institutionele omgeving als de structuurkenmerken van de bedrijven die zich bezig houden met de productie en afzet van groenten worden geanalyseerd. In het door ons ontwikkelde raamwerk is op het derde niveau het gedragsgedeelte van de SCP-benadering geïncorporeerd in de analyse van de governance structures. Het prestatiegedeelte van de SCP-benadering is op het vierde niveau geïntegreerd met de resource allocatie.

Het raamwerk biedt de mogelijkheid om een analyse van productie en afzet van groenten per niveau uit te voeren, waarbij gebruik wordt gemaakt verschillende onderdelen van de institutionele economie en de SCP-benadering. Het basismateriaal voor het onderzoek is afkomstig van een enquête onder 450 groentetelers and 195 handelaren uit zeven gemeenten van de provincie Benquet. De enquête is uitgevoerd in 2003.

Uit de resultaten van analyse van de sociale inbedding (niveau 1) bleek dat het *social capital* - geaggregeerd als scores voor vertrouwen, aangesloten bij verenigingen, gemeenschappelijke doelen en optimisme - voor de groentetelers en handelaren tezamen laag is. De groentetelers hebben significant lager *social capital* dan de handelaren. Groentetelers hebben significant betere relaties in de locale gemeenschap dan de handelaren. Daarentegen zijn handelaren meer lid van formele organisaties. Op basis daarvan is hun algehele *social capital* index hoger. Voor zowel groentetelers als handelaren manifesteert *social capital* zich meer in de vorm van gemeenschappelijke doelen en informeel netwerken, en beduidend minder in de vorm van vertrouwen.

De locale gemeenschappen van Atok en Buguias hebben een significant hogere score voor *social capital* dan de vijf andere locale gemeenschappen uit dit onderzoek. Bokod had significant lager scores voor *social capital* dan het gemiddelde van alle in het onderzoek betrokken locale gemeenschappen.

Uit de studie komt naar voren dat vrouwen gelukkiger zijn met hun leven dan mannen, en dat hogere opgeleide mensen meer vertrouwen hebben dan lager opgeleiden. Voorts blijkt uit de resultaten dat religieuze mensen meer vrijwilligerwerk doen, meer participeren in activiteiten in de lokale gemeenschap, meer vertrouwen in de lokale overheid hebben, beter relaties binnen de lokale gemeenschap onderhouden, gelukkiger en meer tevreden met hun leven zijn dan niet-religieuze mensen. Ten opzichte van ouderen zijn jongeren minder actief in religieuze organisaties, buurtgenootschappen en in landbouwcoöperaties. Vergeleken met de ouderen gaan zijn ook minder om met andere groentetelers.

Etniciteit beïnvloedt de relaties binnen de lokale gemeenschap op een ingrijpende manier. Uit de resultaten blijkt dat het vertrouwen in de lokale overheid, participatie in de lokale gemeenschap en vrijwilligerswerk, negatief door etniciteit wordt beïnvloed. Lidmaatschap van handelarenorganisaties en het omgaan met andere handelaren vertoont een positieve correlatie met etniciteit. Dit betekent dat de cultuur, zoals die tot uiting komt door etniciteit, van invloed is op hoe leden van een etnische groep participeren in formele en informele organisaties in een samenleving.

Het relatieve lage niveau van *social capital* heeft het ontstaan en instandhouden van een voor kopers aantrekkelijk afzetsysteem in de hand gewerkt. Dit systeem werkt echter thans belemmend op de afzetmogelijkheden voor groentetelers en -handelaren. De relatief geringe onderlinge solidariteit leidde tot het falen van landbouwcoöperaties om telers meer onderhandelingsmacht te geven bij het afzetten van hun producten. Het relatief lage niveau van vertrouwen tussen telers en handelaren biedt geen vruchtbare basis voor het uitvoeren van markttransacties tegen lage transactiekosten. De uitgebreide en soms zelfs intensieve informele sociale netwerken zijn niet toegesneden op het adequate faciliteren van transacties, waaronder het uitwisselen van informatie over prijzen en markten.

Een uitvoerige analyse is uitgevoerd van de institutionele omgeving en de structuuraspecten, niveau 2. Het informele afzetsysteem *(suki),* ontstaan door jarenlange traditionele marketingpraktijken, belemmert thans een efficiënte handel en afzet. De formele institutionele omgeving is vooral georiënteerd op een beleid dat zich richt op tarieven en een passend decorum in de handelscentra, maar nauwelijks op een beleid dat gericht op het beperken van opportunistisch gedrag, prijsfluctuaties, en meningsverschillen tussen telers en handelaren.

In de periode 1980- 2002 nam het totale areaal groenten toe. Dit ging gepaard met een verdergaande fragmentatie in het grondgebruik. Ongeveer 60 % van het totale areaal is in gebruik bij groentetelers met een bedrijfsoppervlakte van minder dan 3 ha. De bedrijfsgroottestructuur van de telers kan, gelet op hun bedrijfsomvang in ha karakteriseerd worden als een duale structuur. Aan de ene kant zijn zeer veel kleine telers die tezamen slechts een klein deel van het areaal hebben, terwijl aan de andere kant er een gering aantal telers zijn die tezamen over een groot gedeelte van het areaal beschikken. Ongeveer 71 % van de grond is in eigendom bij de groentetelers.

Het type gewas, de groenteproductie en gebruikte governance structure sluiten aan bij de locatietheorie van Von Thünen. Hoogwaardiger en bederfelijke producten worden dichter bij centra geteeld. De kavels zijn daar klein, sterk gefragmenteerd en de grondrente is hoog. Laagwaardiger producten worden meer verspreid door de

provincie geteeld. Uit de survey blijkt voorts dat de meer verafgelegen gemeenschappen zich meer richten op bewaarbare en dus minder bederfelijke producten.

Niveau 3 is niveau van de governance structure en van de gedragscomponent van SCP- benadering. De bedrijfsgroottestructuur - zoals gezegd gekenmerkt door relatief veel kleine bedrijven - leidt tot een intensief grondgebruik. De groenteteelt maakt intensief gebruik van kunstmest en gewasbeschermingsmiddelen. De intensieve productiewijze leidt enerzijds tot milieuproblemen, enerzijds brengt ze de behoefte aan krediet en productiemiddelen met zich mee. De intensieve productiewijze leidt ook tot relatief hoge productiekosten. Om de telers te ondersteunen treden de handelaren - en dan voor al de groothandelaren - dikwijls ook op als leverancier van productiemiddelen en kredietverschaffers. Voorts is er onder de groentetelers een chronisch gebrek aan goede markinformatie. De methoden die overheidsdiensten gebruiken om informatie over teeltmethoden, prijzen en afzetmogelijkheden te verspreiden schieten tekort.

Uit het onderzoek komt naar voren dat de telers gebruik maken van drie governance structures voor de afzet van hun producten. Deze kunnen kortweg aangeduid worden als *commissionairs*, *groothandelaren* en *contractanten.* Van de commissionairs wordt het meeste gebruik gemaakt, gevolgd door de groothandelaren. De contractanten hebben het kleinste aandeel.

Commissionairs zoeken naar kopers voor het product van de teler. Dit zoekproces moet leiden tot een hogere prijs. Binnen deze governance structure is de prijs voor de groente het belangrijkste coördinatiemechanisme en de identiteit van de partijen is nauwelijks van belang. Dit arrangement is echter in hoge mate gevoelig voor fluctuerende marktprijzen. De commissionairs bemiddelen voor bijna alle producten, hoewel uit het onderzoek een voorkeur blijkt voor laagwaardiger producten. Teler-commissionair transacties worden gekenmerkt door een lage *asset specificiteit*, lage frequentie, en relatief hoge onzekerheid. Als gevolg van de transactieattributen lage zoekkosten, gematigde onderhandelingskosten en hoge monitoringskosten leidt het gebruik van deze governance structure tot gematigde totale transactiekosten. De totale transactiekosten die met de afzet via deze governance structure gepaard gaan liggen tussen die van de twee andere governance structures in. De arrangementen binnen de commissionair-governance structure het karakter van een klassiek contract.

In governance structure teler-groothandelaar zijn verschillende mechanismen die de acties van de partijen coördineren. De prijs voor de groente is een belangrijk coördinatiemechanisme in deze relatie, zij het niet de enige en soms zelfs niet de belangrijkste. De identiteit van de partijen doet er ook toe, en wel vanwege de voorziening van productiemiddelen en van krediet. Voorts, en dat hangt samen met de identiteit van de partijen, neemt - ten opzichte van teler-commissionair ook het belang van de persoonlijke waarborgen toe. Er is dikwijls sprake een wederzijds belang. De groothandelaren bemiddelen voor bijna alle producten, hoewel uit het onderzoek een tendens blijkt voor producten met een gemiddelde waarde. De eerder genoemde hoge productiekosten leiden er toe dat een groot aantal groentetelers (volgens de enquête 46 % van de telers) de groothandelaren benaderen voor het verstrekken van krediet. Telers die gebruik maken van krediet of productiemiddelen verstrekt door de groothandelaren zien zich zelf in een *lock-in* positie geplaatst. Zij zijn min of meer

gedwongen hun oogst aan de groothandelaren te verkopen om hun schulden terug te kunnen betalen. Telers-groothandelaren transacties worden gekenmerkt door een gematigde *asset specificiteit*, regelmatige frequentie, en gematigde onzekerheid. De totale transactiekosten die met de afzet via deze governance structure gepaard zijn lager dan die teler-commissionair governance structure. De arrangementen binnen de governance structure gebaseerd op groothandelaar hebben het karakter van een neo-klassiek contract.

Bij de commissionairs en groothandelaren zijn de prijzen voor producten op de handelsposten en bij de contractanten zijn het prijzen voor de producten op het land, d.w.z. op stam of in de grond. De contractanten zijn tevens loonwerkers en dragen zorg voor de oogst en het transport naar de stad. Dat betekent dat de lagere prijs die zij aan de telers bieden gecompenseerd wordt door overnemen van de oogst- en transportkosten en daarmee samen hangende risico's voor de telers. De **contractanten** hebben zich vooral gespecialiseerd in hoogwaardige producten en beperken zich tot producten die in de nabijheid van de handelposten worden geteeld.

Contract-gebaseerde governance structures maken veelal gebruik van lange termijn en relationele contracten, die vaak wederkerend zijn. In deze governance structure zijn wederzijdse aanpassingen en het werken aan het instandhouden van een goede lange termijnrelatie belangrijke drijvende factoren achter het gedrag van de partijen. Voor een deel functioneren deze factoren als een coördinatiemechanisme. De identiteit van de partijen is van belang omdat de transactie wederkerend is, zoals bij een spel dat zich herhaalt. Het onderlinge vertrouwen is belangrijke en ook de bereidheid om rekening te houden met elkaars belangen. Dit verlaagt de onzekerheidscomponent van de transacties maar vergroot de onderhandelingstijd.

Telers-contractanten transacties worden gekenmerkt door een hoge *asset specifiteit*, hoge frequentie, en relatief lage onzekerheid. De totale transactiekosten die met de afzet via deze governance structure gepaard gaan zijn relatief hoog, hoger dan die van de beide andere governance structures. De arrangementen binnen de governance structure gebaseerd op contractanten hebben het karakter van lange term en relationele contracten.

Zoals gezegd heeft van de drie governance structures heeft de contract-gebaseerde governance structure de hoogste transactiekosten. Dit is de resultante van twee aspecten binnen de transactiekosten. Het vertrouwen tussen teler en contractant vermindert de kosten van het zoeken naar informatie, onderhandelen, monitoring en het naleven van de overeenkomst. Dit vertrouwen leidt er toe dat de twee partijen samen werken en zich aanpassen, waarbij rekening wordt gehouden met elkaar belang. Dit heeft een positief effect op de onzekerheidscomponent van de transactiekosten. Daar staat tegenover de hogere transactiekosten als gevolg van hoge *asset specifiteit*. De groothandelaren-governance structure heeft de laagste transactiekosten. Dit is een gevolg van het lock-in effect. Tegenover het lock-in effect staat een afruil in de vorm van lagere de transactiekosten.

Om te testen of *social capital* gevolgen heeft voor de beslissing van de telers voor de keuze van de governance structure zijn twee groepen onderscheiden: telers met een laag niveau laag *social capital* en telers met een hoog niveau van *social capital*. Uit de *multinominal logit model* analyse blijkt dat de variabelen afstand tot de

handelscentra, grondeigendom, en ervaringen met te late betalingen geen rol spelen in de keuze van de governance structure voor telers met laag niveau van *social capital*. Deze variabelen hebben echter een duidelijk en significant effect bij de keuze van de telers met een hoog niveau van *social capital*. Voor de groep van telers met een hoog niveau van *social capital* heeft de behoefte aan krediet, informatie over de groenteprijzen, eigendom over een vrachtauto, institutioneel vertrouwen en de aanwezigheid van inkomen buiten het bedrijf geen invloed op keuze van de teler voor een governance structure. Deze variabelen hebben echter een substantieel effect op de keuze van de telers met een laag niveau van *social capital.*

De variabelen 'leeftijd', en de perceptie dat 'handelaren belangrijke markinformatie achter houden' hebben geen effect in het selectieproces van beide groepen. De variabelen 'leeftijd', 'telers met de Kankanaey etniciteit' en 'handelaren houden belangrijke markinformatie achter' hebben een vergelijkbaar effect op keuze van telers met een laag niveau laag *social capital* en telers met een hoog niveau van *social capital*. Dat wil zeggen zij spelen voor beide groepen geen rol in het keuzeproces voor een bepaalde governance structure.

Voor het verklaren waarom groentetelers een bepaalde governance structure prefereren is een *multinominal logit model* gebruikt. Met dit model kan worden aangetoond dat niet alleen bedrijfs-, persoonskarakteristieken, en transactie-attributen, maar ook de niveaus van social capital van belang zijn voor de keuze van de handelspartners en daarmee voor de governance structures. Bovendien bevestigde het model dat het niveau van *social capital* additionele verklaringen oplevert voor de keuze van een bepaalde governance structure en van invloed zijn op de wijze waarop groentetelers de governance structure selecteren.

Niveau 4 is het niveau van de prestatiecomponent van SCP-benadering en de resource allocatie. Voor het analyseren van niveau 4 zijn prijzen, hoeveelheden, kosten, verkopen en winsten onderzocht. De telers in Benguet vertonen een grote variaties in kosten, verkopen en winst.

Voor een meer diepgaande analyse van de prestatiecomponent waren drie mogelijkheden: de kosten, de winst of de verkopen. De gegevens over kosten en de winst bleken onvoldoende betrouwbaar voor een diepgaande analyse. Daarom is besloten om de aandacht vooral te richten op de verkochte hoeveelheden. Deze bevestigde de al eerder gesignaleerde dualiteit. Zeer veel kleine telers hebben tezamen slechts een klein deel van de productie, terwijl aan de andere kant een gering aantal telers tezamen een groot gedeelte van de productie voortbrengt. Bijna 70% van de groentetelers heeft tezamen 30 % van de totale verkopen, terwijl 13 % meer dan 40 van het verkoopvolume in handen heeft. De 'groottestructuur' in de verkoop van de handelaren vertoont een minder uitgesproken duaal karakter.

De marge-analyse laat zien dat de gemiddelde prijs op *boerderijniveau* ongeveer 66 % is van de prijs op detailhandelniveau voor aardappelen, kool en wortelen. Echter, het is dikwijls de gewoonte dat de groentetelers de handelaren een extra aanvullende hoeveelheid geven, soms wel ter grootte van 10 kg per geleverde 50 kg. Deze traditionele blijk van goodwill verlaagt de marge voor de groentetelers met 20%. Uit de studie blijkt dat de prijzen die de groentetelers van de *commissionairs*, *groothandelaren* en *contractanten* ontvangen niet significant van elkaar verschillen.

Er is een tendens dat de prijs die contractanten betalen voor laagwaardiger producten lager is dan bij de twee andere typen handelaren. Voor hoogwaardiger producten is er een tendens dat de contractanten een hogere prijs betalen dan de commissionairs en groothandelaren, in het bijzonder voor sla.

Het geïntegreerde raamwerk ontwikkeld in dit proefschrift, dat zowel *social capital*, formele regels van de institutionele omgeving, de *governance structures*, en de structuur, het gedrag en de resultaten van de groentesector omvat, blijkt een uiterst waardevol analyse-instrument te zijn. Voor zowel het raamwerk als analyse-instrument, als de groentesector in Benguet, geldt dat beide in ontwikkeling zijn. De inzichten verkregen in dit proefschrift kunnen een bijdrage leveren aan gewenste institutionele aanpassingen die noodzakelijk zijn gezien de zwakke punten van en bedreigingen voor de groenteteeltsector in Benguet.

Uit het onderzoek komt naar voren dat de groentesector van Banguet kwetsbaar is en het moeilijk heeft. Dit heeft aanzienlijk consequenties voor de levensomstandigheden en de economie van deze provincie. Gegeven de historie, de cultuur van mensen in Benguet, de gebrekkige alternatieven, en de belangrijke rol van deze provincie in het voorzien van behoefte aan groenten in de andere provincies lijkt het opgeven van de traditionele groenteteelt niet een optie. Het opgeven van de groenteteelt zou op korte termijn een verlies aan mogelijkheden voor levensonderhoud voor een aanzienlijk deel van de bevolking in Benguet betekenen.

De vraag is welke mogelijkheden zijn voorhanden om inkomensverbetering en verhoging van de welvaart in de provincie te realiseren. Uit het onderzoek zijn de volgende mogelijkheden af te leiden. Allereerst kunnen investeringen in de infrastructuur en transportmogelijkheden de transportkosten aanzienlijk doen verlagen. Dit is conform de theorie van Von Thünen. In de tweede plaats is een betere methode nodig voor het verzamelen en verspreiden van informatie over teelten, gewasverzorging, prijzen, hoeveelheden, en afzetmogelijkheden. Dit leidt tot een daling van de transactiekosten. Een vergroting aantal marktplaatsen in de provincie kan zowel de transportkosten als transactiekosten verlagen. In derde plaats zouden de telers veel meer van nut en noodzaak van landbouwcoöperaties voor krediet, aankoop productiemiddelen, verwerking en afzet, het opbouwen van marktmarkt overtuigd moeten worden. Dergelijke coöperaties zouden een eind kunnen maken aan gesignaleerde lock-in effecten. Voorst kunnen deze een bijdrage kunnen leveren aan het verbeteren van het ketenmanagement, de productie- en verpakkingstechnologie. In de vierde plaats zouden mensen meer gestimuleerd moeten worden om passief maar vooral actief deel te nemen aan maatschappelijke activiteiten en organisaties. Daarmee kan een verhoging van het *social capital* worden bewerkstelligd. In samenhang daarmee is er ook meer aandacht nodig voor de ontwikkeling van het menselijk kapitaal op de lange termijn. Scholing kan daar een belangrijke bijdrage aan leveren.

Barrières voor verbeteren van de en de concurrentiekracht zijn: de hoge productiekosten door duur zaaizaad en pootgoed, intensief gebruik van kunstmest en gewasbeschermingsmiddelen; de bedrijfsgroottestructuur; Om de concurrentiekracht van de sector te vergroten kan gebruik worden, diversificatie in de richting van meer

hoogwaardiger producten, zoals biologische geteelde groenten, bloemen en siergewassen, en een verschuiving in de richting van meer vraaggestuurde productie.

Tenslotte noemen we nog aantal mogelijkheden die zijdelings uit het onderzoek zijn af te leiden. Voor het vergroten van de efficiency en concurrentiekracht is het nodig dat er beter zaaizaad en plantgoed komt, de groentetelers getraind worden in het gebruik moderne technieken, en directe verkoop tussen groentetelers en institutionele kopers mogelijk wordt. Zolang de rentabiliteit van de huidige teelten, teeltwijzen en afzetstructuren ongewijzigd blijven kunnen de groentetelers streven naar diversificatie, het telen van hoogwaardiger producten, zoals biologische geteelde groenten, bloemen en siergewassen, Voorst kunnen zij ook proberen een baan buitenshuis te vinden om hun inkomen te ondersteunen. Dit laatst kan ook leiden tot een verbetering van de bedrijfsgroottestructuur. Daarvoor kan een verbetering van de opleiding een belangrijke voorwaarde zijn

About the Author

Aimee Milagrosa was born on 18 June 1976 in Calamba Laguna, Philippines and grew up in La Trinidad valley Benguet, in the Cordillera Region. She studied in two primary schools, eventually finishing sixth grade (with honors) in SPED Center Baguio City. In high school, she consistently excelled in academics and extra-curricular activities representing the university in various regional and national competitions. BSU Science High assigned her salutatory honors in her final graduation.

In 1993, she proceeded to the University of the Philippines in Los Baños for her Bachelors in Agricultural Economics where she majored in Farm Management and Production Economics. For her BSc thesis, she analyzed the economic viability of a local government project to increase on-farm income among farmers in La Union, Philippines. A teaching and research position in Benguet State University followed after her graduation in 1997. Aside from teaching economics to BSc students, her work involved writing project proposals and conducting researches for the Institute of Highland Policy Studies and Socio-Economic Research and Development (IHPSSERD). She was involved as an assistant project leader on a research project analyzing the economics of generated technologies for potato production in the Cordillera region, which was funded by the Department of Agriculture.

Co-writing the proposal for the Phase II of the VLIR-BSU Cooperation project allowed her to proceed to Belgium to pursue her MSc in the University of Gent, Belgium. There, she finished her Masters in Agricultural Development major in Agro-food marketing (with distinction) with her pioneering thesis on analyzing transaction costs in vegetable marketing in Benguet. She started her PhD in September 2001 in Wageningen University with the Agricultural Economics and Rural Policy Group. In 2003, she married Dirk Hampel and a year after, was blessed with a beautiful daughter named Victoria Lee. She is currently working as a Senior Researcher in the Department of Economics and Technological Change of the Center for Development Research (ZEF) of the University of Bonn, Germany.

Completed Training and Supervision Plan

AIMEE MILAGROSA
PhD student, Mansholt Graduate School (MGS)

Name of the course	Department/Institute	Year	Credits
I. General part			
Social Science Research Methods	Mansholt Graduate School	2001	1
Research Methodology: Designing and conducting a PhD research project	Mansholt Graduate School	2002	2
Techniques for writing and presenting a scientific paper	Mansholt Graduate School	2001	1
II. Mansholt-specific part			
Mansholt Introduction Course	Mansholt Graduate School	2001	1
Mansholt Multidisciplinary Seminar	Mansholt Graduate School	2001	1
Presentations at international conferences and workshops	International Seminar on Development Strategies for Less-Favoured Areas Organized by WUR and International Food Policy Research Institute (IFPRI-RESPONSE Project), The Netherlands	2002	3
	2005 Malta Conference on Social Capital The Social Capital Foundation	2005	
	International Workshop on sustainable poverty reduction in Less-Favoured Areas Organized by WUR and International Food Policy Research Institute (IFPRI-RESPONSE Project), The Netherlands	2005	
	99th EAAE Conference, Bonn	2006	
	Mansholt PhD Day and Chains and Networks Conference and Doctoral symposium, MGS-WUR, The Netherlands	2006	
	AAEA 2006 Conference, California	2006	
III. Discipline-specific part			
The Economics of Household Behaviour	NAKE	2001	2
Applied Microeconomics	NAKE	2001	4
Econometrics 1	WUR	2002	3
Advanced Econometrics	MGS-WUR	2002	3
Advanced Agricultural Marketing	WUR	2002	5
Economic Organization Theory	NAKE	2002	2
PhD Reading and Discussion Group	MGS-WUR	2002	1
NIE: Property Rights, Contracts and Transaction Costs	MGS	2004	2
Total (min. 20 credits)			**31**

Note: NAKE refers to the Netherlands Networks of Economics, EAAE refers to the European Association of Agricultural Economists, and AAEA refers to the American Agricultural Economics Association. *One credit on average is equivalent to 40 hours of course work

The RESPONSE Programme

REGIONAL FOOD SECURITY POLICIES FOR NATURAL RESOURCE MANAGEMENT AND SUSTAINABLE ECONOMIES

This research was carried out within the framework of the RESPONSE programme (Regional Food Security Policies for Sustainable Natural Resource Management and Sustainable Economies), a joint initiative of the Mansholt Graduate School for Social Sciences, CT de Wit Graduate School for Production Ecology and Resource Conservation and Wageningen Institute for Animal Sciences (WIAS) at Wageningen University and Research Centre (WUR) in cooperation with the International Food Policy Research Institute (IFPRI) in Washington D.C. The program aims at supporting policy makers in identifying alternatives for addressing poverty, food security and natural resource degradation in less-favoured areas.

RESPONSE is one of the six multi-annual research programmes of the Interdisciplinary Research and Education Fund (INREF) of Wageningen University, launched in 2000. INREF enables the cooperation of Wageningen University researchers with international and local institutions of the South. The RESPONSE programme includes 10 sandwich PhD students from East Africa (Ethiopia, Kenya and Uganda) and South East Asia (China, Bangladesh and the Philippines).