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CONTRACT FARMING: THEORY AND PRACTICE

CONTRACT FARMING
THEORY AND PRACTICE

Authored by
Erkan Rehber



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This book is dedicated to my parents and
E. Nurcan who is my life-long supporter.

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As an author, Professor Rehber has published numerous articles in professional and scientific journals and some books throughout his career. Professor Rehber has received several grants to help him in his researches. He was also a member of multiregional project (NE-165), carried out by Food Marketing Policy Center, Connecticut, USA, between 1997 and 2002. He worked abroad as a NORAD scholar in Norway for about one year, as a Fulbright scholar at the University of Connecticut for a half year and as a DAAD scholar in Giessen and Bonn Universities of Germany for four months.

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PREFACE

I have been studying vertical coordination and contract farming since 1996. The initial part of my studies was a regional project in Turkey, started in 1996. This project was later affiliated to the Regional Research Project NE-165 Private Strategies, Public Policies and Food System Performance, carried out by the Food Marketing Policy Center, in the Department of Agricultural Economics at the University of Connecticut. During this period, I had an opportunity to study this topic as a Fulbright scholar in the Center mentioned above. I have written some publications as the outcomes of my studies, some of which are in the reference list of this book.

I have observed great concern in this topic on the part of many scientists and audiences from several countries of the world through citations and requirements of reprints or copies of my studies. One of my studies entitled "Vertical integration

in agriculture and contract farming” has been placed among the most downloaded 30 papers in the USA, in a well-known searching web-site; AgEcon Search¹ in 2001. The final request was an invitation for an article from the Icfai University in India through Dr. Senthil Kumaravel. Then, they encouraged me to collect my studies in a book and publish it as a publication of Icfai University Press through Mr. Ved Prakash, faculty Associate, Icfai Books.

I have done the best I can in the time available. I do bear full responsibility for all shortcomings and omissions which inevitably occur in such a study. I hope this unpretentious book will be useful to related scholars and interested audiences.

First of all, I am really thankful to Prof. Dr. R. W. Cotterill for not only providing an excellent opportunity to study at the Food Marketing Policy Center, but also for his beneficial cooperation and encouragement from the beginning of my studies. I owe a considerable debt of gratitude to my own colleagues who helped me in my Department of Agricultural Economics. And, I would like to express my thanks to Dr. Senthil Kumaravel and Mr. Ved Prakash for their kind co-operation. Finally, my special thanks are extended to Icfai University Press (books) authorities and the editorial team for their cooperation in enabling this publication.

Prof. Dr. Erkan Rehber
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¹ Research in Agriculture and Applied Economics (<http://www.agecon.lib.umn.edu>), AERO, (Agricultural Economics Reference Organization), 2001 Report, USA.

I

Introduction

The agricultural-food system (agro-food) has been subject to major structural changes driven mainly by changes in consumer preferences and attitudes, technological improvements, food safety issues and related regulations. Globalization and liberalization efforts supported by IMF and WTO have accelerated this process. The advanced agro-food sector is considered as a chain of interrelated activities from input suppliers to consumers while the traditional view of agribusiness is considered only as activities beyond the farm-gate.

The agro-food sector can be conceptualized as a system of vertically interrelated stages. These stages are tied together through several ways and forms ranging from the sale of goods via arms length transaction agreements to consolidation of two or more stages under a common management of single firm i.e., vertical integration. Every type of relationship among these vertical stages is so called vertical coordination. In other words, vertical coordination encompasses all means of relationship among vertically interdependent production and distribution activities.

An increasing concern has been observed from related scientists on vertical coordination and contractual relationship between firms and farmers (growers). There are a considerable number of theoretical and empirical studies about contract farming and related issues. No conclusive theory yet exists, despite the availability of several theories that are used to study vertical coordination. These studies have been realized not only by economists but also by anthropologists, political economists, sociologists and even geographers.

It has been widely argued that recently agriculture is undergoing a process of closer vertical coordination with allied industries, and that consequently the control of agriculture in the future may not rest within the industry itself. The food system from farm to consumer table has traditionally operated in an open market relying on the price signals. Nowadays, however, considerable close cooperation-coordination has been observed. The most widely used method of vertical coordination is contract farming. Contract farming is used in developed countries, where it accounts for about 15% of agricultural output and also has been rapidly expanding in developing countries.

World-wide applications in practice have caused different terms and connotations regarding contract farming to appear in related literature. Different types of contract production have been observed, based on the development stage of the agricultural sector, market structure and product characteristics. In other words, contractual relationships have been practiced in different models, mostly as organized schemes by different actors in developing and less developed countries, while the private ones are appearing mainly as those between individuals or a group of farmers and private companies in the developed world.

As a means of coordination, contract production has traditionally been considered a feature of an advanced capitalist agricultural structure, but it represents an expanding and much suggested method of agro-industrial integration for developing countries and the economies in transition. Hence, contract farming has been promoted over the last decades as an institutional innovation to improve agricultural performance in less developed countries, sometimes as a key element of rural development and/or settlement projects.

These methods of vertical coordination of the advanced agro-food structure have many advantages, but are subject to some inherent and implementation problems. Success and failures or benefits and problems of contract farming are generally analyzed not only from the points of views of farmers, firms and third parties involved, but also from the national point of view. From the farmers' perspective, reduced independence and lack of market position in the more concentrated raw commodities markets are problems that require feasible, practical and fair solutions. Especially, the question of distribution of benefits between growers (farmers) and firms, which is known as "bargaining problem," requires attention. There is no doubt that contract farming will be a part of industrialized agriculture both in developed and developing countries despite some arguments against contract farming because of those problems.

This book aims to present a brief information and a short insight into related theories and implementations of contract farming to promote understanding of different aspects, implications, mechanisms, outcomes, related problems and their solutions. Apart from providing a brief history of contract farming and discussing the alternatives to contract farming, the book mainly focuses on the basic concept and theories of vertical coordination. It also reviews the world-wide implementation of contract farming besides the rather detailed information about contract farming both in Turkey

and the USA. Turkey is a developing country which has a promising food industry, while the USA is a developed country which has a heavily industrialized food system. The structure of the food industry and experiences of contract farming in the USA were investigated based on the available publications and empirical researches, while the structure of the food industry and contract farming in Turkey were studied based not only on available publications and studies, but also the empirical data obtained by field survey. This field survey was conducted in a region in Turkey where the main food processing plants are located. In the survey, 25 firms and 91 growers were interviewed. In addition, 25 examples of production contract were examined. This book also deals with the main shortcomings of contract farming focusing on the bargaining problem and related solutions, and presents a cooperative model for a successful contracting.

The book has five chapters. Chapter 1 serves as an introduction. Chapter 2 presents a short review of integration and discusses concepts and theories of vertical coordination and contract farming. The general overview of food industries and rather detailed information about contract farming both in Turkey and the USA are presented in Chapter 3. Before the conclusion placed in Chapter 5, contracting problems focusing on the bargaining problem and related solutions, brief information about bargaining cooperatives and an alternative cooperative model for successful implementation have been discussed in Chapter 4.

2

Theoretical Background

Vertical coordination and contract farming as a closer way of vertical coordination have been a major interest to scientists from different disciplines such as economists, anthropologists, political economists, sociologists and even geographers.

There are several theories that are used to study vertical coordination and no conclusive theory yet exists. Each theory focuses on different aspects, applies different explanation mechanisms and reaches different outcomes and managerial implications. The issues of vertical coordination can be easily understood and analyzed in the light of a combination of different and sometimes overlapping approaches.

Contract relationship as a way of vertical coordination is not new in agriculture dated back to the last quarter of 20th century. Theoretical approaches to contract farming and its implementation world-wide in practice have caused to appear different terms and connotations regarding contract farming in related literature.

The main objective of this chapter is to offer a glimpse of the theoretical background of contract farming. Available concepts and

theoretical approaches of vertical coordination are reviewed after a short discussion about the ways of vertical coordination in agriculture. Different concepts of contract farming that appeared in related literature are reviewed and brief information about some of the related issues of contract farming is also given.

2.1. Vertical Coordination and Agriculture

From the point of view of general system theory, there are three main ways (theories) of coordination as *hierarchies* (full or ownership integration), *markets* (open market coordination), and *networks* (cooperative and corporate coordination) (Veryard 1994). From inter- and intra-firm's point of view, it can be classified into three basic kinds of coordination (Roy 1963). *Vertical coordination (integration)* occurs when a firm combines activities unlike those it currently performs which are related to them in the sequence of marketing and production activities. Vertical coordination is related to a technological rather than an institutional development (Trifon 1959).

Such coordination could be illustrated by the meat packer who decides to reach both backward towards the producer and operate his own livestock buying points in the countryside and forward towards the consumer and operate his own meat wholesaling firm (Kilmer 1986). Integration means bringing together two or more parts into one. Vertical integration is best reserved for ownership integration where two or more stages in the process of production and marketing are effectively controlled by a single management.

Horizontal coordination (integration) occurs when a firm gains control over the firms performing similar activities at the same level in the production and marketing sequence. The local dairy cooperatives which are brought under a regional union are one example. Firms often expand both vertically and horizontally. When both horizontal and vertical operations are tied together, a *circular*

coordination occurs. For example, if an organization of dairy farmers is brought under a dairy cooperative, a vertical integration occurs; at the same time if dairy cooperatives are organized under a regional cooperative union, a horizontal integration occurs.

There is another type of organizational expansion which occurs when agencies or activities that do not have any direct relationships between them are brought under a unified management. This is called *conglomeration*.

Another way to review integration in an industry is by studying the extent of the transfer of decision and the ownership of the firm assets. The coordination that occurs when all the decisions and assets of the firms are taken under a single firm's control is called *ownership integration* or *merger*; in contrast, when each firm retains its separate identity but leaves one or more decisions of production and/or marketing to the control of another firm, it is called *quasi integration* or *contract integration*.

The terms of vertical coordination, vertical integration and contract production are sometimes used interchangeably (Cramer and Jensen 1988, Paarlberg 1995). Of course, vertical coordination is rather a broad term which encompasses all means of relationship harmonizing vertically interdependent production and marketing activities ranging from spot markets through various types of contracts to complete integration (Frank and Henderson 1992).

Primitive agriculture was a fully integrated system in itself. In subsistence agriculture, vertical integration is nearly complete since most of the production resources and production decisions are in the same hand (Penn 1958). One family could collect seed, sow and reap a crop, rear and fatten an animal, and consume the produce after reserving seed or breeding stock for the following year. The evolution from subsistence farming to the present market-oriented

agricultural system has been marked by a gradual disintegration of functions. Specialization and close coordination among those specialized units is one of the distinguishing features of commercialized agriculture.

Nowadays, agriculture as a production industry is closely related to marketing activities which transform, transport and transfer food and fiber to the consumer on one hand, and is served by a large number of industries which are supplying farm inputs on the other hand. Coordination between farms and the other firms in the industry both forward and backward is inevitable now.

An agricultural production and marketing system includes different stages or sectors: suppliers of input items, farm operators, processors of farm products, distributors, and final consumers. In the developed countries, the relationships and transactions between these sectors can be realized in different ways (Allen 1972). If we focus on the ways of vertical coordination between farmers and off-farm business, four main forms of vertical coordination are generally recognized in addition to some special or hybrid ways of coordination such as strategic alliances, joint ventures etc. (Berkama and Drabenstott 1995, Rehber 1998).

- i. **Coordination without any contract (market coordination):**
The prevalent existence of a spot market with open market transactions is known as market coordination. Spot markets or the traditional free marketing system still accounts for the lion's share of the present world marketing system. For example, according to the USDA's most recent data, about 42.5 % of agricultural products (34.5% under contracting and 8 % under full integration) are marketed through closer vertical coordination while remaining products are marketed still through open market transactions (Boland

et al. 1999). In this kind of relationship, there is no written or oral agreement between the firm and the farmer for both buying and selling.

Here, the farmer buys inputs from a supplier of his choice and sells his products to whoever will pay the best price. This type of vertical relationship provides freedom to farmers, but uncertainties both in buying supplies and selling produce are the main drawbacks. In a competitive open (free) market system, price signals control the market mechanism. The message reflected in price would be passed back to the processor from the final supply points (super markets or groceries) to the farmer and then to the supplier of input items. This system may work very slowly.

This traditional form of market organization and price determination will remain as the appropriate means of coordinating the vertical stages in a system under the conditions such as: realization of production by dispersed large number units and closeness of production to the points of final consumption; availability of government or producer organizations' control over prices and sale volumes; acceptance of lesser quality and grading by the purchaser and the existence of sound and effective extension and advisory services as government functions. For instance, contract farming has rarely existed in grain, oilseed and cotton production, which have been subject to government price and/or income support programs.

On the other hand, the historically large number of individual farms has been considered the major reason for the dominance of open markets (Barry *et al.* 1992). It can be evaluated as a clear evidence that rather a close vertical coordination has been dominant in the developed countries

which have a decrease in farm numbers and growth in size, whereas underdeveloped and developing countries, which have scattered and small farm size structures, still mainly rely on open market transactions.

Farmer contracts for delivery of a specific quantity at a specific price, time, and place (ordinary forward and futures contracts) are considered as a part of market coordination (Schrader 1986).

- ii. **Contract farming:** In contractual relationship, generally each farm retains its separate identity but leaves one or more decisions of production and/or marketing and farm assets under the control of another firm. Contract farming will be presented in detail in the later parts of this chapter.
- iii. **Vertical integration:** Vertical integration is best reserved for ownership integration where two or more stages in the process of production and marketing are effectively controlled by a single management. A firm can be described as vertically integrated if it encompasses two single-output production processes in which: the entire output of the first process is employed as part or all of the quantity of one intermediate input into a second process or the entire quantity of intermediate input into second stage is obtained from part or all of the output of the first stage. This can be called *full integration*. This description may include more restrictive criterion where the entire output of upstream process is employed as the intermediate input into the downstream process. It can be redefined as “most of the output of upstream process is employed as most of the input in the downstream process”. This case is best described as *partial vertical integration* or *taper integration* (Perry 1989). In other words, “*full integration* refers to selling all of the

outputs, or providing all inputs in-house and *taper integration* refers to selling some proportion of outputs to out of the firm or buying some inputs from outsiders” (Harrigan 1986).

Vertical integration also means the ownership and complete control over neighboring stages of production or distribution. Grossman and Hart (1986) have argued that vertical integration is the ownership and thus complete control over the assets. However, because of the different nature of the labor input, it is not relevant for vertical integration. The workers could be employees or contractors without altering the degree of vertical integration.

On the other hand, Williamson (1973) stated that vertical integration would encompass the switch from purchasing inputs to producing those inputs by hiring labor. The required capital for production, such as building and equipment, could be owned or leased without altering the degree of vertical integration. Leasing of capital can allow control of production without ownership. Vertical integration is the control over the entire production or distribution process rather than the control over any particular input into that process. Vertical integration may arise in a number of ways. *Vertical formation* describes vertical integration, which occurs at the time the firm is created. *Vertical expansion* describes vertical integration, which occurs as a result of internal growth of the firm creating its own subsidiaries of the neighboring stages. *Vertical merger* describes vertical integration, which occurs through the acquisition of one firm by the existing firm in a neighboring stage. In this type of coordination in agro-food sector, each individual farm loses its identity and becomes a company-

owned farm. The parent company owns or leases the land, buildings and equipment and employs its own employees.

- iv. **Farmer cooperatives:** An agricultural cooperative is an organization usually incorporated, owned, and controlled by agricultural producers, which operates for the mutual benefit of its members as producers or patrons (Rehber 1984). One world-wide way of vertical coordination is, of course, cooperative organization. Especially, input supply, processing and marketing cooperatives are bringing more than two and more stages of production and marketing under the control of one unit.

The farmers' participation in the cooperatives would result in easy access to available markets, enhanced net returns and countervailing power when facing anti-competitive market forces (Petraglia and Rogers 1991). By working together in their cooperatives, farmer-members can better control their destiny (Ling and Liebrant 1995). Cooperatives can offset monopsony power of processors by elevating prices in the market to competitive levels for all farmers (not only for cooperatives members).

Organizing under an agricultural cooperative or producers' group is also considered a type of ownership integration by some scientists (Martinez 1996). However, they must be considered as a different way of vertical coordination than ownership integration because of the different structures and activities of these producers' groups or cooperatives. Even if it is subject to dispute to some extent and needs rather a detailed investigation, some empirical evidence shows that vertical coordination between farmers and their own cooperative processing company has a

favorable outcome. It is argued that, vertical coordination through producers' cooperative can increase the financial efficiency. A grower-owned processing cooperative model appeared in the 1970s in the USA sugar industry and some of the sugar industry companies that have turned into grower-owned ones, which formerly were a kind of state enterprise in Turkey, are two successful experiences (Koenig 1995, Rehber 2004).

In a cooperative structure, because of the fact that producers, as the supplier of the raw materials, are also the owners of the processing units, one might think that the relationship between the farmers and managers of their processing units would be harmonious. Sometimes the relationship between the cooperatives or groups and their members is more of a constitutive rather than a contractual relationship. It could impose obligations in respect of production methods, product specification, and timing of delivery and so on. In practice, this type of coordination often generates problems and disputes especially when alternative marketing opportunities are available. To avoid such problems in cooperatives, a contractual relationship with member farmers is advisable (Royer 1995). There are also problems related to financing and profit-sharing. However, restructured forms of cooperatives, which are called new generation cooperatives (NGC), have been emerging especially in the USA (Fulton and Sanderson 2002, Hardesty 2004) to solve these problems. This new type of cooperative approach is also termed as one way of networks coordination in agriculture (Menard and Klein 2004).

Farmers have also been organized under bargaining cooperatives to have power when setting the terms of contractual relationships.

2.2. Theories of Vertical Coordination

2.2.1. The Life-cycle Theory

Stigler's life-cycle theory of vertical integration was based on Adam Smith's theorem: "the division of labor is limited by the extent of market" (Stigler 1951). Life-cycle theory shows that an industry is more vertically integrated in its early stage of development. When the industry is small, it does not pay for a firm to specialize in an activity that yields increasing returns to scale. As the industry grows, some existing or incoming firms may specialize in one of the processes. That is, as the industry expands, it becomes profitable for a firm to specialize. Thus, in this second stage, disintegration occurs. During the third stage, as the market shrinks, firms tend to reintegrate and undertake more processes than in the first stage. Vertical integration may emerge as a defensive strategy towards the end of the life cycle of an industry. Therefore, it was argued that vertical integration is likely to predominate in very new and very old industries and has a relatively minor role when industry is in its prime (Casson 1984).

2.2.2. Transaction Cost Theory

The history of transaction cost economics starts with Coase's famous article in 1937 explaining why a firm exists (Coase 1988). Coase argued the existence of costs of using the price mechanisms. These costs, later termed as transaction costs, include the costs of writing, executing, and enforcing contracts. Firms are established to minimize these transaction costs of exchange. If it is more expensive for a firm to acquire an input in the market place than to produce it, the firm will vertically integrate into production of the input. In short, vertical integration is a form of governance structure and can lead to lower transaction costs. After Coase's study, the literature

on the transaction cost approach to vertical coordination did not substantially develop until the late 1970s (Barry *et al.* 1992). Williamson expanded Coase's idea of transaction cost to incorporate behavioral assumptions of *opportunism*¹ and *bounded rationality*² of economic agents. This theory is based on the idea that "institutions of economic organization have a transaction cost origin" (Williamson 1973). Williamson related the characteristics of a transaction (*uncertainty, frequency and asset specificity*³) to the governance structure changing from classical contracting (spot markets) to unified governance (vertical integration) (Williamson 1979). Williamson considered the main purpose of vertical integration to be economizing of transaction costs. He identified two types of transaction costs; *ex ante* and *ex post*. *Ex ante* costs include the cost of drafting, negotiating, and safeguarding an agreement. *Ex post* costs are those costs incurred when agreements become a source of disputes. In each case these costs may include the cost of acquiring and processing information, legal costs, organization costs and costs of inefficient pricing and production behavior.

¹ Opportunism is the wayward tendencies of supplier to mislead, cheat and generally under-perform. An integrated firm minimizes these hazards by owning and directly controlling its suppliers.

² Bounded rationality is the limits of reducing transaction costs. By owning and directly controlling their own operations, an integrator firm can avoid the cost of searching for the best and the cheapest suppliers.

³ Williamson (1989, p.143) identifies four different types of transaction specific investment:

- i. **Site specificity:** Buyer and seller are in a relation with one another, reflecting *ex ante* decisions to minimize inventory and transportation expense.
- ii. **Physical asset specificity:** When one or both parties make investments in equipment and machinery that involves design characteristics and specific to the transaction and which have lower values in alternative uses.
- iii. **Human-capital specificity:** Arising as a consequence of learning-by doing, investment and transfer skills (specific human capital).
- iv. **Dedicated assets:** General investments that would not take place but for the prospects of selling a significant amount of product to a particular customer. If the contracts were terminated, it would leave the supplier with significant excess capacity.

Transaction costs can also be separated into two categories: coordination and motivation costs (Milgrom and Roberts 1992).

- i. Coordinating costs are the costs of monitoring the environment, planning and bargaining to decide what needs to be done (pre-contractual costs; *ex ante*).
- ii. Motivation costs are the cost of measuring performance, providing incentives, and enforcing agreements to ensure that people follow instructions, honor commitments, and keep agreements (post-contractual costs; *ex post*).

McFetridge (1994) suggested a neoclassical analysis of imperfect competition as a complementary approach to the transaction cost theory. Vertical integration is concerned with the opportunities for vertical exchange that arise as a consequence of imperfect competition at one or more stages of production. He argued that, theoretically, imperfect competition at one or more stages of production makes either vertical restraints or vertical integration profitable. One well known example is the successive monopoly or successive marginalization problem. McFetridge (1994) suggests that the replacement of two successive monopolies by a vertically integrated monopoly is both profitable and welfare increasing (McFetridge 1994).

2.2.3. Principal-Agent Theory

Agency theory can be separated into two branches: positivist and principal agent theory. Agency theory deals with the relationship between two parties. Positivist theory tends to be descriptive and mainly concerned with the governance mechanisms of contracts, while principal-agent theory develops quantitative models to solve for contractual optimum (Eisenhardt 1989, Grossman and Hart 1986). Agency theory assesses the optimal contractual relationship between principal and agent given the information asymmetry and degrees of risk aversions. It helps us to enhance our understanding

of how and why different contractual arrangements evolve. It has less to say about the whole picture of how different vertical coordination systems evolve such as strategic alliances and closely managed supply chains (value chains). In an agency relationship, the agent (e.g., the farmer) is expected to behave in accordance with the goals of the principals (e.g., lenders, wholesalers, processors etc.). The theory focuses on the contract between these two parties and seeks to determine the optimal contract, i.e., the contract with the most efficient organization of information and the lowest cost.

Agency theory suggests two main strategies of control: behavior based and outcome based (Eisenhardt 1985). When the behavior of the agent is observed, a behavior-based contract is optimal. In the case of complete information, the agent is aware of his/her behavior, but the principal is not. In the case of incomplete information, if the agent is rewarded based upon his/her behavior, the agent may shirk. In both cases, the principal has two options; either the principal can purchase information about the behavior of the agent and reward good behavior or the principal can reward the agent based on outcome. The optimal choice occurs between the two alternatives based on the trade-off between the cost of measuring behavior and the cost of measuring outcomes and transferring risk to the agent (Eisenhardt 1985).

In an agency relationship, because of different reasons such as information asymmetries, it is impossible to write a complete and comprehensive contract to cover all possible future events. Therefore, contracts generally are incomplete and the objectives and activities of the principal and agent will not completely coincide (Barry *et al.* 1992).

The concept of transaction cost and principal-agent theory indicates that the form of vertical linkages or coordination in an economic system depends not only on economies of size and scope

as suggested by conventional theory but also on costs incurred in completing transactions using various coordination mechanisms. Furthermore, these costs and the performance of various coordination mechanisms depend in part on the incentives and relationship between transacting parties in the system, the principal and the agent. Under various conditions, the principal and/or agent may exhibit shirking behavior or *moral hazard problem*⁴ (Boehlje and Schrader 1998).

On the other hand, positive agency theory emphasizes measurement costs but neglects asset specificity (Mahoney 1992). The integration of the transaction costs and agency approaches yields five determinants of organizational form: task programmability, task separability, demand uncertainty, technological uncertainty and asset specificity. Mahoney (1992) presented an organizational form prediction considering the interactive effects of the task programmability, task separability and transaction cost of asset specificity. The set of institutional arrangements within a transaction is called a *governance structure*. Mahoney (1992) recognizes a continuum of governance structures including spot markets, short-term contracts, franchising, joint ventures, and vertical financial ownership. Mahoney suggests that the form of coordination or business linkages will be a function of three characteristics of the transactions and the industry: *Asset specificity* refers to the specialized nature of the human or physical assets that are required to complete the transaction. The more idiosyncratic the asset is, the stronger the linkage or bound required for the transacting parties to invest in that asset. *Task programmability* indicates that a transaction is well understood by all parties and often repeated, thus not requiring intense discussions or negotiations and easily accomplished by impersonal coordination

⁴ The possibility of self-interested misbehavior before and/or after agreement (pre- and/or post-negotiation).

mechanisms. *Task separability* refers to the ability to determine and measure the value of the contribution and thus the reward that should be given to each participant in the transaction. If it can be accomplished easily (and thus transaction is separable), coordination systems will be less personal, relatively more efficient and effective than when separability did not exist.

2.2.4. Strategic Management

This concept is derived from Porter's value chain strategies to develop a strategic competitive advantage and the criteria or considerations in the integration (buy-versus-build) decision. According to Porter, the basic units of competitive advantage are discrete activities (Porter 1991). The firm is a collection of discrete but interrelated activities and its strategy defines how they are interrelated. Hence, competitive advantage will result from a firm's ability to perform the required activities at a collectively lower cost than that of rivals. The central interest of Porter's approach is that vertical coordination is a result of a firm's behavior. Boone and Verbeke (1991), in their analysis used a "strategic management of contractual relations" concept wherein the benefit is normally associated with a hierarchical organization. According to them, vertical coordination can be explained in terms of transaction costs.

Harrigan (1986) explained the dimensions of vertical integration as degree, stage, breadth, and form and tried to measure them. She took a classical strategic management perspective on vertical integration and outlined four main factors that determine the choice of vertical integration. These factors are demand and infrastructure uncertainties, market stability, bargaining power and corporate strategy requirements.

A transaction can be organized within the firm or through the market, but organizing a transaction within the firm does not eliminate contracting costs, since by doing so one replaces a contract

for intermediate input with employment contracts. Choosing the appropriate mix of contracts and improving the efficiency of each type is a source of competitive advantage (Hennart 1994). In other words, competitive advantage arises from inter-firm differences in their organizational capacities and also taking into consideration bureaucratic costs and the incentive problem of hierarchy. Hennart (1994) extended the definition of transaction costs stating that while economizing on transaction costs, vertical integration may increase the bureaucratic costs. He argued that using an appropriate coordination strategy is important within the firm and on the market.

Zajac and Olsen (1993) have indicated that the standard transaction cost theory is a one-sided analysis of cost minimization and neglects the interdependence between partners. They attempted to provide a new perspective on transaction cost analysis by offering a transactional analysis framework based on joint value maximization instead of a single-party analysis of cost minimization and by proposing a set of process dimensions relevant to create and claim value by partners. They did not claim that transaction costs do not exist or are irrelevant to the study of inter-organizational strategies. According to Zajac and Olsen, process/behavioral aspects of inter-organizational strategies must be considered.

2.2.5. Capabilities Approach

In evolutionary economics, there are several studies focusing on the “core competencies” or internal “capabilities” of firms as an explanation for the evolution of the firms and industries. Nelson (1991) presents “an emerging theory of dynamic firm capabilities”. He focuses on three different features of a firm: its strategy, its structure and its core capabilities. Chandler (1992), in his article on economic history of the industrial enterprise, focusing on the capabilities of the firms, suggests that the unit of analysis must be the firm rather than the transactions or contractual relations of the

firm. Chandler presents the value of using the firm and its learned capabilities as a unit of analysis instead of transactions or contractual relations entered by the firm, in explaining the regularities at the beginning and during the growth of modern industrial enterprise.

According to Dosi *et al.* (1994), an organization is more than minimizing the production and transaction costs. They attempt to understand corporate coherence, i.e., boundaries of the modern corporation. Enterprise learning is the ability of a firm to learn through its economic activity. This knowledge is cumulative and concerns organizational skills rather than individual skills. Individuals come and go but the organization remains (Dosi *et al.* 1994).

Knowledge-based capabilities were used first by Richardson linking capabilities with the pattern of economic organization. He suggested that in an industry there is indefinitely large number of activities. These activities have to be carried out by organizations with appropriate capabilities, i.e., with appropriate knowledge, experience and skills (Richardson 1972). He discussed that coordination among the firms could be accomplished by consolidation, cooperation and market transaction. The appropriate way of coordination depends on the degree of similarity and complementarities between or among activities.

In the capabilities view, knowledge has a central explanatory role for understanding economic organization. Contrary to neoclassical theory, the capabilities approach assumes that knowledge about production is neither explicit nor freely transferable. Under full information and no uncertainty, every organization is as efficient as any other. However, much of the knowledge is tacit and hard to formalize and communicate and can be acquired only through learning processes. Each firm processes capabilities differently than other firms and thus, will not incur

the same production costs even though they perform the same type of productive activity (Foss 1996). *Asymmetries in knowledge, i.e. differential capabilities* result in performance differences between firms. Knowledge could be transferred through the market mechanism or through firm organization. Transfer of tacit knowledge is impossible, only codified knowledge or explicit knowledge in products can be transferred across markets. Economic agents may have substantial differences in initial productive knowledge for their joint productivity. In that sense, frictions can occur between economic agents. These frictions are also called knowledge based transaction costs (Connor and Prahaland 1996).

2.2.6. Convention Theory and Contract Economics

These are the recent theoretical developments relevant to the study of vertical coordination. Prices do not constitute a determining variable to ensure coordination but are one of the links of organization subject to conventional rule. When open market works properly, quality will be assessed by a given price. However, quality conventions are necessary when the price alone cannot evaluate quality. Eymard-Duvernay distinguishes four generic forms of coordination (Sauvee 1998). *Domestic coordination* occurs when uncertainty about quality is solved through trust. In *industrial coordination*, quality is defined by a third party, outside the market, who determines the common norm and standards. If prices are sufficient indicators to evaluate quality, i.e., if there is no uncertainty about quality, then the market works by itself, which is called *market coordination*. *Civic coordination* occurs when there is a collective commitment to avoid conflicts. In this theory, a set of mechanisms and rules are considered that involve private agents as well as public institutions. The content of product specification, nature and roles of third parties involved, strategy of product differentiation or labeling or other empirical observations about quality clarify the convention.

Influenced by strategic management approaches, convention theorists insist that coordination mechanisms determine the degree of cooperation or competition between agents. Moreover, the convention theory approach shows that the definition of contracts cannot be understood exclusively at the microeconomic level, i.e., between two partners. A convention is also a mode of regulation found at a collective level, for instance a region or an industry. Unlike the neoclassic economists, convention theorists do not consider non-price exchange between firms as market failure or imperfections. Instead, adopting a positive approach, they integrate the diversity and the complexity of the quality issue and build their analysis on it. According to the Sauvee, the French School of convention theory is not yet structured into a theoretical paradigm (Sauvee 1998). An important lesson from convention theory is that the wider institutional environment can influence contract terms, e.g. whether there are independent third party standards on which to base a contract and should therefore be included in any analysis of vertical coordination. Based on the convention theory assumptions, Valceschini and Sylvander's approaches have three methodological steps for the study of vertical coordination (Valceschini 1995, Sauvee 1998):

- i. The comprehensiveness of the contract's formation cannot be understood exclusively at the microeconomic level. Indeed, the content of the contractual arrangements (micro level) may stem from institutional arrangements and institutional organizations (macro level).
- ii. These institutional arrangements greatly contribute to the shape of the competition in the sector. Contracts are not outside the competitive process but are a part of it.
- iii. The formation of these arrangements depends upon external and internal factors. Therefore, a complete vertical

coordination analysis should include the study of interplay between basic conditions and strategic behaviors and the effect of their consequences on the institutional environment.

Brousseau's *contract economics* extends the Williamsonian paradigm but reconsiders some of its fundamental assumptions. He proposes a general theory of bilateral economic relations and combines transaction cost theory and elements of industrial organization. Although strongly influenced by Williamson, Brousseau differs from him on several important matters. His definition of cost is more extensive, adding two more cost categories to the transaction costs; production and incentive costs. These three categories of costs are the basic elements for the evaluation of contract efficiency. He focuses on the comprehension of the decision process instead of defining a deterministic model of governance structure. According to him a redefined notion of contracts replaces the governance structure (Sauvee 1998).

2.2.7. Negotiating Power and Performance Incentives

Another set of arguments that may help to explain the choice and implementation of various coordination mechanisms relates to the concept of negotiation power and performance incentives. In negotiated coordination among stages in the food chain, the invisible hand of the market is replaced by the very visible hands of buyers and sellers negotiating on the terms of trade in many cases prior to the production or manufacturing process. In such a system, phenomena such as negotiating strategy, skill, power, conflict resolution, trust, performance monitoring, and evaluation become central in the system. Recent work on various approaches to provide performance incentives, as proposed by Casson, may also be useful (Boehlje and Schrader 1998). The basic presumption of Casson's work is that the overall economic performance of any system depends on transaction costs, which mainly reflect the level of trust

that exists in the economy. The level of trust in turn depends upon culture. A key concept in this argument is that of *trust*. There are two fundamental approaches for creating trust:

- i. Use of the legal system and penalize those parties that do not fulfill their negotiated commitments.
- ii. Manipulating an incentive structure in which individuals fulfill their commitments based on rewards they receive rather than penalties they incur.

Both the impossibility of writing a complete contract and asset specificity associated with modern agricultural production strengthen the role of trust in contract coordination. In a continuing game even the large contractor who is recognized as being in control must maintain a reputation for fairness. The contractor needs a group of contractees as much as the contractees need the contractor.

Another interesting approach to vertical coordination is Sporleder's interpretation of *strategic alliances* based on collaboration and the trust as the key features. Sporleder (1994), in his definition of strategic alliances, excludes merger and acquisition and other corporate partnering, and includes only informal vertical arrangements (Sporleder 1994). In this type of coordination, parties to the alliance are stakeholders in the object of cooperation but they are not shareholders. The arrangement is self-enforcing, i.e., in the event of breach of contract, the arrangement is simply terminated, and third party involvement is not anticipated. The length of this type of alliance is long-term compared to other classical one-season or one-year contracts.

2.2.8. Value Differentiation and Complementarities

Goodhue and Rauser (1999) tried to explain recent organizational changes in the food system by using the theory of complementarities.

They have defined recent changes in the agro-food system as value differentiation instead of industrialization. Value differentiation can be described as the process of increasing the value added to agricultural products by differentiating them to meet consumer requirements. The theory of complementarities in activities was first written by Milgrom and Roberts (1992).

Essentially, the theory of complementarities formalizes the notion of positive feedback effects among a firm's production, organization and management choices. A shift in an exogenous system parameter will have direct effects on the firm's activity preferences, reinforced by the feedback effects across activities. Biotechnology, information technology, and changes in consumer preferences, which are commonly viewed as the driving forces of value differentiation, are not induced by actions of the actors of agro-food chain but rather are due to changes in the lifestyles, incomes, and demographics. The value of differentiation process is driven by complementarities across activities so that a jump in one variable, such as a biotechnology-induced change in the production, will change the marginal value of other activities. This structure aids firms in identifying desired products and delivering these products to consumer at the lowest cost.

2.2.9. A Cooperative Approach

Rehber (1998) argued that the different characteristics of agricultural commodities and markets favor the use of contractual relationships in agriculture over full-integration (ownership integration). In the light of the theories and empirical evidences focusing on the relationship between farmers and integrators, he argued that, for fair and beneficial coordination for both sides and for the whole society, cooperation or collaboration is the best strategy. He explains the responsibilities of both sides, and the role of the

government. According to Rehber, the main reasons for long- and short-term contractual relationships are the structure of agricultural production systems and the features of the farm products which are not well suited to ownership integration, i.e., internalizing all transactions in a single body. The only one exception is integration under a cooperative that is owned and controlled by the raw material producers themselves.

Acting in an organized manner through a cooperative approach may avoid the undesired results of risk and uncertainties inherent and resulting from implementation of contracting such as bounded rationality, opportunism, hold-up, adverse selection, and moral hazard problems.

2.2.10. A Comparative Review

The reviewed theories focus on different aspects of vertical coordination mechanisms based on different theories and their practical implementation. They can be considered as complementary while sometimes overlapping to some extent. Although it is not easy to make strict categorization, a summary of them has been presented in Table 2.1, in order to give the whole picture and make a brief overall evaluation.

Stigler's life cycle approach has been criticized but also extended to explain the evolution of agricultural industries (Levy 1984, Barkema and Drabenstott 1995). Of course some evolution cycles can be observed in different food sub-sectors even though they are not similar in the same way with this theory.

Transaction costs and agency theory are the fundamental leading approaches, which also provide theoretical base to most of the other approaches. The transaction costs and agency theories as the two fundamental branches of the institutional economics are built on well-defined behavioral and informational assumptions.

Table 2.1: A Comparative Summary			
The Scopes and the Main Focuses of Theories			
Theories	Firm	Inter-Firms	External Issues
Theory of Life Cycle	Scope of the Firm	Evolution of the Industry	General
Transaction Cost	<ul style="list-style-type: none"> • Transaction costs • Opportunism • Bounded rationality • Uncertainty frequency • Asset specificity 		<ul style="list-style-type: none"> • General • All means of vertical coordination
Principal-Agent		<ul style="list-style-type: none"> • Incomplete contract • Information asymmetry • Moral hazard problem • Task separability • Task programmability • Uncertainty • Asset specificity 	<ul style="list-style-type: none"> • General • Contracting
Strategic Management	<ul style="list-style-type: none"> • Firm strategies • Bureaucratic costs • Strategic costs • Production cost 	Joint profit maximization	<ul style="list-style-type: none"> • General • Contracting

Contd....

<i>Contd...</i>					
	<ul style="list-style-type: none"> • Innovation and competitive strategy 				
The Capabilities Approach	<ul style="list-style-type: none"> • Strategy • Structure • Core capabilities (Knowledge-experience and skill) 				<ul style="list-style-type: none"> • General
Convention Theory				<ul style="list-style-type: none"> • Quality and third party involvement (standards and regulations) 	<ul style="list-style-type: none"> • Food Industry • Contracting
Negotiating Power and Performance Incentives		<ul style="list-style-type: none"> • Negotiating Strategy • Trust, monitoring, power, conflict solution • Strategic alliances 			<ul style="list-style-type: none"> • General • Contracting
Value Differentiation and Complementarities				<ul style="list-style-type: none"> • Innovations • Biotechnology • Information technology • Consumer preferences 	<ul style="list-style-type: none"> • Food Industry
Cooperative Approach		<ul style="list-style-type: none"> • Mutual cooperation consciousness and cooperative action 		<ul style="list-style-type: none"> • Government support 	<ul style="list-style-type: none"> • Food Industry • Contracting

Transaction costs and agency theories not only focus on the inter-firm organizations but also on the aspects of strategic behavior and intra-firm environments. The transaction cost approach provides an insight into the key role of asset specificity but neglects the interactive effect of the measurement problems that are highlighted by agency theory.

Agency theory specifically concerns with the principal's problems of coping with asymmetric information, performance measurement and incentives. Both theories see the firm as a legal entity that contracts with outsiders (suppliers, dealers, and the like) and insiders (workers and managers). Transaction cost economics helps us to understand many of the recent changes in the agro-food sectors in the western worlds (Hobbs and Young 2001). It is commonly accepted that decreasing transaction costs is one of the main reasons for rather tighter coordination. Many studies based on the transaction cost economics and their concepts highlighted why full integration is rare in the food industry while this theory advises otherwise. Despite the general acceptance, transaction cost economics is also heavily criticized. It is generally discussed that measuring the transaction costs empirically is difficult and needs further empirical research. Transaction cost theory has been criticized for neglecting the role of the social relationships, such as learning and innovations.

Agency theory contributes to understand the reasons of the existence of different types of contract relationship, and especially payment mechanism in the agricultural production contracts.

From the strategic management point of view, the incomplete character of transaction cost analysis leads to overestimation of advantages of vertical integration. Both market transactions and vertical integration are inefficient. Therefore, the main challenge of

the firm is to develop strategic management of the contractual arrangement.

Strategic management, capabilities theories mainly provide explanations of internal firm motivations and limitations on the nature and boundaries of the firms. Both of these theories assume that differential capabilities result in performance differences among firms, mainly depending on the fact that the partly tacit and distributed knowledge is embodied in capabilities. Integration into many stages would be costly because other economic agents with superior capabilities would have a relative production cost advantage. Hence, firms must rely on market transactions or cooperation between firms. Capabilities approach has been used to explain what determines the choice of organizational structure in the food system and why the food system is more tightly integrated. For example, Boon (1990) explained the capabilities approach using an example in livestock rising and argued that farrowing, nursery, and finishing are integrated within the farm while slaughtering, carcass cutting, and processing are integrated in slaughterhouses. He concluded that differential capabilities give them a production cost advantage, which may outweigh transaction cost (Boon 1999).

The basic idea behind the convention theory is that the socio-economic, political and regulatory environments as well as specific conventions, which govern inter-firm relationship, affect the vertical coordination process, considering external factors such as quality uncertainty, third party involvement and standards. In spite of methodological incompleteness, convention theory can be used in the study of quality conventions found in agricultural sub-sectors.

The other investigated theories are rather complementary and are specifically concerned with agro-food sector and try to explain the foundations of the existing means of vertical coordination. These

theories have highlighted some important issues related to vertical coordination, such as relationship between vertical formation of the firm and changes in the extent of market, collaboration and trust, complementarities, cooperation consciousness and role of the legal arrangements.

2.3. Contract Farming

2.3.1. History and the Concepts of Contract Farming

These types of vertically coordinated production relations are not new, since contracts were employed by the Japanese colonial state for sugar production in Taiwan in the period after 1885 and by the USA banana companies in central America in the early part of the twentieth century (Watts 1994). In advanced capitalist states, it seems that contract farming was widely used by the vegetable canning industry in North America and by the seed industry in the Western Europe in the 1930s and 1940s. By the late twentieth century, however across much of the Western Europe (Earliest record of forward purchase agreement is dated 1878 (Barker 1972)), North America and Japan, contract farming has become an integral part of food and fiber industry.

Contracts in a general and incomplete sense are found in agriculture everywhere in extremely heterogeneous forms. Simple market specification contracts or future purchase agreements (typically determine price, quantity and time of delivery) are common and contracts which supply labor and machinery have a wide application in agriculture (Wright 1989). Contract farming or contract production, however, must be distinguished from the multiplicity of simple marketing or labor contracts. Specifically contract farming entails relations between growers and private or state enterprises that substitute for spot market transactions between family farms and a processing, export or purchasing unit.

A standard farming contract regulates price, production practices, product quality and credit facilities, etc. in advance.

Arriving at a meaningful definition of contract farming is rather difficult. The one classic definition provided by Roy (1963) refers to a contractual arrangement between farmers and other firms, whether oral or written, specifying one or more condition of production and/or marketing of an agricultural product. Roy's definition is perhaps too broad, since it would include forward contract in which only price and volume are set. Forward contract could be sold and bought are not our interest here. In the definition above as excluding marketing arrangement such as forward contracts, two conditions must be added. First that contracts should be non-transferable and second that the terms "and/or" should be replaced by "and", that means contract must specify one or more conditions of production and marketing (Glover 1984). It is called *vertical restrictions* by some scientists. "A non-integrated firm may write long-term, binding contracts with the firms with which it deals, in which it specifies price and other terms. Such contractual restraints are called vertical restrictions" (Carlton and Perloff 1990).

However, world-wide applications in practice have caused different terms and connotations regarding contract farming to appear in related literature (Glover 1992). Hence, *contract farming* is used only for a private sector scheme, while some other terms are used for different applications as follows.

Several types of contracts are distinguished according to the number of decisions influenced, sharing of the risks and specifying contract terms. From the production decisions or management point of view, two types of contracts are determined:

- i. **Limited management contracts:** In this type, the farmer signs a contract to get some production inputs. There is not any

real guarantee for the price. The farmer's responsibility is limited only for the production inputs which he has obtained under agreement.

- ii. **Full management contracts:** In this case, the farmer and the integrator firm have a contract based on a certain amount of production. In this type of contract the farmer has to follow some provisions specified in the agreement. By this way, the producer provides a certain market for his product and insures himself against risks.

Kohls and Uhl (1985) have classified contracts into three broad categories:

- i. **Market specification contracts:** They simply specify some of the product quality measures which will be acceptable to the integrator and also some regulations are placed on the price and the method of payment. Contracts are generally signed during the plantation time. They specify how much the integrator will buy and at what price. Little or none of the farmer's management decisions are transferred. From the producer's viewpoint, they guarantee a buyer if the specifications are met.
- ii. **Resource providing contracts:** In this type, the integrators provide production resources with certain conditions, managerial help and supervision. Product prices are usually based upon the spot markets and income guarantees to the producers are minimal.
- iii. **Management and income guaranteeing contracts:** These types of contracts often include the production and marketing stipulations of the former two types. In addition, market and price risks are transferred from farmers to integrators in this type. On the other hand, the integrator takes a substantial part of the managerial responsibility of the farmers.

Another contract classification identified by Williamson (1979) is based on transaction economies. He determined uncertainty, frequency, and degree of idiosyncrasy of investment as the important characteristics of the transaction. He described three types of contracting regarding those characteristics of the transaction excluding uncertainty. These are, *classical* (market governance), *neoclassical* (trilateral governance) and *relational contracting* (bilateral and unified governance).

Contract farming has been promoted in recent three decades as an institutional innovation to improve agricultural performance in less developed countries, and also countries in transition sometimes as a key element of rural development and/or settlement projects (Ghee and Dorall 1992, Baumann 2000, USAID 2005). Local governments, private local firms, multinational companies, some international aid and lending agencies, like the US Agency for International Development, The World Bank, Asian Development Bank, Commonwealth Development Corporation have been involved in these contract farming schemes (Glover 1994, Silva 2005).

Hence, for the practical purposes contract farming applications can be classified into two broad categories as *private contract arrangements* (which have been classified and explained above) and *contract farming schemes*. Contract farming schemes are classified as follows.

- **Outgrower scheme:** Generally connotes a government scheme. In this system, the government usually has a public enterprise purchasing produce from farmers on its own or as a part of joint venture with a private firm. This term is frequently used in Africa and Asia.
- **Nucleus-Outgrower scheme:** It is a variation of the outgrower scheme in which there is a project authority which has or administers a plantation adjacent the processing plant. This

plant supplements its own plantation production by contracting in different proportions.

And the term *satellite farming* is also used referring to any of the variations of the schemes mentioned above. On the other hand, the term *multipartite arrangement* is used to emphasize the scheme in which several actors such as private firms, government and foreign aid agencies are involved.

Same implementations were analyzed into five models in one of the FAO studies as follows (Eoton and Shepherd 2001):

- i. **The centralized model:** This is almost similar to a private scheme mostly used in Africa. Schemes like these are often called “outgrower” schemes. Government involvement is limited.
- ii. **The nucleus estate model:** It is a variation of the previous model in that the central firm has also its own farm beside the contractee farmers.
- iii. **The multipartite model:** In this system, the Government or an NGO actively participates in the model along with a private firm.
- iv. **The informal model:** It includes simple and informal contracts between individual or small companies.
- v. **The intermediary model:** In this model, there are intermediaries between farmer and industry units like collectors or farmers’ committees.

2.3.2. Contract Farming – Main Reasons

The main reasons behind contract farming could be summarized as follows:

Market imperfections that may produce incentives for closer vertical coordination include imperfect competition in addition to imperfections caused by externalities and imperfect or asymmetric information. From the transaction cost framework, the neoclassic focus on market imperfections is limited because it ignores the cost of exchanges, i.e. transaction costs. The main reason for the vertical integration is to decrease these transaction costs. The degree of integration mainly depends on the frequency, asset specificity, and uncertainty regarding transactions. Asset specificity encourages internal coordination. Large investment in specialized assets increases the potential loss under unexpected market outcomes. Thus, uncertainty (price, quantity, quality and time) is an important factor favoring internal coordination along with the availability of asset specificity.

Uncertainty and reducing risk have significant coordination implications. One of the main risks is that of prices of inputs and outputs. Coordination through contracting or integration will reduce price risk to some extent. A second source of risk is related to quantity and quality features. In an open market structure, it is almost impossible to provide the required quantity of commodity in a certain quality. A third source of risk is food safety issues that can be analyzed into two dimensions; the risks for human life and for environmental pollution. Both require rather personal and coordinated market relationships.

Another main important force behind the integration and contract farming is the changes in the market structure. Well-trained buyers in the market and the necessity to supply produce with a certain quality and quantity over time are the main reasons. Consumers have become more discriminating food buyers. Increased demand of prepared food and concerns about nutrition and food safety are the important determinants for strengthening vertical

coordination (Berkama and Drabenstoll 1995). Delivering food products with improved safety characteristics requires coordination among producers, first handlers, processors, and retailers (Caswell *et al.* 1994). The primary motivation for such arrangements is to obtain greater control over the physical characteristics and quantities of commodities exchanged (Buccola and French 1981).

A strict control is required from seed to producer table for safe product through the food system which is so called traceability. This requirement can be considered as one of the important incentives behind the growth of contract farming because contracting provides one way to achieve traceability (MacDonal *et al.* 2004).

It is a fact that production technologies have been improving very rapidly. Market failure in conveying information about quality is one of the motives for increased vertical coordination (Hennessy 1996). Contract farming is seen as a sound way to push innovative technologies and provide more efficient production.

The establishment of a new processing plant requires large investment resulting in high fixed costs. An uneven supply of raw material greatly increases unit costs. Therefore, these firms have an interest in keeping raw material inflows at a steady level close to plant capacity (Roy 1963, Harryman 1994). Relying on open market purchases is unlikely to achieve this steady raw material flow.

Contract farming is also thought of as a way of commercialization and industrialization in agriculture especially for the developing and less developed countries. Contract farming will help small family farms and farm laborers who need capital and managerial assistance (Moore 1994). The majority of the farms are small. It is commonly recognized that small family farms are potentially an important source of growth in agricultural production and small-scale

agriculture has some socio-economic advantages (Rehber 1996). There are some serious constraints as well regarding the problems of access to production inputs, services, and information. Small farmers often lack the necessary production and marketing information pertaining to new crops and varieties. Even with sufficient information, they do not have the financial resources necessary. Access to credit facilities are limited mainly because of the lack of collateral. Contract farming is an example of such a mechanism that deals with many of these constraints in an integrated manner (Roy 1963, Doye *et al.* 1992). It is argued that, agro-industry can assist small farmers to shift from a subsistence traditional farming to rather industrialized one through contractual arrangement to produce mainly export-oriented high value crops (Patrick 2004). Government intervention and subsidization policy could be seen as an alternative to contract farming. Public interventions and support policies are ineffective especially in the developing countries and they do not help to remove the obstacles mentioned above. Government efforts to subsidize are mostly in favor of big farmers. The New World Order of global restructuring of the food industry symbolized by the GATT and newly established WTO, which are mainly aiming at lessening or cutting agricultural subsidies, must be considered here.

One of the main reasons to be in a closer vertical coordination for the integrators may be to avoid government restrictions (Shepperd 1990). Internal transfer of intermediate input and flexibility of adjusting production cost through internalization can be used as a way of reducing tax. Internal exchange is a means of avoiding control when the intermediate input is subject to price controls.

Apart from the reasons mentioned above, recent sophisticated ideas such as environmentally sound, sustainable and economically viable agriculture and standards and regulation related to both

environment and health safety are the main driving forces behind the fast growing use of vertical coordination and contractual arrangements in agriculture (Boehlje *et al.* 1995).

Although the reasons for change from open production and market exchange to all types of vertical relationships are essentially similar, some inherent characteristics of agricultural production and marketing dominate contractual relationships in agriculture. Despite the changes toward a market-oriented structure, the rapid decline in numbers and growth in sizes—especially in the developed western world, historically large number of individual farm units and spatial dimension of the agriculture which consists of scattered firms structure over a large area have been the major factors for the dominance of long- and short-term production contracts (Olson 1985).

Other main distinctive characteristics of agricultural products and markets could be identified as follows:

- i. Agricultural products are often bulky and/or perishable, causing shipping cost to be high, restricting mobility and limiting access to only those buyers located close to the production site.
- ii. Processors need highly specialized agricultural products and other inputs cannot normally be substituted for a given agricultural product.
- iii. Farmers are specialized to the supply of particular commodities through extensive investment in specific assets. This represents exit barriers for farmers and cause the raw product supply to be inelastic (Rogers and Sexton 1994).

2.3.3. Content of a Private Contract and Some Standards for a Fair Contract

In practice, there are important differences between private contract arrangement and contract farming schemes. However, from the contents of the contract point of view, they can be considered similar since a private contract is simply a part of contracting schemes. A fair contract should contain reciprocal obligations with a balance between the rewards and the risks accruing to each party. A production contract should at least contain the provisions presented below:

- i. Define the parties.
- ii. Specify type and the quality of the produce.
- iii. State the quantity of the produce. Contracts could be signed on acreage or tonnage basis. Processors should bear the yield risk if it is signed on acreage basis; if not, farmers should bear the yield risk.
- iv. State clearly the responsibilities of both parties concerning production and marketing practices.
- v. Indicate the manner, including timing of delivery or collection.
- vi. Determine the price (specific or formula) or other consideration and indicate the effects of variations in quality, quantity or manner of delivery and also specify the manner and timing of payment. Price is frequently left variable in contracts. Fixed or negotiated prices are frequently used in one to three year contracts. If the majority of transactions in a commodity are priced through such negotiations, the fixed price becomes the market price. Sometimes contract prices are established by a scale or formula that relates the

contract price to various economic indicators (Buccola and French 1981).

- vii. Indicate the duration of the contract and the way in which it may be terminated and/or renewed. Contracts for processing vegetables and field crops are mostly signed on annual basis. Fruit contracts tend to span more than one year (Buccola 1980).
- viii. Indicate a mediation or conciliation procedure or otherwise how disputes are to be resolved.
- ix. Provide an assignment of the contract. Contract must be signed by both parties and sometimes must be authorized by a body that both parties agreed on.

Experiences show that there must be some standards or rules for a fair contractual relationship. These are summarized below which are also included in the Competitive and Fair Agricultural Markets Act of 2006 (p.2307) introduced on Feb. 16, 2006 in the USA.

- i. The processor must present contract to the producer with honest and accurate information. Contract must be easy to read and understand. Mostly education level of farmers is not so high enough to understand complex formulas and some other quality measures. That is why simplicity of writing is important; otherwise necessary explanation has to be provided to the farmers before signing.
- ii. Contract should be in balance to determine the responsibilities of parties involved about production and marketing practices. Therefore, being in efficient coordination in making decisions these practices is very important.

- iii. A certain time length (like three days) has to be given to the producer to change his/her mind and cancel the agreement without penalty after signing the contract.
- iv. Any confidential provision must be prohibited.
- v. If contract is used as collateral by both parties, the right of each side must be underlined. Farmers need to have a right for the payment for their products from the integrators through claiming a lien. The lien secures the amount to be paid for the product by the processor to the grower or producer.
- vi. To avoid hold-up problem, contractor has to be forced to pay some amount to meet producers damages (because of the high idiosyncrasy of investment) when he/she terminates contract one sided without any breach of contract by farmer. To have rather long-term contract may also avoid hold up problem.
- vii. Unfair trade practices have to be banned.
- viii. There must be some clauses to clarify the ways of dispute solution. Some producer groups are totally against arbitration procedure as a dispute solution and require a clear prohibition of binding arbitration clauses.

3

Contract Farming in Practice

Contract farming displays great variety in practice. The form it takes, and attitudes and approaches of the producers are affected mainly by availability of other alternatives and the political, economic, and social structures at the local and national level, along with the specifications of the product (Minot 1993). When evaluating contract farming applications and their outcomes in practice, it will be more illustrative to consider contractual arrangements classification as private contract arrangements and contract farming schemes. There are some important differences in detail. While the aims and the structure of contract farming are almost similar and rather definite in the private contract farming system, the contracting schemes have hybrid structures and multiple objectives (Glover 1987).

Private contract arrangements refer to the contracts between rather commercialized big or in some cases small farmers and the integrators (processors, wholesaler, exporter etc.) while the contracting schemes are mostly concerned with multi parties:

governments, farmers, integrators, and development or donor agencies. In other words, many contractual relationships are formed mostly as organized schemes by different actors in the developing and less developed countries, while the private ones are formed mainly as those between individuals or a group of farmers and private companies in the developed world.

In particular, the nature of the crops and the technology in use for its production are the most crucial determinants of the implementation ways and characteristics of the contract farming in practice. For instance, basic grains that are not perishable and do not require strict quality control or prompt harvesting and processing do not generally require contractual arrangements (Andrews *et al.* 1994). Some products that require concentrated production and careful scheduling because of their perishability and bulkiness are generally subject to contractual relationships. For the commodities, for which supplies of both inputs and outputs are inelastic and shifting cost is very high such as broiler production, contract farming is rather common. The use of contract farming as a way of increasing agricultural productivity, improving the marketing and fostering rural developments cannot be evaluated independently from those factors mentioned above.

Then it can be indicated that the reasons behind success and shortcomings of contract farming in developed, developing and less developed countries are so different depending on the related conditions (Carney *et al.* 1994).

This chapter of the book presents a comparative evaluation of contract farming structure in the USA and Turkey, after a general review of its implementation world-wide.

3.1. A General Review

The origin of the contracting is so different. One of the main initiatives of contract farming for developed countries is the provision of steady and safe flow of the raw material to the marketing or processing industry with certain quality standards. In developed countries, sophisticated market structure, high technology level, farming structure, attitudes of the governments, etc. create a rather suitable environment for private contracting arrangements which depend on the product features. However, in the less developed world, contract farming was initiated by complementing, occasionally competing with and partially replacing plantation and estate agriculture or by organizing the independent farmers and sometimes newly settled families under state or private schemes to produce a variety of products for domestic consumption and especially for export (Watts 1994). Development of agriculture from a traditional structure to a market-oriented structure is the major challenge for developing, less developed countries and economies in transition. The main struggle is to decrease the rate of population engaged in agriculture to a certain amount through creating new employment opportunities either in non-agricultural sectors or agriculture-based industries such as food processing. For these countries, it is generally agreed that food processing is a key industry which should receive high priority both at national and international levels. The food-processing industry is important for economic growth and health of people. Development of food industry promotes development in other sectors through forward and backward linkages. Developing countries need to develop their food resources more extensively not only to provide new job opportunities and increase national income via accruing value and exports, but also to supply safe and adequate processed food to consumers.

In a globalized world, there is a close relationship between the changes in agricultural and food markets of developed countries

and developments in developing and less developed countries through international funds and donors, foreign direct investments and activities of multinational companies (Kirsten and Sartorius 2003). The wave of privatization and liberalization of developed world have helped in bringing about a new form of vertical coordination between private companies and farmers in the Central and Eastern European and other countries which are so called countries in transition (Swinnen and Maertens 2006). As an outcome, contract farming became an integral part of liberalization and agricultural transformation often bringing together multinational companies and smallholders in developing countries (Simmons *et al.* 2005).

The use of production contracts has been increasing in the developed world. For example, contracts governed 39.1% of the total value of agricultural production in the USA in 2001 up from 12 percent in 1969 as it will be discussed in the following chapter in more detail (Macdonald and Korb 2006).

In the European Union, the production aid system has been encouraging contract farming. This approach, of course has a considerable role in the development of contract farming union-wide. For instance, one of the observed changes in the Spanish food industry after joining the EU is the increase of the contractual arrangements. However, in Spain the number of the farmers involved in contract farming reached 77000 in 1988 while it was only 28000 in 1986 (Erkan *et al.* 1993). When the contribution of vertical integration and contract farming to the German agriculture was analyzed, it was concluded that these approaches can result in substantial advantages for cooperating farmers but do not automatically improve the competitive position of the parties involved (Zurek 1993). In Germany, vertical integration through contract production is already common in the dairy, poultry and

sugar sectors accounting for around 38% of agricultural production. Outside these sectors, however, only about 6% of output is produced under contract. This type of integration benefits both sides and is likely to continue (Grosskopf 1994). Contracts have played an important role in Denmark as in the other Scandinavian countries. Modern forms of contract farming in dairy have been around in Europe since the 19th century, as the traditional Danish dairy cooperatives themselves were a form of contract farming (Delgado *et al.* 2003). In another study, ten rules are proposed for a fair contract under three aspects as coordination, motivation and the transaction costs based on the Danish experience along with related theories (Bogetoft and Olesen 2002). A study based on the data of the Agricultural Census of Italy shows that contract arrangements are closely associated with farming in entire regions and reflect the state and conditions of agricultural development in each of them. This suggests that contract farming is a continually evolving process and also determines that agricultural development is linked to overall development (Pecci and Lipparini 1993).

In the other developed countries, for example, the share of broiler integration is 23% in the Korea Republic as compared to 75% in Japan in 1989 (Yi *et al.* 1993). Increased level of imported vegetables has become a considerable political issue in Japan. Contract growing has replaced use of wholesale markets for increasing share of domestic produce, and government has recently announced new support measures for domestic contract growers (Ito and Dyck 2002). In the improved feed sector, the spread of contract farming has accelerated a narrowing of the genetic base of Western agriculture, which has accompanied the development and widespread use of new crop varieties (Burch and Rickson 1990). In addition, biotechnology companies are expected to develop closer vertical coordination by responding to special markets and involvement in contract farming (Shimoda 1994).

In the developing and less-developed countries, contract farming is offered as a vehicle for the transfer of technology, modernization of peasant smallholders, and the creation of a stable and politically conservative class of family farmers. This system was accepted and used as one of the promising institutional frameworks for the delivery of price incentives, technology and other agricultural inputs. Contract farming represents an expanding and much suggested method of agro-industrial integration for developing economies. It is argued that this system of coordination holds great potential for rural development if it can be integrated easily into the national economy. Contract farming is also evaluated as a method by which agriculture in the developing world is converging with that in the developed world (Watts 1992). Contract farming has been widely used since the 1980s, especially for the products that are called “non-traditional” in some third world countries (Echanove and Steffen 2005). Recent developments in peri-urban areas of West Africa such as structural reforms, encouragement of subsistence farming to grow high-value crops, enhancing private sector have created remarkable changes in production and marketing organization (using in many cases contract farming) (Little 1999).

It has been observed that there is an increased importance in close vertical coordination in the countries in transition. At the end of 1990s, in the Czech Republic, Slovakia and Hungary, the share of the corporate farms which sold crops and animal productions on contracts ranged between 60 and 85% (Swinnen and Maertens 2006). A survey of agro-food industry in five Central Eastern Countries (Armenia, Georgia, Moldova, Ukraine and Russia) showed that the share of food companies which used contracts with producers increased from 25% in 1997 to almost 75% by 2003 (Swinnen and Maertens 2006).

Reviewed literature reflects the tremendous variety of contracting schemes in Africa and Asia regarding both the contracted

parties, the social organization of the schemes and the heterogeneity of the contract itself. Overall, contract farming has spread enough in the region that it can be considered as a significant agent of capitalist development in agriculture (Clapp *et al.* 1994). In the developing world, available infrastructure needs intensive government involvement, financial support of domestic and foreign donor agencies and initiatives of national and multinational companies.

Some studies show that the primary role of the governments should be that of a facilitator among partners to create an environment where contract farming could successfully be realized more than giving direct subsidies (ADB 2005). Some researchers stated that the growth of contract farming is related to the implementation of neo-liberal policies that are connected with the removal of state supports to agriculture based on the experiences in several third world countries. In the recent decades, there has been a tendency for transnational corporations to shift from land ownership to a contracting system.

Indeed, contract farming schemes should be examined case by case in order to understand their specific structures and their potential as a tool of rural development policies (Bauman 2000). Most contracting schemes have more than one actor beside processors and growers, especially in Africa where private sector involvement is rare. A review of 67 contract farming schemes in Africa showed that 70% of them have fully or partly government ownership (Little and Watts 1994). Some of the largest outgrowers schemes such as palm oil in the Philippines, rubber in Malaysia and tea in Kenya are public sector schemes. Some cases are more complicated in which public sector schemes are under private management or a private scheme may be supported by government subsidies, extension and research (Baumann 2000).

In the years following World War II, contract farming has been substituted for several different forms of agricultural production in Latin America. In Honduras for example, bananas once cultivated on corporate plantations, are now grown by associate producers under contract; in Peru breweries that once bought barley on the world market are now supplied by contracts with a network of farmers. One study in Mexico shows that contract farming dominates the horticultural crops for processing and export and grain for private companies. For the grain companies, the main impetus for contracting is to obtain government subsidies, either in production and/or marketing process. Mexican government promotes contract farming (*agricultura por contrato*) as an instrument that resolves problems in the grain marketing because these products were subject to free trade (Echanove and Steffen 2005).

A study based on the experience of seven countries in East and South East Africa with contract farming and outgrower schemes, in Kenya, Tanzania, Zambia, Zimbabwe, Lesotho, Swaziland and Malawi, shows that in most cases, performance in delivering services has been enhanced and resulted in increased income to the farmers despite the high management costs. A study of the experience of Zimbabwe shows that contract farming has been the motivating force behind the decision of small-scale producers to grow non-traditional vegetables under contract for export (Masakure and Henson 2005). Decreasing uncertainties, providing indirect and direct cash benefits, and interestingly providing a social prestige and being a source of self-satisfaction are found to be the main motivation, although these factors have shown variation under different conditions (Masakure and Henson 2005). In Swaziland, Fourth National Development Plan advocates the development of outgrower schemes based on the example of Vuvulane Irrigated Farms as an alternative strategy for rural development (Levin 1988).

The importance of the relationship between contract farming and farmers cooperation, besides the role of government and non-governmental organizations in the development of food industry and small farmers, were investigated in Sub-Saharan Africa (Coulter *et al.* 1999). Contract default and scale of farmer operations have been shown as two main problem areas which threaten the potential of contract farming based on the research in Zambia, Zimbabwe and Uganda.

Analysis of the Kenyan experiences has shown that contract farming has the potential to provide a Pareto-improving form of governance, and it can be used to increase the income available to the rural sector and it is a practice which may be engaged in for both efficiency and anti-competitive motives (Gross 1994). Also, a research shows that contract farming within smallholder tea production in Kenya has changed family member relations and the role and the statue of the women and men in the family (Bulow and Sorensen 1988).

In the rapidly growing economies of Southern Asia, besides the emergence of processing enterprises which meet the diversifying and growing domestic and international demand, contract farming system has been a contributing factor in the rural growth process. The responsible public sector institution, FELDA (Federal Land Development Agency) was established by the Indonesian government in 1956 and as a result Indonesian schemes are now widespread and active (Glover and Ghee 1992). A research, which was based on the case studies of village level processing and marketing activities involving soybean, cassava and tobacco in Indonesia, illustrates that significant additional income and employment can accrue to farm producers from such agricultural marketing and processing activities at the village level (Kawegae *et al.* 1994). According to the results of a study of contract farming

in some regions of Indonesia, it positively affected welfare and reduced absolute poverty (Simmons *et al.* 2005).

Results of a comparative study in Bangladesh show that although the independent farmers were able to get higher prices as compared with the contract farmers, contract farmers were better off in getting net return (Begum 2005). Another analysis in Thailand based on a survey of 445 rice farmers shows that organic rice contract farming is more profitable than conventional non-contract farming by a significant margin for all scales of production. The finding reveals that a combination of contract and organic farming is effective in improving the profitability and efficiency in rice production (Setboonsarng 2006). With reference to tobacco production in Srilanka, it is argued that contract farming can only contribute in meeting the basic needs if the income and employment it generates can be distributed with a measure of efficiency (Kirk 1987). However, Thailand's experience is quite opposite. Attempts and efforts have failed in almost every case examined (Manarungsan and Suwangindar 1992). In Thailand, the state not only proactively promotes but also mediates between farmers and contractor companies. However, a study of the Thai experience shows that, despite the state's involvement in the contract farming, it failed in decreasing the role of middlemen in the process. The research concludes that if there are enough mechanisms to monitor and use contract for development purposes, it could provide potential benefits for all the parties involved, especially small and marginal farmers (Singh 2005).

It was indicated that both farmers and firms enjoy greater flexibility if the farms are small and have diversified production activities. Of course, the failures in the related government policies have also had negative impacts on contract farming. Perhaps the most important reason for the success of the Malaysian and Indonesian experiences is the strong and continuous support provided by their Governments (Ghee and Dorall 1992).

Experiences in the same sub-regions of the world have shown variations. For example, the Malaysian schemes appear to be the most successful. They are long established and are comparatively larger in size and number. The Malaysian experience of contract farming is characterized by public sector involvement in settlement-outgrower schemes. For example, in the Sarawak state of Malaysia, contract farming is initiated as a part of an action program that trains indigenous smallholders in commercial poultry production. The result shows that this public contract scheme served more to support disadvantaged minorities than to create a pool of competitive firms (Morrison *et al.* 2006).

Contract farming in India can be traced back to the colonial period when some commodities like cotton were produced for England. Seed production has been carried out by seed companies for more than four decades in India (Singh and Asokan 2005).

India has become the second largest producer of fruit and vegetables in the world. Contract farming is generally recommended to improve the productivity (Bhatia 1994). A study, which examines relationship between firms and small producers of milk and broiler, finds that contract farming has considerably reduced transaction costs and improved market efficiency to benefit the smallholders (BIRTHAL *et al.* 2005). Another study about the poultry production in the state of Andhra Pradesh in India shows that contract production is more efficient than non-contract production (Ramaswami *et al.* 2006).

Chinese agriculture has undergone fundamental changes after the agrarian reforms initiated from beginning in 1978. Since 1990, contract farming has been supported by the Chinese governments. According to the Department of Agriculture, the planted area under all types of contract reached 18.6 million hectares in 2001, which

is approximately 40% higher than in 2000 (Guo *et al.* 2006). For example, Hu *et al.* (2004) investigated a supermarket corporation that started contracting with farmers for its own markets and exports. This firm started with 300 farms in 1999 and reached 4500 farms in 2003. Chinese experience shows that government support could significantly influence farmers' and firms' choice of contracts.

Meanwhile, there are also some general arguments against contract farming. In such a structure, agricultural policies which are shaped by public institution both at the level of national governments and international organizations are losing their importance and are being replaced by unregulated, transnational market forces (Nanda 1995). In some studies, it is argued that it changed the farming structure in less developed countries and was not for the benefit of the small growers (Runsten and Key 1996). There is possibility of exploitation as an unorganized mass of smallholders by a single buyer.

Political as well as economic factors play an important role in determining the distribution of benefits resulting from contract farming (Glover 1983). Excluding small farmers by contractor firms seems to be a common problem in some contracting schemes and needs to be solved (Gue *et al.* 2006, Simmons 2002). Some researches show that contract farming is not beneficial to the small farmers and in some cases, small farmers have been excluded altogether. Key and Runtsen (1999) based on their study of Mexican frozen vegetable industry and other studies of contract farming in Latin America noted that many processors are contracting primarily with large-scale growers leaving smallholders. Another study again focused on the suffering of the small farmers in Africa who produce on contract (Porter and Howard 1997). There are also opposite observations. For example, in Indonesia, contracting firms favored

larger farmers in the cultivation of rice and corn while favoring smaller farms in the cultivation of seed corns and broiler (Simmons *et al.* 2005). A discussion about the contract farming in the Vietnam advised a two-tiered contract system for the poor small farmers where companies make contract with cooperatives and the cooperatives subsequently make contracts with members and other farmers (Philips and Xuan 2005). It was argued that, generally, group contracts with the intermediation of local NGOs and farmers' organizations and institutions make the contracts more durable, enforceable and fair. Necessity of the legal protection to contract growers was indicated to protect them from the undesired effect of contracting (Key and Runsten 1999). On the other hand, some researches show that companies have to work with large number of small farmers in some countries where the small farms form the majority. For example, over 95% of the Romanian dairy farms have only 1-2 cows (Swinnen 2005).

3.2. An Evaluation of Contract Farming in Turkey and in the USA

3.2.1. General Structure of Food Industry and Contract Farming in Turkey

3.2.1.1. An Overview

Turkey has been a country in transition from an agricultural economy to an industrial one since the foundation of Turkish Republic in 1923. Although considerable progress has been achieved, fundamental problems still exist in agriculture and in the food sector when compared to developed countries. The shares of agriculture in national income and export value have been decreasing and were 10.27% and 11.31% respectively in 2005 (Anonymous 2006)¹. Shares of rural population and active labor

¹ Forestry, fishery, and food industry were not included.

force employed in agriculture were about 35% and 50% in 2005. One of the main obstacles of the Turkish agriculture, and of course general development efforts, is the rather high ratio of population engaged in agriculture that lives in rural areas. Turkey has 779000 sq.km total area, one-twelfth that of the USA. There are approximately 4 million farms, increasing from 3.1 million in 1960. The farm structure in Turkey is very fragmented. In 2001, 64.83% of farm households were cultivating in an area smaller than 5 ha. More than 94.19% of all farms and over 60% of the total land fell into the less than 20 ha farm size group (Anonymous 2001). There are about 37 State Farms which have an average of more than 1000ha. Most of these operate under the control of Ministry of Agriculture (General Directorate of State Farms). Although subject to privatization in the recent two decades, they played an important role in the early development stage of Turkish agriculture through introduction of high-yield seeds, new production techniques, and application of contract farming.

Development of the Turkish food industry as in the other sectors was initiated with the foundation of the Republic. The first sugar factory was established in 1926 (Hershlag 1958). Considerable progress has been achieved through five-year plans and annual programs which began in 1963. This progress accelerated in the 1970s, with market-oriented policies instead of inward-looking strategies. Turkey embarked upon rather comprehensive liberalization and structural adjustment programs especially after 1980 (Uygur 1995).

Despite several incentives devoted to the sector in the five-year development plans since 1960, food industry has not reached the desired level in Turkey. Although it is difficult to find reliable data, it could be said that the share of food supplied through processing is 10-20%, as compared to 60% in the developed world. Growth

rates ranging between 4% and 7% were achieved during the planned period. There are rather serious problems concerning the development of the food industry.

The most important, as defined by the industry, is raw material procurement problem and vertical coordination between farmers and industry.

There were 29,994 firms in the food industry according to the 2001 Industry Statistics of Turkey. Breakdown of firms by the number of the employees is presented in Table 3.1. While the number of the food firms has increased by approximately 30%, ratio of small sized firms have also increased and reached to 94.27% in the period of 1992-2001. Of the total 29,994 firms, about 50% were grain mills and bakeries. Dairy and dairy products and fruit-vegetable processing plants were the second and third having shares about 17% and 16% respectively.

The food industry's share of the total employment in the manufacturing industry was 15% while 13% of total value added of the manufacturing industry belonged to the food-processing sector. The total established capacity of the food processing plants is more than sufficient to meet domestic and export demand, but some shortage still exists because of the low capacity utilization in the entire industry. It was estimated that only 31% of the total production capacity was utilized in 1990 (Cetin *et al.* 1996).

According to the 2005 data, the share of manufacturing industry in the total domestic GNP was 20.80%. Food processing had the highest share of the manufacturing sector income (Anonymous 2006).

Total Turkish exports were 73,476 billion US dollars in 2005, 10.49% of which has come from the food industry (7,708 billion US dollars). Food industry imports were 3.3 billion US dollars which is about 3% of the total import value (Anonymous 2006).

Years	Total	Employee Number			
		1-9	%	> 10	%
1992	23,353	21,190	90,74	2,163	9.26
1993	23,341	21,375	91,58	1,966	8.42
1994	25,662	23,802	92,75	1,860	7.25
1995	24,932	23,141	92,82	1,791	7.18
1996	25,455	23,632	92,84	1,823	7.16
1997	26,206	24,347	92,91	1,859	7.09
1998	27,658	25,729	93,03	1,929	6.97
1999	28,633	26,853	93,78	1,780	6.22
2000	29,940	28,229	94,29	1,711	5.71
2001	29,994	28,276	94,27	1,718	5.73

Source: TR, State Institute of Statistics, Annual Manufacturing Industry Statistics, Various Years (Anonymous 1999, 2001a, 2002, 2002a).

Three different systems could be observed in marketing of agricultural products. Some are marketed in an organized system in which State Economic Enterprises and Cooperative organizations exist. Agricultural Sales Cooperatives (ASC) have an important role in the price supporting system. Commodity Exchanges organized and controlled by law and regulations under the control of Ministry of Commerce may be included in this system. According to recent data, there are 98 Commodity Exchanges which are located in province centers and some large districts. These are not very effective (Doser and Rehber 1987). Fresh fruit and vegetables are marketed in the wholesale market system under the control of municipalities. In this system, brokers and middlemen have an important role while the first system outlined above is working in favor of producers. The third group of agricultural products is marketed in totally free-market.

These explanations are made only to give a picture of the agricultural marketing structure of Turkey. It does not mean that each product is sold in one of these three systems. For example, if we consider milk marketing, 85% of the milk supply is handled and marketed in an unorganized manner by farmers, middlemen and approximately 2800 small manufacturing plants. Only 15% of the total supply is handled by large capacity plants which have modern technology. The number of milk plants which have 1000 ton/year processing capacity was 1308 in 1992. 91.5% of the total plants belonged to the private sector while, 3.6% and 4.9% of them running as State Enterprises and cooperatives (Anonymous 1995). Finally, it can be said that most of the agricultural products are handled in free-market conditions. From a historical perspective, the Turkish food industry has a triple structure. On the one side, State Economic Enterprises (SEEs) had been established for processing sugar beet, meat, fish, and milk. Some of these are subject to privatization and some plants have already been privatized in the past decade. SEEs in Turkey have taken a significant and a pioneering role in food industry from the beginning of the Republic. Especially the sugar industry since 1926 was not only the real pioneer in development of Turkish industry; but also the initiator of contract farming. The Turkish Dairy Industry (TDI) had an important share in processing of milk (All the plants belong to the TDI have been already privatized). Most of sugar beet production and marketing are under the control of the Turkish Sugar Factories Corporation. The Turkish Tea Company, the Meat and Fish Organization (most of them are privatized now), the Turkish Field Products Office and the State Monopolies Directories are some of the other important SEEs in the processing and marketing of related agricultural products.

The second type of organization in the Turkish food industry is cooperatives. The first agricultural sales cooperative was established

in 1911 to process figs. According to the 2006 data, there are 350 Agricultural Sales Cooperatives (ASC), 17 ASC Unions and 671,921 member farmers (Anonymous 2006a). Some of the large food processing plants still belong to these cooperative organizations. The estimated shares of the Sales Cooperatives are in dairy, 2.93%; olive oil, 6.8%; vegetable oil, 9.7%; fruit juice, 5%; and flour, 1% (Mulayim 1995). Apart from these Sales Cooperatives, Sugar Beet Producers Cooperatives, Tea Producers Cooperatives, and Village Development Cooperatives which have some food processing and handling plants must be considered. Agricultural Sales Cooperatives have serious institutional, financial and managerial problems (Mulayim 1997). They are administered and controlled by the Ministry of Commerce instead of their members. They were mainly financed by State sources and have been acting as SEEs. Therefore, the term privatization is used incorrectly for these cooperative organizations (Rehber 1995). However, from the main cooperative principles' point of view announced by the International Cooperative Alliance, agricultural cooperatives in Turkey could not be accepted as real cooperatives except Village Development Cooperatives (Rehber 1993). From the beginning of the 2000, ASC has experienced major changes under the Agricultural Reform Implementation Project. They have many challenges nowadays.

The third and most promising part of the food industry is the private sector. It is expected that the Turkish food industry will be developed in this structure in the future through relatively large private corporations which are viable in the changing and globalized market conditions of the world.

Turkish agricultural policy is outlined in five year Development Plans. The principles of agricultural policy could be summarized as follows:

- i. Price support system
- ii. Agricultural extension services
- iii. Intervention to both inputs and products markets through Public Organizations, Cooperatives and SEE
- iv. Custom and credit facilities
- v. Extension of irrigation.

The price support system was initiated in the 1930s through intervention in wheat and grape markets by purchasing in the market in order to regulate price. By the end of 1970, the number of commodities in the price support system had reached to 30. The economic liberalization program embarked upon in early 1980s has caused this figure to fall to 10 in 1990 and to 9 in 1996 (Muthoo and Onul 1996). Turkey has taken part in almost all political, economic and military movements of the West after World War II. Turkey also signed an association agreement with the EU in 1963.

Despite its eligibility underlined on several occasions, Turkey is still waiting to be a full member of the EU despite the custom union agreement signed in 1996. Turkey is the first country to enter the Custom Union with the EU without being a full member. The Custom Union covers industrial and processed agricultural products while agricultural products remain out of its scope. Turkey began the negotiation for full membership in 2005. Turkey should adjust her agricultural policy to adopt the Common Agricultural Policies.

On the other hand, in the late 1990s, Turkey has developed an Agricultural Reform Implementation Project supported and directed by International Monetary Fund and World Bank due to which fundamental changes were made in the existing agricultural policies (Togan *et al.* 2005).

3.2.1.2. Vertical Integration and Contract Farming in Turkey

When evaluating the structure of Turkish food industry from the point of view of vertical coordination, the relationships have been varied from spot market transactions, long established client relations to contractual arrangements. As observed in the investigated region, the spot market transaction was dominant in some sub-sectors while contract farming was the only way of vertical coordination in others.

National figures about the application of contract farming are not available. Sugar beet processing, and the commercialized part of broiler production operate under contractual relationships. In vegetable and fruit processing, contract farming has been used widely along with the other procurement ways. In this chapter, broiler industry and sugar beet processing have been reviewed separately while vertical coordination and the structure of contractual relationship in other sub-sectors are presented based on a field survey conducted in the Bursa region². This region had 6.2% of total plants, 8.2% of established capacity, and 7.4% of total production of Turkish food industry in 1990 (Anonymous 1993). Although these figures reveal rather unimportant amounts, fruit and vegetable processing, vegetable oil, dairy and hop industry are well developed in this region. Hop production and processing exist only in Bilecik Province (Rehber 1989). Approximately 50-60% of the fruit and vegetable processing plants which have rather large capacities are located in this region. For example, 24 of the largest tomato paste plants of the total 42 plants are in this region. Bursa Province by itself has supplied more than 55% of the Turkish tomato paste production (Akgul and Rehber 1993).

No special legislative arrangement related to contract farming existed in Turkey until 1996. In June of 1996, the Ministry of

² Bursa, Balikesir, Bilecik and Canakkale Provinces were included.

Agriculture circulated a directive (regulation) in order to control contractual arrangements. Despite the general character of this directive, it was highly detailed even describing a certain pricing formula. This directive was immediately amended two years later in August of 1998, to outline a general framework compared to the detailed structure of the previous one. It was not more than a standard contract form giving the right to the Directorates of the Ministry of Agriculture at province and district levels to control and partake in the mediation process as a third party.

3.2.1.2.1. Broiler Industry

The first attempt to establish a modern broiler industry as in the other sectors was initiated by Government through the foundation of a Central Poultry Research Center in 1930. Considerable progress was not being achieved until 1950. Around 1950, introduction of improved parent stocks contributed a real transition in the sector. Further progress was realized after 1963 by using imported hybrid varieties from abroad and a remarkable increase in exports at the beginning of 1980s has accelerated this process (Gunes *et al.* 1990).

Despite the rapid development observed during the last two decades, about 60% of the total broiler production is grown by independent growers who have no contractual coordination with processors. Therefore, a considerable amount of broilers in Turkey are grown by traditional methods and are handled in an open market system in an unorganized manner. According to 1997 data, there were 6785 broiler farms plus farms which have poultry production as a side-activity, of which 72.6% have a capacity less than 5000 head/per year.

The beginning of the vertically coordinated broiler production goes back to 1969 with the establishment of Turkish Development Foundation (TKV) to bring about rural development. At the

beginning, TKV started broiler production in a certain region by providing selective credit. Later, the small-size broiler growers were organized under regional Corporations which provide chicks, feed, services, processing and marketing. In 1985 these regional corporations were organized under a central Corporation (Holding) known as KOYTUR. In recent years, the number of regional corporations has reached 11; the number of growers who have a contract relationship with these corporations is 2220 with total 75000000 bird/year capacity, almost 20% of the total production capacity of Turkey. Beside KOYTUR, 20 corporations have controlled 90% of the industrialized broiler production through contractual arrangements with growers. Two types of vertical coordination could be observed. First, some are fully integrated. From growers to wholesalers, all activities from chick rising to processing are under control of the integrator in this system. A second system can be called partial integration. Either some of the production inputs (chicks and/or feed) or some services, i.e., processing and feed preparation, are provided from other companies outside the system.

Broiler contracts vary from integrator to integrator. Many broiler contracts are only one flock in duration. Both growers and processors have non-renewal rights. In general, the contracts have two common features. One of main features is the division of responsibility for providing inputs. The other important feature is the method used for grower compensation. The growers provide land, housing facilities, utilities (electricity and water), and labor. Operating expenses such as repair, maintenance, cleaning, and manure and dead bird disposal are also the responsibility of the farmer. The integrator provides chicks, feed, medication and advisory services. Typically, the processor company owns and operates hatcheries, feed mills and processing plant while providing transportation of feed and live birds. Other inputs such as fuel and litter are the

responsibility of the producer. Most of the integrators require strict technical qualifications regarding construction and equipment of chicken houses.

Integrators can force changes in operation whenever they wish since there is no contract to prevent such changes. Broiler growers often complain that these changes are excessively expensive (for example, new ventilation system), but they have no choice since they have already had large sunk investments.

Although the calculation methods have been varying from integrator to integrator, most broiler contracts have a similar remuneration scheme based on the performance evaluation. The performance payment is based on the feed conversion and mortality rates. A fixed price is determined and adjusted based on the grower's relative performance.

Standard mortality and feed conversion rates are determined differently from integrator to integrator. The standard feed conversion rate is calculated as an average of the grower's performances that are in the production scheme. The standard mortality rate is determined arbitrarily based on technical assumptions, generally as 5%.

Calculation of the amount paid to the growers is presented here as an example. The investigated firm has determined the standard feed conversion and mortality rates as 2.0 (f_s) and 5% (m_s). The grower has a 10000 (c) head capacity, a 1.9 (f) of feed conversion rate and a 7% of (m) mortality rate. The fixed basic price per kg live weight is 88000 (p_1) TL. 125000 (p_2) TL is the amount considered for extra feed conversion rate above or below the standard, whereas 200 (p_3) TL is the amount considered for extra 1% mortality rate above or below the standard.

The amount supplied by the growers:

$$S = c \times f (1 - m) = 10000 \times 1.9 (1 - 0.07) = 17760 \text{ kg.}$$

Since the grower has a lower feed conversion rate, $((f_s - f) = (2.0 - 1.9) = 0.1)$, he will get a bonus per kg equal to $(f_s - f) \times p_2 = 0.1 \times 125000 = 12500 \text{ TL/kg}$. The 7% mortality rate is 2% $((m_s - m) = (7 - 5) = 2)$ more than the standard rate. Therefore he should get less as a penalty equal to $(m_s - m) \times p_3 = 2 \times 200 = 400 \text{ TL/kg}$.

The price paid to this grower equals to:

$$p = p_1 \pm (f_s - f) \times p_2 \pm (m_s - m) \times p_3$$

$$p = 88000 + 12,500 - 400 = 100100 \text{ TL/g}$$

The total amount of payment:

$$T = S \times p = 17670 \times 100100 = 1768767000 \text{ TL.}$$

The method of calculation as presented above can be formulized as follows:

$$T = S \times p$$

$$T = (c \times f (1 - m)) \times (p_1 \pm (f_s - f) \times p_2 \pm (m_s - m) \times p_3)$$

3.2.1.2.2. Sugar Beet Processing

There were 25 sugar beet processing plants operating under the Sugar Factories Corporation. Four of them recently have been privatized. The Sugar Beet Producers Cooperatives own these plants as one of the partners of the ownership before. All production has been under contract farming since the beginning of the industry. This production system is also important as the first implementation of contract farming. Sugar beet has been processed in stock

companies, which are a kind of SEEs. There were 407,350 farmers producing under contractual relations with this organization in 1994.

There are also Sugar Beet Producers Cooperatives. The relationships between companies and producers were being organized by these cooperatives. The farmer in contractual relationship with a company had to be a member of the cooperative until 1994. Since 1994, this has not been required and the role of cooperatives is not as important. After the privatization in 1980s, contract provisions were being determined in favor of the farmers by the producers cooperative that had the ownership of some factories which were running as SEEs before (Anonymous 1994). It was argued that this ownership integration through producers' cooperative has increased the financial efficiency in the privatized plant as in the USA (Koenig 1995). Indeed, in Turkey, there would not be any difference in farmers' income through the type of integrator because prices are subject to the government price support system and are determined by the government, the increased efficiency in the grower-owned factories could be achieved through efficient management, better-organized delivery and payment procedures.

In the sugar beet production a simple pricing system is used based on the sugar content of the beet. Every year, the basic price which is based on 16% average sugar content has been announced by the Council of the Ministries. A premium is added or deducted according to the sugar content of the beet supplied. The premium is calculated by dividing the basic price by 16. The amount calculated for 1% sugar content is used as a premium, which is being used for the calculation of the price paid to farmers. If the supplied beet has sugar content more than 16%, the added amount equals the amount of extra percent times premium. If the sugar

content is below 16%, same system is used vice-versa. In the price system, an extra premium is also paid for early harvest to regulate supply. The sugar beet plants are classified into four groups according to the harvest period to determine the early harvest premium. That is, the early harvest premium varied from group to group. This premium is paid only if the beet has sugar content greater than or equal to 16%. Detailed information about the contract content and implementation are presented based on survey data in the following section of this chapter.

3.2.1.2.3. The Structure of Contract Farming in the Studied Region

In the studied region, contractual relationships have been widely observed, mainly in tomato paste, vegetable and fruit processing industries along with spot market transactions. Contractual arrangements account for 75% as an average especially in tomato and peas production. In dairy industry, there was no straightforward contractual links between producer and dairies. About 60-70% of the raw milk was sold in open market; the remaining 30-40% was handled in some kind of open-auction system. In the open market, processors either have stable or mobile procurement centers or raw milk bought through brokers and other middlemen.

In the auction system, as widely used in Balıkesir Province, producers are organized under a cooperative or mostly under Village Service Unions which are semi-governmental organizations. These village service unions are having an active role in organizing these auctions in favor of farmers. The role of these organizations is similar to the bargaining cooperatives in the USA (Marcus and Frederick 1994). However, there are some problems in practice.

It was observed that, in olive processing and vegetable oil industries, cooperative organizations, spot market transactions and long standing clients' relationship accounted for more than those

of contractual arrangements. “MARMARABIRLIK (The Marmara Union of Olive Sales Cooperatives)” in olive and “TRAKYABIRLIK (The Edirne Union Oil Seeds Sales Cooperatives)” in sunflower seed processing have significant shares and also have a regulator role in the table olive, olive oil and sunflower oil markets. In the region of study, some olive producers are also members of the “TARIS (A top management of four agricultural sales cooperatives)” which is located in the Aegean Region. Marmarabirlik, which is a sales cooperatives union, has the biggest share in olive processing and marketing in the region with its 8 local cooperatives and 37418 members. Trakyabirlik is also a very efficient nation-wide union which has 48 local cooperatives and 138806 members. This union’s share of sunflower growth for oil production was 34.4% in 1995 (Dayanikli 1995). However, these agricultural cooperatives have significant problems as mentioned before.

Hop production was included in the scope of this research because of its interesting features concerning producers and industry relationship. In the hop industry, private sector, a state enterprise and a farmer cooperative organization have been sharing the market. One private company tries to grow raw material in its own plantation along with contractual relationships with farmers as an out-grower scheme (Glover 1987). Another private company and State Monopoly operate in the market only during harvesting season as buyers with an advance-paid price system. There is also a farmers’ cooperative organization as a third alternative. In such a structure, despite the favorable offers, the private company could not succeed in increasing the number of the contractee farmers and also its market share over 60%. There is competition between farmers’ cooperatives and private companies. The role of the cooperative in marketing shows the importance of the farmers’ organization in contractual relationships and of obtaining bargaining power through those organizations (Koenig 1995, Ling and Liebrand 1995, Rehber 1996).

3.2.1.2.3.1. Contents of Contracts

Twenty five contracts have been examined from the region pertaining to this study. There was no special legislative base in Turkey until 1996 for production contracts which were prepared mainly on the basis of the contract sample of the Turkish Sugar Industry Stock Companies or of the personal preferences of the integrators.

There were some differences in the contents of the contract details often written in a language not easy to understand by farmers. They appear as provisions that the producers should obey arranged by the processors. Contracts generally comprise four main sections (Buccola 1980). In the first section, both parties are defined; in the second, the economic provisions of the contract and the responsibilities of both parties are presented. The third section includes technical conditions and the last section includes the authority and method for resolving disputes and dissatisfactions. The end of a contract has a signature and authorization clause.

The length of the contracts found in our sample was mostly one year; the only exception was the hop production contracts which span more than one year. Eighty percent of the examined contracts are based on tonnage while 20% have an acreage basis. The contracts have been signed by an individual producer or by a producers group in which all producers are responsible reciprocally to each other. Each producer group has a representative or a responsible producer who has the right to change or add provisions to the contract and also act as the representative of the processor. The share of this group approach is about 60% of the investigated contracts. Although the contract indicates both producers and processor's responsibilities, the producer is also responsible for extra debt receipts, especially when he has received inputs or payment in advance from the integrators. While the share of payment in advance in contract implementations was 76%, the share of the contracts

which have a debt receipts placed was about 60%. The price and payment systems vary from contract to contract. The rate of the contracts in which the constant price approach has been used was 36%, whereas the constant price plus a premium system was used in 44% of the investigated contracts.

3.2.1.2.3.2. Contracts from the Producers' Perspective

In the study region, interviews have been carried out with 75 contractees and 16 farmers who do not have contractual relations. Sixty five percent of the interviewed farmers have produced field tomatoes. Contract farming is also widely used in the production of broccoli and green pepper. In the production of tobacco, contractual relationship is compulsory as in all of Turkey. Sixty two percent of the farmers, who were interviewed, indicated guaranteed price and sale as the main reasons for signing a contract. Credit facilities and technical aids were indicated as secondary reasons. Producers generally interpret contracts as the only way of coordination, and are not necessarily being interested in what is written on the contracts. However, 54% of the producers who replied to questions about contract provisions said that they did not read the contract beforehand and merely signed it. Twenty percent of the producers who read the contract indicated that they could not understand most of the language used. In practice, contracts are prepared by the processors and offered to the producers to sign who would like to produce under contract. Sixty percent of the farmers have expressed some problems concerning the contractors' responsibilities such as delay in payment, delivery, inadequate technical input aids, and information. Processors would like to spread delivery over a long period. This causes a backlog at the delivery points and very often quality deteriorates resulting in a loss of the quality premium.

Interviewed farmers were not happy with the group approach to signing contracts. For example, in production, each group consisted of 30 farmers. The first farmer in the list was the group leader and the second one was the second in command, they sign the contract for group members. The most important problem with this approach is that group members do not meet and do not feel responsible to each other. It is clear that there is no benefit with this group approach beyond being a sound guarantee for the processor. Attitudes of group leaders acting as representatives of the processors would not be an acceptable behavior for the other farmers in the group.

Almost all of the producers would like to have a contract which is authorized by a third party, preferably represented by the Farmers Union or Directorate of Agriculture or by the so called 'muhtar' (the elected head of village).

Respondent farmers replied 95% positively to the question for organizing a bargaining cooperative as widely seen in the USA. Sixty five percent of them stated difficulties on establishing such an organization.

In the study region, 25 farmers, who are not involved in a contractual relationship, were interviewed. Only 16 questionnaires were evaluated. Seventy three percent indicated that they were familiar with contract farming, and 56% had contracts previously. Disputes related to price and methods of payment were primary reasons for not continuing with contracts. As observed in the hop production, the dissatisfaction along with the availability of other marketing alternatives have caused an attitude against contract farming.

However, even the contractee farmers had a tendency for using other alternatives to decrease market risk.

3.2.1.2.3.3. Contracts from the Processors' Perspective

It is a fact that the processors prepare contracts, which means that they determine the conditions of the contracts. However, most of the interviewed processors have agreed that all contract provisions could not be realized. Consequently, contract production could not function as a way of providing raw material, which has quality and quantity requirements.

The contractor firms argued that, farmers are reluctant to use modern inputs and technologies which were generally advised by the field experts of the firms. According to the processors, the most significant problem has been purchasing the commodities and payment. Except for the price which is subject to government intervention, all product prices are affected by the price in the open market regardless of the price in contracts. When the spot market prices are higher than the prices placed in contract, it was argued that farmers were selling the products in open market, which have been produced under contract. In order to avoid this, farmers are forced to sign an open debt receipt in addition to the contract. Moreover, the farmer who is acting in the same manner repeatedly has been punished by contract exclusion for at least a few years. In practice, this approach was called the 'red pencil'. Conversely, when the contract price is over the open market price, farmers try to supply more product which they have obtained from relatives or from outside of the contract's parcels.

There has been a competition between firms and provinces. Firms which do not have any contractee farmers, have been offering higher prices to the contractee farmers of other firms when a shortage occurs in the production or when demand for processed food increases.

Another significant problem for processors in the situation of disputes, relates to the fact that the contract itself has no meaning.

Going through the court created long delays in order to solve disagreements and disputes between producers and processors. That is why the need for mediation or a conciliation system is clear.

Processors who do not have any contractual relationship considered that they have used contract farming in the past, but it is no longer used because they can easily purchase raw material in domestic open or foreign markets. Thirty three percent of them indicated that they could use this system if they need.

3.2.2. General Structure of Food Processing Industry and Contract Farming in the USA

3.2.2.1. General Overview

The USA food system from farm to consumer can be characterized as a capital-intensive and vertically coordinated system through ownership, contracts and other vertical ties. The other main feature of the USA food system is a trend toward larger and fewer firms at every stage of food system from farming to retailing.

From the general economic indicators point of view, agriculture is one of the smaller industries, producing 2% of national output and directly employing about 2% of the labor force in 1995. However, agriculture indirectly accounts for much more employment and contributes to national gross domestic product (GNP) through other industries such as manufacturing, processing, wholesaling, and retail trade. If we consider all contributions, agriculture is responsible for providing 15.8% of the total employment and 14% of the nation's GNP (Cramer *et al.* 1997).

There were 2.1 million farms in the USA with an average of 18.95 hectares farm size, in 1995 down from five million farms in 1954. Numbers do not reflect the real concentration. It is argued that most of the nation's food and fibers are produced on about

600000 full-time commercial farms (Hamilton 1994). Most of the farms are still characterized as family farms. In 1992, individual proprietorships or family farms accounted for more than 85% of all farms, partnerships accounted for 10%, corporations 4%, and others (estates and trust) less than 1% (Cramer *et al.* 1997). Although a few percent of all farms are incorporated, corporations own 12% of all land and market 22% of the total value of all farm crops (Suits 1995).

Today, almost 90% of farm products reach consumers after having some handling and processing. Within food processing industries, the most dynamic branch was fresh and processed red meat industry. The meat packing and processing industry evolved quickly into a highly integrated, capital-intensive industry. By 1899, the meat industry accounted for 26% of manufacturing sector sales. Similarly, factory processing of butter and cheese may have begun as early as 1840s (Connor and Schiek 1997). By the turn of the century, about one-fourth of butter and 90% of all cheese was factory made. Canning of sea foods as well as fruits and vegetables began in the USA around 1820. Two of today's best known canned food companies were both established in 1869. Grain milling grew relatively slowly, by 1899 it ranked a distant second among the food industries with 20% of the total sales.

The USA sugar beet industry was also established in about 1869. Animal feed industry was first recorded during this period as by products of grain milling. Until the soybean industry was established in the 1920s, the animal feed industry depended on fish meal as the principal protein source.

Until the 1850s, nearly all companies were organized as partnerships or proprietorships. In the early 1890s, a massive merger movement began in the USA Food processing companies

that played prominent roles in this industrial restructuring (Connor and Schiek 1997).

The “Beef Trust” was one of the best known and most successful companies to develop control over its market through market-sharing arrangements and extensive vertical integration. One of the best documented histories of this period was about the “Sugar Trust”. It was reorganized under the name “American Sugar Refining Company” (Amstar) in 1891. The Trust was not successful at the beginning, but in 1893 Amstar and other sugar refineries adopted the basing point pricing system that has persisted to this day.

During the first quarter of the twentieth century, development of the food processing sector grew about 150%. This was slower than the growth rate of the entire manufacturing sector. During this period, the share of the food sector in manufacturing was approximately 22% and remained relatively stable until the late 1940s.

The number of the food processing plants continued to increase to a peak of about 65000 in 1920. A great decrease in the number of plants has been observed until 1987. The Census of 1992 showed that the number of the plants remained almost constant at 20000 since the previous census in 1987 (Table 3.2). The greatest decrease was observed during the periods of 1965-1970 and 1979-1989 mainly through merger, acquisition and vertical integration (Connor and Schiek 1997). Now this number has reached to about 26,079 with a considerable increase after 1992.

Concentration of the firms is a reality in the USA food industry. The total sales of the nation’s top 20 food and beverage manufacturers rose 32% between 1992 and 1997.

Size Category	1963		1987		1992		2002	
	Number	%	Number	%	Number	%	Number	%
1-19	23,411	62.4	10,895	52.9	11,469	55.1	18,011	69.0
20-49	6,862	18.3	3,731	18.1	3,569	17.2	3,103	11.9
50-99	3,365	9.0	2,337	11.4	2,147	10.4	1,801	6.9
100-249	2,768	7.4	2,236	10.9	2,139	10.3	1,735	6.7
250-999	1,024	2.7	1,260	6.1	1,317	6.3	1,237	4.7
Above 1000	96	0.3	124	0.6	157	0.7	192	0.8
Total	37,521	100.0	20,583	100.0	20,798	100.0	26,079	100.0

Sources: J M Connor and W A Schiek, *Food Processing*, John Wiley & Sons, Canada, 1997 p.85, and Bureau of the Census, 1992 and 2002 Census of Manufactures, Tables 1-4 (www.census.gov/econ/census02).

In 1997, these companies accounted for 52% of the industry-wide sales, higher than their 46.5% share in 1992. The total share of the top four firms is 20.3% in 1997 (Anonymous 1999a). In the USA, Government intervenes in the agricultural market through several market mechanisms. The USA farm price support was initiated in the early 1930s and despite several modifications in detail, general structure was not changed. There are four types of market intervention mechanisms: price support, restriction of supply, credit programs and subsidies (Suits 1995).

Since the 1930s, marketing orders have an important role in the marketing of agricultural products using classified pricing schemes, quality and quantity restrictions, and output restrictions orders. Marketing orders cover many markets: Production of tree nuts, dried fruits, hops, tart cherries. Olives and cranberries are covered by Federal Marketing orders. About 65% of the USA milk is federally regulated and 80% is regulated under federal or state laws (Carlton and Perloff 1990).

Marketing orders enable producers to organize marketing boards which are given powers to control the production and marketing commodities. It has been stated that, marketing boards are the only unregulated legal monopolies permitted in the USA (Suits 1995). The boards could limit production and regulate prices by restricting the quality and the volume of the products and by assigning quotas to individual producers. Future markets are used to facilitate many agricultural products in the USA since mid-1800s such as Minneapolis Grain Exchange and The Chicago Board of Trade. The main purpose of these exchanges is to provide a place in which the activities of buyers and sellers determine the prices of commodities. At these exchanges, traders buy and sell futures contracts as physical commodities (Cramer *et al.* 1997). Of course there is some close relationship between contract production and

the futures market. On one hand the rapid growth in contract farming has encouraged futures trading in other commodities. For example, contract farming in broilers has led to an increase in futures trading in corn, soybeans and soybeans products. On the other hand futures markets generate considerable information as price quotes permeate the whole market (Leuthould 1976).

Cooperatives have a major role in the USA food system. According to the 2003 data, there were 1551 marketing and 1156 supply cooperatives (the numbers were 5727 and 3222 in 1960 respectively) (Celestine *et al.* 2006). Farmer cooperatives are important for producers, marketing about 31% of the agricultural products and providing 29% of the major inputs such as fertilizer, feed, seed etc³. In 1997, farm cooperatives share (\$10.15 billion) was nearly 9% of the total agriculture sector net value-added (\$92.8 billion). Marketing cooperatives accounted for nearly 68% of cooperatives gross and net value added, farm supply 28% and related service cooperatives 4% (Kraenzle and Cummins 1999). Among the marketing cooperatives, bargaining cooperatives are special for USA agriculture. This type of cooperative is also important for the contract production because of their main function in determination of trade terms between producers and processor.

3.2.2.2. Vertical Coordination and Contract Farming in the USA

Almost one-third of the total value of production on USA farms is produced under contractual arrangement. While contracting has been significant and growing since 1960s, farmers have used contracts to produce or market agricultural commodities since early 1900s. Changes in the share of the percentage of production value

³ Cooperative aggregate market share in the United States measured at the farm gate is roughly 30%. The share is significant moreover, across several industry groups, including dairy 77%, cotton 36%, grain and soybeans 36%, fruit and vegetables 20%, and livestock 11% (Sexton 1990, p. 709).

under contract between 1991 and 2003 can be seen in Table 3.3. According to the 2003 Farm Costs and Return Surveys (FCRS), 39.1% of the total value of agricultural production was produced under contract arrangements (MacDonald and Korb 2006). Between 1991 and 1997, the share of commodities produced under marketing contracts increased from 16% to 22% of the total USA value of production (Perry *et al.* 1997). Contract use varies

Item	1991-93	1996-97	2003
Livestock	32.8	44.8	47.4
Cattle	na	17.0	28.9
Hogs	na	34.2	57.3
Poultry and eggs	88.7	84.1	88.2
Dairy	36.8	58.2	50.6
Other crops	7.8	23.8	45.9
Crops	24.7	22.9	30.8
Corn	11.4	13.0	14.3
Soybeans	10.1	13.5	14.0
Wheat	5.9	9.1	7.6
Sugar beets	91.1	75.1	95.5
Rice	19.7	25.8	51.8
Peanuts	47.5	34.2	53.3
Tobacco	0.3	0.3	54.8
Cotton	30.4	33.8	51.4
Fruit	na	56.8	68.1
Vegetables	na	38.5	42.7
Other crops	7.8	23.8	45.9
All commodities	28.9	32.1	39.1
Note: "na" indicates that data is not available.			
Source: J MacDonald and P Korb, <i>Agricultural Contract Update: Contracts in 2003</i> , USDA, ERS, 2006, <i>Economic Information Bulletin</i> 9. p.11.			

across commodities. According to the 2003 figures, contracts covered 47.4% of the livestock production and 30.8% of crop production (Macdonald and Korb 2006).

Much of the increase in use of vertical coordination in the USA swine industry has taken place through contract production. The percentage of pigs produced under contract increased from 18% to 57.3% in the USA agriculture from 1991 to 2003. In 1990, contract production accounted for 7% of food and feed grain production and 12% of cotton production. It can be realized that in the USA, the broiler industry is almost entirely vertically coordinated as in most of the developed countries (Vukina and Foster 1996). A variety of contractual arrangements are available through feed companies, integrators, genetic firms and packers. However, little is known about the profitability and risk characteristics of these alternatives. One of the researches in this subject suggests that risk neutral producers in the Midwest would prefer independent production and risk averse producers would prefer to choose among the various types of coordination arrangements (Johnson and Foster 1994, Rhodes and Grimes 1993).

It is argued that, farmers face rather lower price and yield risk through contracting, while losing their autonomy to some extent. However, it is pointed out that autonomy still matters to farmers. One of the Economic Research Service researches shows that, in the case of pig farmers, a moderate risk averse producer would need to be paid a price premium of 12% to give up the autonomy of independent production (Key and McDonald 2006). Analyses in the USA show that contracts change market structure. In the hog and poultry and also in the grain industry, it is argued that contracts are providing a way to lower costs, gain easy market access and meet consumer demands but change market functions. Prices received by farmers and paid by consumers are public while the

intermediate prices are not visible anymore (Perry and Banker 2000). Some actions have to be taken to improve contract farming conditions from the point of view of farmers (Etko 2006). A report which demanded legal arrangement to include some provisions in contract is interesting as it shows some problems in implementation. Some important ones are: Processor must present the contract with honest and accurate information including both oral and written communications. A three days time has to be given to producer to change his/her mind before signing contract. And inclusion of some additional provisions about banning unfair trade practices were reported (Etko 2006).

On the other hand, among the producers which are organized under bargaining cooperatives in the USA, there were very successful experiences against economically powerful integrators who tend to exercise monopolistic behavior. Agricultural bargaining cooperatives have become an integral part of the marketing system of certain agricultural commodities (Marcus and Frederick 1994). By the early 1960s, there were more than 325 cooperative bargaining associations involved in contract negotiation (Allen 1972). There are generally two types of contracts: marketing and production contracts.

Marketing contracts: They refer to verbal or written agreements between a contractor and a grower that sets a price or pricing system and an outlet for the commodity before harvest or before the commodity is ready to be marketed. This type of contract can take many forms:

- i. Forward sales of a growing crop, where the contract provides for later delivery and establishes a price or contains provisions for setting a price later.
- ii. Price setting after delivery based on a formula that considers grade and yield.

- iii. Pre-harvest pooling arrangements, where the amount received is determined by the net pool receipts for the quantity sold.

Production contracts: These contracts specify detailed production practices: input supplied by the contractor, quality and quantity of a particular commodity, and set a price or pricing mechanism.

In the USA agriculture, farmers can be contractors as in the outgrower schemes. Big farmers, often, in animal production act as contractors. The farmer as a contractor, can specialize in one of the stages of production, and pay another producer to either provide young animals or finish the production of commodity.

Marketing contracts are often used for crop production. In 2003, almost 30% of the value of all fruit and vegetables were produced under marketing contracts. The percentage of other crops produced under marketing contracts were sugar beets (95.1%), cotton (50.9%), soybeans (13.6%) and corn (29.7%) (MacDonald and Korb 2006). Production contracts are more likely to be used for livestock production. Poultry and poultry products produced under production contracts accounted for over 87.2% of the total value. On the other hand, 50.4% of the value of hogs production and 25.4% of the cattle were covered by production contracts (MacDonald and Korb 2006).

The contractor usually stipulates grading standards along with terms for compensating the grower. More commonly, in California and Washington, the amount paid to the grower is negotiated through a bargaining association that represents several producers.

Despite the availability of several legislative arrangements which are directly or indirectly affecting production contracts, there is no specific regulation directly related by contract farming at federal

level. Many states have considered legislative proposal, but only Minnesota, Wisconsin and Kansas have enacted new laws on the subject (Hamilton 1994a). In 1990, Minnesota enacted legislation to protect growers. Among other stipulations, the law requires notice before termination, the right to cure, and reimbursement for investments in the case of premature termination.

This law has become a model for other legislative proposals. In 1993, Wisconsin passed legislation that allows a grower a 72-hour grace period to cancel a contract. It also requires integrators to specify in writing all conditions that might cause deductions in payments to growers (Levin-Solomons 1999). Processors often oppose such legislation. For instance, it was reported that, legislation to protect poultry growers in Alabama in 1994 failed after a \$90000 lobbying campaign by processors who claimed that the law would undermine the broiler industry in that state (Hamilton 1994a). Enforcement of lien is an important legal issue to protect farmers. During a production failure resulting in losses to creditors or in the case of bankruptcy, the lien secures the amount to be paid for the product by the processor to the grower or producer. For instance, California enacted a producer's lien statute to protect farmers (Peterson and Peck 1997). Unlike California, Oregon has two separate producer liens. The Agricultural Producer Lien covers fruit, berries, vegetables or meat animals and The Grain Producers Lien covers grains (Watson 1997).

Vertical coordination structure and contracting in some of the important sub-sectors from the contract production and backward integration viewpoints are analyzed in detail below.

3.2.2.2.1. Broiler Industry

After World War II, the broiler industry grew into one of the most integrated of the USA agricultural industries. Today integrators

produce nearly all broilers under contract with growers. Broiler production nearly tripled between 1940 and 1945 despite poor feed quality and heavy disease losses (Martinez 1999). The high volume of military demand actively encouraged production in newly emerging commercial production areas (Goodhau and Rausser 1999). Besides this incentive, following the war, adoption of technological advance in genetics, disease control, nutrition and material handling have accelerated the development of the industry. These innovations increased the size of the production unit. During the early stage of broiler industry, growers would buy feed from a dealer, chicks from a hatchery, and other supplies from another dealer and sold them to the processors who offered the highest price. Along with the high capital requirements of new technologies, fluctuation in the live broiler prices left the broiler growers in financial difficulties.

Large feed companies recognized the potential of broiler industry and established production contract with growers. The first recorded broiler contract was signed in 1933 (Martinez 1999). A rapid increase in the higher supply caused a drop in the live broiler prices toward end of the 1950s. Many hatcheries and feed companies experienced considerable losses because of the overproduction and depressed broiler prices. In order to coordinate production capacity at each stage, feed companies became more directly involved in the broiler business. They developed a closer relationship with processors by acquiring or merging with processors and by building growing facilities.

As feed companies increased their processing operation, independent processors and producers found themselves with fewer markets for buying and selling broilers. Hence, independent processors established their own contracts with feed companies to obtain birds or with growers to produce the birds.

In the 1970s, many feed companies left the broiler industry because of depressed broiler prices and high input costs. Processors took over control of almost all stages to gain efficiency with the improved coordination.

Presently, few major processors control the vertical stages in broiler industry from breeding to market ready products, through vertical integration and production contracts. In 1950, 95% of broiler producers was independent. More recently, independent producers accounted for only 10% of total broiler production, whereas 88% was produced under a contract arrangement and 2% was produced in company-owned broiler facilities (vertical integration) (Martinez 1996).

A 1996 survey of broiler companies conducted by the Broiler Industry listed 48 companies, which account for almost the entire USA broiler production. The top 15 companies jointly control 77% of the total industry production. The largest broiler company produces about 22% of the entire broiler output. According to a survey conducted in 19 broiler companies, 17 companies were using tournaments as the way of setting prices; the remaining two companies were using fixed performance standards (Tsoulouhas and Vukina 1999). Knoeber and Thurman (1995) found much stronger evidence of risk reduction in the broiler chicken industry under relative performance contracts. Their research concluded that 89% of the broiler growers showed statistically significant variance reduction with relative performance contracts as compared with standard (absolute) performance contracts.

As the broiler industry has become more integrated, the types of the contracts have also changed. The first contracts between integrators and growers were *open account contracts*. The other types were *guaranty-price contracts*, *flat-fee contracts*, *feed conversation*

contracts. Today, *combination contracts* are often used which combine the desirable attributes of previously used contracts.

Production contracts (resource providing contracts) are legal agreements between an integrator and a farmer (producer) that bind the producer to specific production practices. Broiler contracts vary, but all of them have two common features. One of the main features is the division of responsibility for providing inputs. The other important feature is the method used for grower compensation. Growers provide land and housing facilities, utilities (electricity and water) and labor. Operating expenses such as maintenance, repair, and chicken house clean up, and manure and dead bird disposal are also the responsibility of the farmer (Vukina and Foster 1998). The integrator provides chicks, feed, medication and advisory services. Typically, the processor company owns and operates hatcheries, feed mills, processing plant and provides transportation of feed and live birds. The other inputs such as fuel and litter can be the responsibility of either the integrator or the producer or can be shared. Most of the integrators require strict technical qualifications regarding construction and equipment of chicken houses. Chicks of certain genetic characteristics and feed mix are also provided by the integrators. Broiler contracts can be only one flock or more than just one production cycle (Hamilton 1994a).

Poultry (or livestock) contracts differ from those used in other commodities because contracts do not involve the sale of commodities; instead they create other forms of legal relationship such as service contracts. That means contract growers do not own the product. They are being compensated for what they provide, land, building, fuel and labor. That is why producers could be accepted as relative piece-rate workers (Skully 1998).

Problems between grower and processor often result in litigation. The more common claims include: Early contract termination,

requirements for additional improvements, manipulation of quality, quantity or cost of inputs, under-weighing of poultry and feed, mis-evaluation of the producer's performance etc. (Hamilton 1994a).

Integrators can force changes in operation whenever they wish, since there is no contract to prevent such changes. Broiler growers often complain that these changes are excessively expensive (for example, new ventilation system), but they almost have no choice since they have large sunk investments. It was argued that in this situation growers face a "hold-up" problem (Lewin-Solomon 1999). Another source of risk for the grower is non-renewal of the contract (Aust 1997).

Most broiler contracts have a similar remuneration scheme which include minimum guaranteed payment, performance payment, and disaster payment. The performance payment is based on a fixed base price per pound of live meat produced and the variable bonus payment is based on the grower's relative performance. The bonus payment is determined as a percentage of differences between average settlement costs of all growers that belong to the integrator's particular center whose flocks were harvested in the same period and producer's individual settlement costs. Settlement costs are obtained by adding chick, feed, medication and other customary flock costs and dividing by the total pounds of live poultry produced. For below-average settlement costs (above-average performance) the grower receives a positive bonus, and for above average settlement costs, he receives a negative bonus. A grower with settlement costs substantially above the average cost (typically this threshold is set at 1.25 cents) will be excluded from the average, hence, other growers are not rewarded when one grower performs badly. Similarly, costs that are substantially below average also are excluded from the average (Vukina and Foster 1998).

The total payment to the grower can be formulized as follows:

$$R = (b + B) q$$

where,

b = Base payment per live pound,

B = bonus payment per live pound, and

q = the number of pounds of live poultry.

If the producer's revenue based on performance payment is smaller than some guaranteed amount, the minimum payment formula will be applied. In the case of a disaster such as fire, flood or storm, involving a loss of a part or entire of the flock, the grower will be compensated based on the disaster payment.

Organization of poultry growers is important. The recent most significant attempt was the formation of National Contract Poultry Grower Association.

3.2.2.2.2. Pork Industry

At the beginning of the twentieth century, most hogs were slaughtered by the five largest packers. They generally purchased most of their hogs through commissions from local markets. Since the beginning of the 1900s, the numbers of farms that raise hogs have been falling and the average inventory per farm has risen steadily. This trend has continued during all of the twentieth century. Prior to 1993, most pigs were raised on farms with fewer than 1000 animals in inventory. In 1996, 4880 USA farms with at least 2000 pigs in inventory accounted for 51% of the total USA swine inventory (Zering 1998). The pork sector has two production stages, farrowing and finishing. Two decades ago, most hog operations integrated farrowing-finishing operations. There has been a trend toward larger, more specified farrowing and finishing operations in recent years (Ward 1997).

In recent years, multi-year marketing contracts have been widely used between the large hog producer-integrators and large packers. In 1999, 59% of the hogs in the USA were obtained through multi-year contracting while only 2% were contracted in the 1970s and 1980s (Martinez 1999). These contracts typically specify that the producer deliver a certain quantity of hogs to a certain location at a specified time. In return, the producer receives a market-based price that is adjusted for quality premiums. A considerable amount of large hog producers sell their animals on the open market. A majority of the contract hog production is horizontally contracted among producers. The producers having more assets, managerial skills, and are the risk-takers provide the hogs and the feed to others who raise them (Lawrence *et al.* 1997).

Hog production and marketing contracts are generally written to last for 5-12 years and often require the provision of a notice of termination no shorter than a specified period, usually about six months. Provisions often exist to extend the initial terms for an additional time period subject to mutual agreement. In addition, it is possible to renegotiate the terms if new technologies or regulation arise (Hennessy and Lawrence 1999).

According to a 1994 survey, more than 50% of hogs acquired by packers were under long-term contracts via formal, written contracts with a definite term often ranging from four to seven years. Likewise, large producers indicated that 63% of the contracts were written rather than verbal and 59% were for a fixed period (1 to 15 years). The remaining contracts were verbal and typically continued until canceled (Lawrence *et al.* 1997). The packers involved in these arrangements required a minimum value of hogs with either minimum quality standards or specific genetics.

According to another survey conducted in 1996 with the 17 swine companies, two firms used tournaments, nine used fixed

performance standards, one used a fixed payment per pound, one used the bracketed scheme, one paid a fixed rent per square foot of the house, and three companies were growing pigs on company-owned farms (Tsoulouhas and Vukina 1999). Some research results show that, relative to independent production, contract farming reduces grower income variability. Relative performance contracts have the potential to further reduce income variability as opposed to absolute or standard performance contracts. Martin (1997) argued that relative performance contracts reduced income variability for 36-70% of the contract growers (Martin 1997).

Historically, production contracts have existed in three different categories of the pork production system, and recently two additional categories of contracts have emerged. Of these categories, the most common contract is for the finishing phase (Martin 1999). Despite different types of contracts changing from region to region, widely used payment methods for the finishing contracts were presented by Martin (1999) as follows:

- i. Payment per pound of gain + Potential bonus; Grower payment = $\$0.05 \times (\text{Pound gained}) + \text{feed conversion bonus} + \text{mortality bonus}$.
- ii. Payment per hog marketed + Potential bonus; Grower payment = $\$10.00 \times (\text{head marketed}) + \text{feed conversion bonus} + \text{mortality bonus}$.
- iii. Payment per square foot or per pig space; Grower payment = $\$4.00 \times (\text{Square feet available in barn}) + \text{any potential bonuses}$ or, Grower payment = $\$32.00 \text{ per pig space per year} + \text{any potential bonus}$.

Bonuses and performance incentives are important for both parties involved in the contract. In general, a bonus is determined for a low feed conversion ratio and a low mortality rate. For instance, if a standard feed conversion ratio in the contract is 3.2, but the

producer achieves a 2.9 feed conversion, the grower would receive a \$1.50 bonus (50 cents for each 1/10 point difference) on each animal marketed. For the mortality rate, a 2% death loss standard frequently appears in contracts (Martin 1999). Recently manure management also became an important factor in contract arrangement. Production contracts give the responsibility to growers for providing facilities, labor utilities, waste disposal, land, and water. Contractors provide feed, livestock, veterinary care and medication, managerial support, and marketing. The contractor bears all market risk and keeps any residual profit or losses (Zering 1998, Swinson and Martin 1997).

Pork producers are rather well organized. The principal organization is the National Pork Producers Council (NPPC) which is a producer organization that claims a membership of 85000 producers in 44 affiliated state associations. The NPPC is governed by a board of directors elected by delegates who are elected by producers (members) in each state association. Another nation-wide organization is National Pork Board which is an independent body of 15 members appointed by the Secretary of Agriculture. Members are producers from at least 12 states and/or importers (Schrader 1998).

In the past, the role of cooperatives has been small while their share of feed supplied to hog producers may be as high as 45% in some areas (Schrader 1998). More recently, Farmland Industries have attained about 6% share of hogs slaughtered and other cooperatives have actively increased their shares. New cooperatives have been formed to supply feeder pigs for producers. Some corn producers have formed hog production cooperatives as a means to market corn. In addition, group marketing, especially by smaller producers, is increasing (Schrader 1998).

3.2.2.2.3. Dairy Industry

Milk marketing in the USA is regulated by Federal Milk Marketing Orders. Marketing orders classify milk by ultimate use by consumers. For example, Class I is milk for fluid consumption. Milk orders specify minimum prices that buyers must pay for milk used in each class. Federal order prices are minimums only. Market conditions can often lead to prices above Federal order minimums. Milk orders also specify rules for distributing milk.

The dairy sector of the USA has been an exception among the other agricultural sectors in that producers' cooperatives have an important role in milk marketing and processing. According to 1997 data, dairy cooperatives received or bargained for 83% of all milk sold by farmers. Ninety eight percent of the total amounts of milk received by the cooperatives came directly from member-producers; the remaining 2% came from non-members or non-cooperative firms. Between 1992 and 1997, the number of dairy cooperatives decreased from 265 to 226 while the number of bargaining cooperatives increased from 135 to 138 (Table 3.4) (Ling 1999).

Cooperatives	1992		1997	
	Number	%	Number	%
Manufacturing cooperatives	86	32.5	63	27.8
Milk receiving stations	44	16.6	25	11.0
Bargaining cooperatives	135	50.9	138	61.2
Total	265	100.0	226	100.0

Source: K C Ling, Marketing Operation of Dairy Cooperatives, USDA, RBCS, RR No. 173. 1999.

Dairy cooperatives can be classified into three categories based on their function in the marketing channel (Ling and Liebrand 1998).

- i. *Bargaining cooperatives*: These cooperatives operate as bargaining associations. Government administered milk prices serve as a floor and the starting price in the bargaining process. Milk payment is usually pooled. In 1997, there were 138 pure marketing cooperatives, 44 cooperatives which have receiving stations and were also acting as bargaining cooperatives (Table 3.4).
- ii. *Bargaining-balancing cooperatives*: These cooperatives bargain for milk prices and also manufacture the surplus into commodity dairy products for supply balancing.
- iii. *Others* include undifferentiated hard product manufacturing, niche marketing, and fluid processing and diversified dairy cooperatives.

The experience of dairy cooperatives can be useful for other agricultural industries facing pressure of tighter vertical coordination.

3.2.2.2.4. Vegetable Processing

Vegetables for processing are mostly produced under contracts. The only exemption is those perennial crops such as asparagus and some potatoes which are produced for both processing and fresh market (Marion 1986). In 1993, 11700 farms reported at least one crop production contract. Nearly half of these farms had contracts that involved processed vegetables (Perry *et al.* 1996).

In general, a crop production contract indicates which inputs will be provided by the contractor, limited in most cases to seed and custom services such as harvesting and hauling. The amount

to be produced is specified with detailed requirements regarding production practices such as chemical and fertilizer applications. Sometimes, the contracts' quality provisions can be very detailed and strictly enforced. Many contracts include provisions requiring the grower to use only pesticides that are approved by contractor. The contractor generally stipulates grading standards along with terms of compensation of the grower. According to a Farm Costs and Returns Survey (FCRS), contractors provided seed to nearly 80% of the farms with a single production contract. The share of the farms getting special hauling services was 70% and the percentage of the chemical provided was reported as 60% (Perry *et al.* 1977).

For payment purposes they often use fixed price, applying premiums or discounts based on the quality of the crop. Vegetable producers are generally well organized under a bargaining cooperative (Hamilton 1994a). In most cases, the association does not assume title to the vegetables.

Vegetable contracts involve either guaranteed shipments in pounds per week or based on acres of production. Another special feature of vegetable contracting is the application of "passed acres" in which the integrator has the right not to harvest or accept all the crops raised under the contract. One of the most common reasons for this application is the crop raised is larger than the quantity the processor can handle (Hamilton 1994a).

In order to get detailed information about contractual relationships at the field and farm level between producers and the first handler of the fruit and vegetables (processors or wholesalers), the findings of a research done by Hueth are summarized (Hueth 1999). The contract between producers and integrators is generally a detailed written agreement that sets forth specific plans concerning when and how

particular crop should be grown. However, sometimes coordination might also realize with an informal mechanism through repeated interaction. Even when a contract takes a written form, there may still be a number of provisions which are only implicitly understood by both parties. It was determined that the coordination mechanisms used to arrange contracts vary considerably across commodities. Commodity attributes, local tradition, technology, and government regulation were identified as important factors which potentially affect the type of coordination and content of the contracts.

Hueth (1999) mentioned the proprietary nature of the contracts. He stated that “even if it is possible to obtain an example of a written contract (some integrators actually prohibit growers from sharing their contracts with anyone but the growers’ lawyer), the explicit terms of contracts reflected in formal documents are only part of the story”.

According to a survey of processed and fresh market commodities (15 fruits and vegetables), input control was provided through selection of seed variety, and plants, fertilizers, pesticides, labor, and financial support. Monitoring is carried out by fieldmen who provide technical information and communication in addition to controlling grower’s behavior. Monitoring efficiency was evaluated by the median of annual field visits per grower for each commodity which varied between 1 and 100 annual visits. The different bases were used for the quality measurement. In ten of the commodities, some form of in-house quality measurement was used; in eleven commodities, government sponsored services; and in five commodities, some form of third-party services was used. In almost all of the contracts, residual claimancy was used.

There is a difference in emphasis given on quality measurement between processing and fresh market integrators. All of the

interviewed processors have been using detailed measurement of quality to adjust grower payment, while fresh market integrators have been rarely adjusting the grower's payment (Hueth 1999).

3.2.2.2.5. Sugar Beet Industry

Since the beginning of the USA sugar beet industry in 1879, sugar beet has always been grown under a contract. In 1995, there were nine companies processing sugar beet and three of them are grower-owned cooperatives. American Crystal Sugar Company (ACS) was incorporated in 1899 as American Sugar Beet Company. In 1971, the company cut 20% of the contracted beet acreage in some states and closed some processing plants in different states (Balbach 1998). The differences between the farmers' interest and decisions of the company have created conflicts. Red River Valley Growers Association decided to buy American Crystal and form a cooperative. The growers who supply to the company became the owner. Despite the decline in the sugar beet production in the several western states, American Crystal Sugar's acreage increased from 165000 acres in 1972 to 400000 acres in 1992.

In the first sugar beet contracts written in the USA, payment was based on tonnage of beets delivered and sugar content. Major changes in contracts were made during World War I. The price of refined sugar rose more than 75% when price controls were removed. Sugar beet growers wanted to share this sugar price increase. Payment scales were changed to sugar content and the market price of sugar base, and ACS changed the payment system and added the average net selling price base instead of a fixed price per ton. This system is still used by the traditional owner-investment companies. In the 1970s, the cooperative processors made another change in beet contracts. They developed extractable sugar contents. This contract is based on the actual amount of recoverable sugar per ton of beets. A new system was developed to measure the amount of recoverable sugar by

measuring the sugar loss to molasses. The amount of sugar lost in the molasses by-product is measured as a percentage of total sugar content. The pounds of sugar recoverable from a ton of beets are calculated by subtracting the percentage sugar loss to molasses from the percentage sugar content. For example, beets with 17.57% sugar content and a 1.495% sugar loss to molasses yield 312.5 pounds recoverable sugar per ton of beets.

$(0.1757 - 0.01495) \times 2000$ pounds per ton = 321.5 pounds per ton.

According to Balbach (1998), this new system, only used by cooperative processors, provides efficiency through decreasing production costs for refined sugar, sugar loss to molasses and increasing the extraction rate and also sugar produced per ton of beet sliced.

Two types of contracts are used by other non-cooperative companies; the eastern contract and the western sliding-scale contract. In the eastern contract, growers and processors share revenues and costs at a fixed ratio. Growers receive 53.1% of the gross sales of sugar and by-products less 53.1% of the marketing costs. Growers are responsible for 53.1% of the sugar losses that occur in storage. All of the production costs belong to growers. Also, there are incentives based on the impurity level. In the western contract, the payment per ton of beets depends on the average net return per 100 pounds of sugar received by the processing company and the individual sugar contents of a grower's beets. The extraction rate is fixed.

3.2.3. A Comparative Analysis between Turkey and the USA

Naturally, there are big differences between Turkish and the USA agricultural production and farming structure. Turkish agriculture

can be characterized as a sector in transition from a traditional structure to an industrialized one. The agricultural structure in the USA is completely industrialized. The share of agriculture both in the population and GNP is approximately 2% in the USA; these figures are about 35% and 10.27% respectively in Turkey.

In Turkey, there are more than four million farms having an increasing tendency in number. The average farm size is 5 ha. In the USA the number of farms is only 2.1 million having a decreasing trend in number with 18.95 ha average size.

The Turkish food industry began to develop only after establishment of the Turkish Republic in 1923. Inevitably, establishment of the food industry was initiated by the State as in other sectors through establishment of State Economic Enterprises (SEEs). This came as a result of the "etatism" which was one of the main principles of Turkish Development Movement. Originally, the SEEs were supposed to operate with a high degree of autonomy and to survive for profits as a private entrepreneurship. After about 80 years, the SEEs are still running as State Enterprises which are subject to privatization recently.

The lion's share of the food is still consumed in an unprocessed form as household production in Turkey. The processed food share of the supply is estimated at about 10-20% of total food consumption. There is a dual structure in the food industry. There are plants that are large in size, more modern in technology, and sometimes integrated with international companies which are oriented mainly for export. However, a considerable share of the food handling is realized by small and medium size processing units which have rather backward technologies. According to the recent data, there are 29994 firms in the industry but only 1718 of them have rather large capacities which have more than 10 employees.

In the USA, the food sector began a structural transformation during the late 1800s from one that served demand for predominantly unprocessed foods toward a more concentrated one, handling increasing amounts of processed foods that reached 90% of total food consumption today. The growth in importance of very large, capital intensive and diversified food manufacturing firms has been the result of the need to achieve economies of scale in mass production and distribution as well as control over new food processing technologies. In 2002, there were 26079 food processing plants in the USA, of which 31% have 20 and more employees. There is high firm concentration in the sector. The total sales of the nation's top 20 food and beverage manufacturers accounted for 52% of the industry-wide sales, while the total share of the top four firms is 20.3% in 1997.

Cooperative movement in Turkey was also started as a Government initiative. Today, about one third of the farmers are members of Agricultural Sales Cooperatives (ASC) which have considerable share of the food processing and marketing industry. Some of the large processing plants belong to these cooperatives. Instead of establishing a democratic structure where the farmers have the right of control and management, processing plants of these cooperatives are considered to be privatized. Unfortunately after having been rearranged under ARIP project in 2000, they are facing bigger challenges than as SEEs. Agricultural cooperatives have a significant role in the agro-food system of the USA. Cooperatives have considerable share in providing production input, marketing of agricultural products, and food processing. Among the marketing cooperatives, bargaining cooperatives are special for USA agriculture. The cooperative movement started in the USA as a private initiative instead of direct state involvement. This movement was supported by enacting laws that encouraged group action in agriculture. For instance, the Capper-Volstead Act of 1922,

Cooperative Marketing Act of 1926 as well as Agricultural Fair Practices Act of 1967 have promoted and facilitated group action in agricultural markets.

Futures markets used to facilitate many agricultural products have a long historical background in the USA, while these are only recently realized in Turkey despite the availability of commodity exchanges for agricultural products since 1892.

There are also significant differences among the agricultural policies of Turkey and the USA. Market intervention through support purchases for a limited number of agricultural products, direct input subsidies, and providing selective credit are the main agricultural policy methods in Turkey. Besides the price support, supply restriction, credit programs and subsidies, marketing orders have an important role in the USA.

As a main distinctive feature of the industrialized agriculture in the USA, vertical coordination through contractual relationship is widely used. In general, more than one-third of the total value of agricultural production is realized under contractual agreement. Some sub-sectors such as broiler and sugar beet industries are totally integrated either through contractual relationship or vertical integration. In Turkey, contractual relationship started to be used by the state as a natural result of the government initiated industry structure. Today, only sugar beet processing is realized under totally contractual arrangement, while in other sub-sectors (broiler and vegetable processing) contractual relationships have been developing parallel to the development of the processing industry.

In the USA, there is no specific regulation at the federal level directly related to contract farming. Many States have proposed legislations, and some (Minnesota, Wisconsin and Kansas) have specific legislations in place. A special regulation on contract farming

was enacted in 1996 and later amended in 1998 in Turkey. There are differences among the content of contract farming legislation. In Turkey, a general framework is outlined in addition to giving responsibility to the Ministry of Agriculture as a third party to get involved in case of disputes. Legislative arrangements in the USA usually produced content stipulations to protect farmer's rights.

There is similarity between the weak position of the farmers in the contractual arrangements both in Turkey and the USA, even though some of the farmers are well organized under bargaining organizations in the States.

The content of contracts (such as payment mechanisms) is rather comprehensive in the USA. This has come as a result of a long history in contracting as compared to the contracts in Turkey. It is not surprising to observe similarities between the general content of contracts in the present globalized world considering the contract production activities of some multinational American companies (Pioneer, Philip-Morris, Cargill) in Turkey.

4

Contract Farming Problems and Bargaining

Contract production refers to the contractual arrangement between farmers (growers) and other firms (integrators) and sometimes with a third party involvement as schemes in different structures. Even though contractual relationship of the advanced agro-food system has many advantages, it also has inherent and implementation problems. The structure of contract farming in practice displays a great variety. Therefore, available structure and prevailing economic and market conditions must be considered when evaluating related problems.

The main problem for the farmers is the lack of bargaining power. Contracting is a negotiation to some extent between unequal, economically powerful buyers (processors, wholesalers etc.) and weaker farmers. Without any intervention, individual farmers have no ability to negotiate and bargain on the contract terms *ex ante*. Farmers are generally left with the only option of accepting or rejecting the contract. In the case of disputes, farmers have only the right, *ex post*, to sue or use mediation or an arbitration procedure if so placed in the contract.

This chapter summarizes contracting problems focusing on the bargaining problem and related solutions. Brief information about bargaining cooperatives and an alternative cooperative model for successful implementation has been included.

4.1. Contract Farming Problems

In general, along with a variety of related problems such as delays in delivery or payment, quality deterioration, etc., which are emerging from the implementation, contract farming generally has some disadvantages or problems as a production system as summarized below.

One of the economic factors favoring the increasing use of production contracts is the need to realize efficiencies through risk management. However, contract farming creates its own risk, despite reducing others. For the producer, the failure of producing according to contract standards will result in loss of the contract's premium prices, other risks include the non-renewal or termination of contracts, perhaps for non-economic reasons. For the processor, main risks are the failure to line-up supply, or losing timely receipt of desired quality and quantity of product, loss of technological advantage, and liability to the producers and to third parties (Kelley 1994). When the price for contracted commodity increases in the spot or alternative markets, farmers have a tendency to sell their products out of contracts or supply only a limited part of production under contracts.

A production contract includes a lot of provisions such as price, production practices, and other terms of trade which have uncertainties. In practice, however, contracts are incomplete. It is not possible to have a complete contract because it is not possible to foresee all contingencies in advance (*bounded rationality*). First, some contingencies, which parties may face in the future, may not

be foreseeable at the contracting date. Second, even if they can be foreseen, there may be too many contingencies to write into the contract. It is difficult to describe and write these contingencies accurately and there will be a cost for writing down such a plan and realizing it and solving disputes. These contingencies are rather important for agricultural production due to inherent uncertainties. In practice, contingencies that have not been planned inevitably arise. In this case, parties must find ways to adapt. These adaptations introduce the possibility of *opportunism* (Williamson 1973). In general terms, incomplete characteristics of the contracts lead to problems of imperfect commitment. Under information asymmetry, there will be *moral hazard* and *adverse selection problems* which limit the contracts that can be written and enforced. This characteristic of the contracts creates some conflicts and disputes *ex post*. When the disputes occur, litigation will cause delays. A binding arbitration as another solution alternative can give some unexpected results for both sides.

One of the important factors in vertical relationship is uncertainty regarding production and marketing. Besides, *asset specificity*, *task programmability* and *separability* are primary determinants of the degree and type of vertical coordination (Mahoney 1992). In the contractual relationship, the length and the comprehensiveness of contracts depend on these features. Today's specialized farmers do not have the flexibility to shift from commodity to commodity. They often have sizable specific investments in machinery and equipment. In the case of high asset specificity, sunk cost may create a *hold-up problem*¹. Along with idiosyncratic characteristic of

¹ A group of Iowa tomato growers brought suit against Heinz for damages, claiming an alleged breach of a crop production contract. The growers sought damages allegedly caused when the integrator terminated their growing arrangements after they had purchased an expensive tomato harvester. Growers argued they had purchased expensive mechanized tomato harvesters and made other investments in field preparation relying on the company's promises (Hamilton 1995).

investments, farmers are locked into production of certain commodities because of poor alternative uses of land or inability to enter into production of other crops or commodities. These conditions make farmers weaker in bargaining if the processors have the market power.

The farmer loses his independence and autonomy to some extent varying with the contract conditions. That means the farmer's management function is transferred to another person. It is arguable that, a skilled farmer gets worse under a contract than if he takes his chance in an open market.

Contracting has been criticized by some scientists referring to it as a way of proletarianization because of that it secures the farmer's land and labor while leaving him with the formal title for both (Clapp *et al.* 1994). Some of the contractual relationships also create new legal arguments. For instance, in poultry production, contracts do not involve sales of commodities. Poultry production under contract is a good example that producers are not considered even as farmers because they do not have the product, just leasing their labor, poultry house, equipment etc. to the contractors. In this relationship, producers are not owners of the commodity. They are paid for their labor and housing facilities. This creates a relationship similar to those between labor and business firms and requires farmers to act together and become organized as labor unions.

The contract is generally in written form, but the explicit terms of contracts reflected in the documents are only part of the story. That is, some of the provisions are implicitly used by the integrators. Other more common claims of the producers include contract termination, manipulation of quality, quantity or cost of inputs, and mis-evaluation of production performance. For instance, broiler growers often complain that these changes are sometimes excessively expensive but they have no choice since they already have large

sunk investments. The group approach and extra debt receipts for inputs provided by integrators create problems for the producers as observed in some developing countries such as Turkey.

Generally, contracts are prepared by the integrators and often the language is used that is not easily understandable by the producers. Sometimes, firms might intentionally avoid transparency in some clauses and especially in the price determination arrangement using complex formulas not well understood by farmers (Silva 2005). In addition, sometimes it is so long and is not so clear especially about provision related with integrator firm. For example, in a contracting scheme in Zambia, smallholders have to sign an 18 page agreement which specifies their obligations. The company has to provide some services, but there are no corresponding clauses protecting farmers in case of the companies default (Baumann 2000).

It is a fact that contracting is a negotiation between unequal, economically powerful agri-business and rather weaker farmers. However, farmers can incorporate to gain bargaining power to ensure fair contract terms (Harl 2000). If the integrator has gained a monopsony position, he could abuse his own position to violate contract provisions in his favor. That means when alternative marketing opportunities are closed out, an overly integrated firm or sector may beat down the terms of the contract. Of course this is not a desirable consequence for improving agricultural marketing. This problem can be described in short as “bargaining problem” that will be discussed in detail in the following part of this chapter.

Socio-economic effects of contract farming implementations have to be discussed as a part or a way of industrialized agriculture besides firms and farmers level problems. In other words, monitoring and assessment of impacts of contract farming on macro-economic level

by using some indicators such as poverty reduction, competitiveness of agriculture and equity are important. It is widely argued that contract farming has undesired consequences from the sustainable agriculture and development points of view. Intensive farming practices through contracting which require use of chemicals, improved seeds and GMO etc. have been threatening environment. The over exploitation of natural resources such as ground water, soil and created pollution are shown as examples of environmental degradation due to contract farming (Singh 2002). The multinationals tend to move new regions and contract with new growers after a certain period exhausting the local resources (Sharma 2004). Contracting farming schemes are mostly export-oriented and forwarded to producing high value products and vegetables. These export-oriented products probably do not serve to national needs and food security.

4.2. Bargaining Problem

In a market structure, if one of the parties affects prices, marketing, procurement, hiring practices, or induces reactions among other firms that lead to market-wide changes in these variables, that party can be described as having exercised market or bargaining power. Bargaining power is the ability to negotiate or bargain with sufficient influence to bring about a desired result (Ladd 1964). In other terms, “bargaining power”, “bargaining strength”, “bargaining skill,” suggest that the advantages go to the powerful, the strong or skillful (Schelling 1956). Price leadership in purchasing raw materials is a common example in the food industry. Market power of the buyer or seller creates efficiency losses through monopolistic behavior. But some economists have argued that “market power has positive virtues in a dynamic, technologically advanced economy” (Brandow 1969)².

² Brandow (1969) indicated that pure competition is not a feasible alternative for most industries, including foods. The costs of sufficiently small production units are too great. The art of getting good performance involves accepting necessary and useful forms of power while preventing those that threaten the effectiveness of competition.

Bargaining power, in general, consists of economic, behavioral and sometimes political characteristics. Let us consider economic characteristics of the power. If the commodity is in the hands of the seller who cannot be perfectly substituted by another seller, the buyer becomes dependent on the seller. The seller can exercise economic power by threatening to withhold the good. From the substitution possibility point of view, the individual farmer has no power. Despite the growth in the size of farms, supply of an individual farmer cannot meet the buyer's demand. In addition, the possibility to withhold agricultural raw products for a long period is almost impossible for the producers due to the bulkiness and perishability.

The individual farmer behaves almost as perfect competitors in marketing. This structure gives the buyers more freedom. For example, contracts for only one grow-out period may seem to be equally risky to broiler integrators and growers, but failure to renew the contract is more damaging to growers than to integrators (Rehber 2000).

Information plays a key role in the bargaining process (Kennan and Wilson 1993). The bargaining process would operate more smoothly if both parties have the same information; this would eliminate conflicts about accuracy and make objectives more realistic (Baab *et al.* 1969). Few individual farmers have basic market information or even if they have, this information is mostly incomplete or inaccurate. Processors seem better informed about production and market conditions (information asymmetry), which makes them rather powerful.

Antitrust oversight and related legislation may be seen as the first attempt to cope with the anti-competitive effects created by buyers (integrators). There are some views that support intervention

only by legislation (Lanzillotti 1960). The necessity of such attempts is not deniable, but it is not possible to control and regulate economic systems by legislation in every case. Even if conditions are favorable for regulations, any regulation will be interfered upon by attempts to optimize each party's contractual relationship. Another significant way is to strengthen farmer's bargaining power via establishing bargaining cooperatives as in the USA (Hueth and Marcoul 2003, Rehber 2000). Organizing under a bargaining cooperative improves producers' ability to cope with these disadvantages and related inherent and implementation problems of contracting.

4.2.1. Bargaining Cooperatives

Agricultural producers are considered to be in economically weaker position both in input and output markets. In a changing environment of agro-food industry, producers are also challenged by industry concentration, global competition, vertical integration, and a continued decrease in commodity prices. In response to these challenges some farmers are starting to organize cooperative associations to negotiate collectively with buyers (processors) over price and other sales conditions for their produce. The concept of collective bargaining by farmers with processors or buyers is consistent with "countervailing power" notion of the natural behavior of individuals to form organization to counteract the market power of large corporations (Oczkowski 2004). This countervailing power concept is one of the main motives behind establishing producers' groups such as cooperatives or associations. Most of these organizations are designed to perform marketing functions such as assembly, storage, processing etc. and sometimes bargained with buyers. In the USA, along with the specialized bargaining cooperatives in certain agricultural commodities, some organizations such as National Farmer Organization (NFO) and the American

Agricultural Marketing Associations (AAMA) have been organized. These organizations do not normally handle products but confine their activities in such services as collecting market information, assisting contract analysis and negotiations. For example, principal purpose of NFO was to develop collective bargaining for all American agriculture (Berry 1973).

Bargaining cooperatives are a variation of marketing cooperatives. Bargaining cooperatives are generally organized to negotiate with buyers, usually processors, on the behalf of their members (producers) for price and other terms of trade and production such as quality of product and timing of delivery (Warman and Kennedy 1998). Producers join to gain strength in negotiating terms for such items as price, quality, quantity, and delivery with processors and other buyers. Producers are expecting from their bargaining associations to establish common quality, common price, and rules on marketing their product.

Farmers' bargaining associations are voluntary cooperatives that are organized to give individual farmers a greater voice and more power in dealing with a relatively small number of processor buyers. The members of the cooperative use the bargaining organization as a means of representing their collective views and accomplish their collective aims concerning prices and terms of trade (Bunje 1980). The main objective of bargaining cooperatives is to increase grower's returns through providing bargaining power for its members. These associations are considered as a type of cartel that control disposition of the members' product (French 1987). In this way, producers may experience monopolistic behavior to have balanced power in the uncompetitive markets created by fewer and larger integrators.

Bargaining cooperatives generally do not take possession of products and not deal with processing and marketing of processed

products. Bargaining cooperatives are producers' organizations that generally only negotiate on terms of trade with buyers. They also differ from usual marketing cooperatives in that their facilities are limited generally to an office and perhaps a testing laboratory.

There are some exceptions in practice. Some cooperatives perform both bargaining and marketing functions. One example is dairy cooperatives in the USA that started as bargaining organizations but subsequently added processing facilities. Cooperative bargaining associations are an institutional feature of some agricultural products in the USA. These organizations provide a wide range of services to members, but the main function is the negotiation of price and other contract terms with contractors. Bargaining cooperatives are relatively new organizations that began in the early 1950 (Marcus 1994). Since 1950, bargaining cooperatives have become an integral part of the food industry supply chain in marketing certain agricultural commodities and products. Bargaining cooperatives operate in many fruit and vegetable markets in the USA especially on the West Coast (Siebert 2001). Agricultural Fair Practices Act issued in 1967 provided legal basis for the formation of these cooperatives and subsequent legislations in some States have created additional support. However, lack of legal protection for grower organizing efforts has been attributed by some scientists as a reason for decrease in the number of active bargaining associations (Ginder *et al.* 2006).

Although one of the bargaining issues is the price of product, it was argued that bargaining cooperatives do not have any direct influence on price (Hueth and Marcoul 2003). The price negotiation may be a useful way of price discovery under the market uncertainty. But it is clear that bargaining cooperatives have an important role in improving market efficiency by ensuring the contract reliability. Managing supply and controlling non-member free riders are the main problems such organizations face (Iskow

and Sexton 1992). The public good aspect of bargaining creates problems for bargaining cooperatives; each member has an incentive to become a non-member (Ladd 1974). That is why bargaining cooperatives try to provide other services to the members such as supply of production inputs. In practice, on the other hand, processors and handlers employ a number of tactics to discourage farmers to become organized under bargaining cooperatives or associations. These attempts take place in the form of terminating contracts, offering less favorable terms to association members, blacklisting association members, and offering incentives to nonmembers. Establishing such organizations needs legislative support. In addition, a farmers' knowledge and beliefs about the goals and the philosophy of the association have vital importance (Rehber 2000).

Despite these problems, they are a countervailing power and as such a beneficial force in improving the degree of competition in many of the agricultural commodities markets (Cramer *et al.* 1997).

Three types of bargaining cooperatives can be identified according to their functions.

- i. The first type can also be named as *pure bargaining association*, which does not handle or take title of the product, but merely sets minimum prices and terms of sales (Zeuli 2006). It establishes minimum prices and terms of sales for their members' production that are arranged by contracts which are executed by producers themselves. This type of bargaining cooperatives operate as bargaining associations and do not get involved in processing/manufacturing of commodities. California Tomato Grower Association is considered as an example of this type.
- ii. The second type of bargaining cooperatives acts as exclusive sales agent of their members and arranges contracts for the sale of their members' production in addition to negotiation

on price and terms of trade. This type is named as *marketing type* (Bunje 1988). Some fruit producers' organizations belong to this group of cooperatives such as California Canning Peach Association (CCPA). Established in 1922, CCPA is the nation's oldest farm bargaining association. As a non-profit farm cooperative, the CCPA is owned and directed by its member-growers and dedicated to serving their needs with a variety of services. Most importantly, the CCPA provides the leadership that safeguards the profitability and success of California's processing peach industry. The California Canning Peach Association is the only organization dedicated exclusively to improving the welfare of cling peach growers and the strength of California's cling peach industry. From pricing issues to legislative concerns, the CCPA provides its members with the best means available to positively influence their futures (<http://www.calpeach.com>).

Dairy cooperatives can also be included in this type. Bargaining cooperatives operate under the philosophy that dairy producers' role in the market is to produce milk and the role of dairy cooperatives is to secure the most profitable outlets for the milk and jointly prepare milk for market at the first-handler level. Further, processing and sales of dairy products are left to other handlers. Business risk for bargaining cooperatives is low as long as there are buyers of milk. Members make minimal financial commitment in their cooperatives because little capital is needed for bargaining operations. Their strength is in numbers; but in this case, the volume of milk cooperative members collectively possess. The government administered milk prices serve as a floor and the starting price in the bargaining process. Milk payment is usually pooled. In 1992, this category included

135 bargaining cooperatives and 44 bargaining cooperatives that operated as receiving stations without other plant operations. Together, the 179 cooperatives represented 68% of dairy cooperatives (Iskow and Sexton 1992).

- iii. The third type of cooperatives deals with some activities such as storing and processing in addition to realize functions that are executed by previous types. This type of cooperative is also called *bargaining-balancing cooperatives*.

Some cooperatives in the dairy industry of the USA are examples of this category. For example, this type of dairy cooperatives bargains for milk prices and manufacture the surplus into commodity dairy products for supply balancing. The main function of these cooperatives is selling milk and performing related services to other handlers. A bargaining-balancing cooperative operates much like a bargaining cooperative, except that it has plant facilities to serve handlers' needs and/or to balance milk supply. Having the capability to dispose surplus milk substantially strengthens these cooperatives' bargaining position (Ling and Liebrand 1995). Surplus milk is usually made into storable "hard" products (butter, powder and cheese) that are supported by the federal government's price-support program. In recent years, continuing decline in the government support prices for dairy products have had the effect of making supply balancing operations unprofitable or, more commonly, a losing proposition. As a result, some bargaining-balancing cooperatives have merged with larger cooperatives or have abandoned their balancing operations and become bargaining cooperatives. Others divested their own plants but invested in or have joint ventures in milk processing facilities. Some other bargaining-balancing cooperatives attempted to cover their high cost of operations by going into the consumer market, thinking that the solution was in capturing a higher share of the marketing margin. In 1992, there were 24 bargaining-balancing dairy

cooperatives (Iskow and Sexton 1992). They accounted for 9% of dairy cooperatives and 17% of total milk was marketed cooperatively.

Bargaining cooperatives have also taken up activities other than price and terms of sale negotiations. These activities summarized below are termed sometimes as *non-pricing activities*.

- i. **Market development:** Market development both for raw commodity and processed products will be beneficial for farmers and processors. That is why most bargaining associations are involved in developing demand not only for members' produce but also the products made from these commodities. Common action together with the processors is advisable. These organizations are naturally not only interested in domestic market. Most of the products are subject to international trade both as export and import. Therefore, investigation of foreign market, national foreign trade policies and legislation are the concern of bargaining cooperatives. For instance, California Tomato Grower Association became aware of the threat of foreign competitors and realized the need to take more active role in controlling imports in the early 1980s. This led to the formation of the National Association of Growers and Processors for Fair Trade (Marcus and Frederick 1994).
- ii. **Extension and training:** These include assisting farmers in adopting new crops and practices, the education of decision and policy makers at the organization level (Ginder *et al.* 2006).
- iii. **Food safety and traceability:** Food safety is an important issue for all steps of the food chain, from seed to consumer table. Bargaining cooperatives are trying to be active to provide safe supply from their members.

- iv. **Political action (lobbying):** Bargaining cooperatives act sometimes like a trade association by sponsoring industry-wide promotional activities, participating in local and national lobbying activities (Hueth and Marcoul 2003). They attempt to influence the actions of decision-makers to follow the policies for the interest of their members.
- v. **Litigation and dispute solution:** Before conciliation came along, every matter was resolved either in court or by arbitration (Spolter 1992). In the case of disputes, farmers have only the right, *ex post*, to sue (litigation) or use mediation or an arbitration procedure if so placed in the contract (Rehber 1998). Going to litigation through court systems creates long delays. An arbitrator renders a decision and a third party imposes it by taking away the control from the parties. However, in the conciliation or mediation process the parties retain control of the process and outcome. Mediation brings parties together for collaboration. In arbitration, an arbitrator renders a decision and third party imposes it, taking all the control away from the parties.

Since bargaining cooperatives generally do not get involved in any value-added activities, they do not have any profit to cover their operating expenses. Necessary funds to carry out their activities are generated from the various sources as following (Marcus and Frederick 1994):

- i. **Retains:** Cooperative which has contract for the sales of their members' produce can get the right to retain some amount of total sale values. This is placed in the membership agreement as a provision. Total retains could be paid directly to the cooperative by the processor. Amount of retain depends on sales amount. Sometimes it is determined as a percentage of one unit value of sold product.

- ii. **Interest:** A cooperative may invest its funds to any investment instrument and gain interest. These interest payments will be the source of income to the cooperative.
- iii. **Dues:** Some bargaining cooperatives collect dues monthly or annually. Amount of dues can be determined by a percentage of sales amounts.
- iv. **Service charges:** Some bargaining cooperatives have persuaded processors to pay a service charge based on a certain sum per ton over and above what the processor pays as the purchase price for the members' produce.
- v. **Other sources:** Some cooperatives have a periodical, monthly magazine or journal. Sale and/or advertisement incomes of the publications become an income source of cooperative.

4.2.2. A Theoretical Approach to Bargaining Problem

Most agricultural markets include a large number of farms, where no farm has 1% of total sales. In a typical agricultural raw product market, farmers act as price takers (Sexton 1990). On the other hand, in the first handler markets for the agricultural products, there are relatively few buyers (firms) exerting monopsony/oligopsony power. The monopsony assumption may be questionable since there is more than one firm operating in the market. Some studies have shown the existence of one or more dominant firms exerting market price determination and reducing competition in contract negotiations (dominant firm price leadership oligopsony (Just and Chern 1980, Rogers and Sexton 1994)).

Farmers may face monopolistic power from a monopsonistic buyer. When producers (farmers) are organized under a bargaining cooperative, the relationship between producers (growers) and processor (integrator) can be considered as an example of bilateral monopoly and can be explained using the theory of bilateral

monopoly. It is argued that, “even though the supplier and the buyer may select each other *ex ante* in a pool of competitive suppliers and buyers, they end up forming an *ex post* bilateral monopoly in that they have an incentive to trade between them rather than with outside partners” (Tirol 1993). Bilateral monopoly has been subject of considerable theoretical and empirical studies since Brandow (1928). Fellner (1947), for example, presented that, in the product markets, bilateral monopoly tends to establish a determinate output which equals the competitive output. On the contrary, Morgan (1949) indicated that output, which maximizes joint profits of two groups in the society, would not usually be the same as that which maximizes the profits and surpluses of society as a whole.

In the monopsony market, in order to purchase one more unit of raw material, the monopsonist firm must pay a slightly higher price, i.e., the more raw materials the firms want to employ, the higher the price must be. That is why the monopsonist firm faces an upward sloping supply curve ($S = MC$) (Figure 4.1). This involves paying not only a higher price to the marginal input but also additional price to those already used. For a monopsonist, the marginal cost of using an additional unit of input is sometimes called the marginal outlay schedule (MO) or marginal-to-marginal cost (MMC) (Figure 4.1). Figure 4.1 illustrates the restriction of the output, which reduces quantity from the competitive level of Q_1 to the monopsonized level of Q_2 .

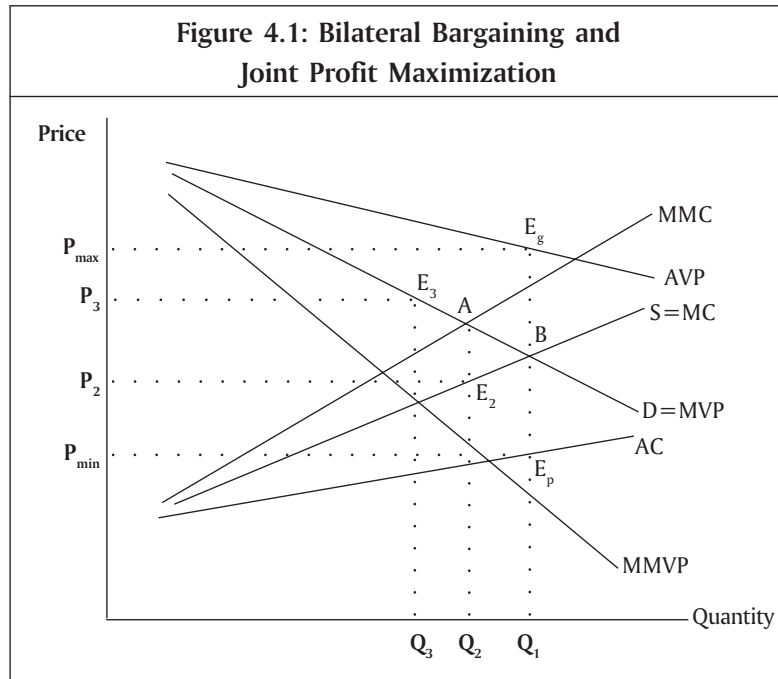
It should be noted that the product price, P_2 associated with the monopsonized output is below the price that would prevail in competition. Any gap between the demand (which represents the benefits to the society) and the supply curve (which represents the marginal cost to society) represents inefficiency. The inefficiency creates a deadweight welfare loss that equals the area of the triangle ABE_2 (Figure 4.1).

If the supplier of an input is able to form a monopoly against a monopsonist buyer, it creates a bilateral monopoly structure. The monopoly supplier faces a downward sloping demand curve (MVP) because if he wants to sell an extra unit he must lower the price (Figure 4.1). Since the lower price received from the marginal unit would be the price for the previous units sold, the marginal revenue from the extra unit (MMVP) is lower than the price received from the marginal input (MVP). A monopolistic input supplier could maximize his profit at a point where his marginal production cost ($MC = S$) equals the MMVP associated with the demand for his product (Figure 4.1). A monopolist supplier of an input would prefer equilibrium E_3 , whereas a monopsonist demander of the input prefers equilibrium E_2 . At the point E_3 , Q_3 would be produced at a price P_3 . At the point E_2 , Q_2 would be produced at a price P_2 . Thus, in the bilateral monopoly situation illustrated in Figure 4.1, the desires of the buyer and the seller are in conflict. Here neither point E_3 nor point E_2 is the equilibrium outcome. For the market to achieve equilibrium, both quantity and price are indeterminate and must be settled through bargaining (Spindler 1974).

In the bilateral relationship two cases can be distinguished:

- i. The dominance of the buyer of the raw material (at point E_2), and
- ii. The dominance of the seller of the raw material (producers) (at point E_3).

Cases (i) and (ii) are limiting cases of a range of possibilities. Analysis could be extended to include the possibility of imposing an all-or-non-clause on the opponent. For this purpose, the average revenue curve (AVP) of the buyer and the average cost curve of the seller (AC) are considered (Figure 4.1).



In a bilateral monopoly, each party exploits his bargaining power through a single price quantity combination offered to his opponent. The combination is chosen to leave the opponent only marginally better off than he would be in the no-trade situation. The AVP line indicates the appropriate price-quantity trade-off for the seller to impose upon the buyer. At any point along the AVP line the buyer is indifferent between the price-quantity combination offered and no trade at all. On the other hand, the AC line represents the combination of price and quantity, which leaves the seller indifferent to the no-trade situation.

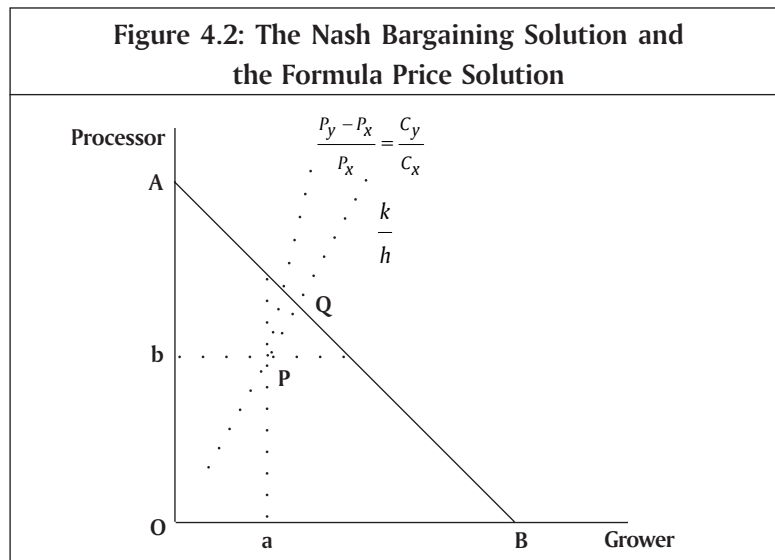
The AVP and MC lines represent the greatest concession that the opposing firms can demand; they may be termed *concession loci* (Casson 1984). Each firm seeks to maximize its profit subject to the constraint imposed by his opponent's concession locus. In this condition, the third case would be as follows.

iii. The optimal policy for both sides is to fix the quantity Q_1 corresponding to the intersection of the marginal cost curve ($MC = S$) of the seller and the marginal value product curve ($MVP = D$) of the buyer (Scherer and Ross 1990). *In case (iii), only the price is indeterminate.* The price may vary between those shown by the average cost of the seller (P_{\min}) and those shown by the average value product of the buyer (P_{\max}) for the quantity equating marginal cost (MC) with marginal value product (MVP). Here, the two parties agree upon the quantity to be traded (Q_1) (Truett and Truett 1993). The buyer will seek a full concession from the seller by stipulating a price P_{\min} . The seller at the same time will seek a full concession from the buyer by price P_{\max} . The quantity of trade upon which the parties agree is the quantity that maximizes their joint profit measured by the area of the rectangle $P_{\max} E_g E_p P_{\min}$. The contract curve is defined as the locus of bargains from which it is impossible to move towards another bargain so as to improve the position of one party without worsening that of other (Fellner 1947).

Now let us determine the profit shares of the producer (grower) and processor (integrator). The parties to the contract need only to settle on mutually agreeable shares of the joint profit or the price of the intermediate product. The problem can be solved by using the theory of cooperative games. The geometric representation of the *Nash cooperative solution* is presented in Figure 4.2. If the bilateral monopolists are respectively, producer-seller and buyer-user of an intermediate product, their objective payoff frontier is a straight line with slope of -1 reflecting the various ways in which they might divide their maximized joint profit (Bishop 1963). The maximum joint profit is measured by $OA = OB$. Point P is the no-trade point³.

³ If no agreement is reached, producer will get a , and processor will get b . Often a and b are both zero, but more generally, it is assumed that $a+b < \text{Total value to be shared}$ (Dixit and Skeath 1999).

All points on the line PQ that divide the gain in the proportion of h/k between two players lies along the straight line passing through P and having the slope k/h . However, the Nash formula says nothing about how or why such a solution might come about (Dixit and Skeath 1999). Then h and k can stand for the two parties' relative bargaining strengths. The widely advocated Nash arbitration principle implies that under the assumed conditions the profit would be allocated equally between the two stages of production.



To arrive at a solution suggests that an allocation of profit will only be agreed upon when neither party believes that it is not worth demanding further concessions from the other party. Such a belief is likely to stem from the view that the other party cannot concede further because they are already no better off than they would be in no-trade situation. In this situation, a bluffing behavior could be expected (the seller or the buyer demand more than they expect to obtain)⁴. For example, a growers' organization may convince the

⁴ The term "bluffing" is commonly used in several distinct ways. It refers to a player's deliberate misrepresentation of his expectation to influence his opponent, i.e., he demands $a + a'$ while he expects to receive a . Bluffing can also refer to misrepresenting other aspects of a bargaining situation (Cross 1965, p. 71).

processor integrator that he could generate a profit in the absence of trade. The bluff and counter bluff, of course, will not always give a unique allocation of profit. Very often, these approaches narrow the perceived amount of profit over which there is a controversy. That means allocation of profits will be achieved in two stages. First, each party exaggerates his own no-trade profit in order to increase the other party's willingness to concede. In the second stage, the Nash arbitration policy is invoked to allocate the remaining profit. The remaining profit will be shared equally between two parties.

Either party can also employ threats to alter the other party's expectation. Unlike bluffs, the object of threats is to alter the other party's expectations about his no-trade profit. When each party can threaten that outcome but nothing worse, the parties may be said to be engaged in "fixed-threat" bargaining.

The more general case of "variable-threat" bargaining implies that, in the absence of a mutually advantageous agreement, the parties have the option to adopt threats and counter threats, which may create damages⁵. For example, a producers' organization may reduce the buyer's expectation of no-trade profit by threatening if negotiations break down. While bluffs normally reduce the perception of the gains from profit, threats tend to increase them (Casson 1984). Once two parties have actually commenced regular trade with each other, they are both likely to become vulnerable to threats from the other party. This is because they may have non-recoverable sunk costs in the trading process. Typically these will be set-up costs, but in certain cases recurrent costs may be involved too. For example, the processor (as a buyer) has purchased a customized durable asset to process a precise variety of

⁵ Duopoly and other forms of oligopoly always involve variable threats as do more complex forms of bilateral monopoly, for example when disagreements are accompanied by violence or other harassments. Duopoly exemplifies variable threat bargaining, bilateral monopoly exemplifies fixed-threat bargaining (Bishop 1963, p. 559 and 582).

intermediate product supplied by the producer. Then, if the trade is aborted, it may be difficult to convert the processor's asset to an alternative use (Williamson 1971). When both firms are making specific investment in trade, each fears from the threat of the other. If a bluffing or threat behavior is effective, the no-trade point is going to be changed and a new Nash equilibrium is obtained.

An alternative solution of this problem is proposed here borrowing Blair and Kaserman's price formula approach (Blair and Kaserman 1987). They assumed that, in the absence of any contractual relationship, the profit function of the producer (grower) will be:

$$\pi_g = XP_x - XC_x \quad (1)$$

Where,

X = Quantity of intermediate input,

P_x = Unit price of X,

C_x = Average cost of X

And the processor' profit function will be

$$\pi_p = YP_y - XP_x - YC_y \quad (2)$$

Where,

Y = Quantity of final product,

P_y = Unit price of Y,

C_y = Average cost of transforming one unit of X into one unit of Y.

It was assumed that the desire of these two organizations to sign a contract would give joint profit maximization and the profit function of the coordinated production would be:

$$\pi_t = \pi_g + \pi_p \quad (3)$$

$$\pi_t = YP_y - XC_x - YC_y$$

Let us assume that the profit shares equal to α and $1-\alpha$ for the grower and processor respectively where $0 \leq \alpha \leq 1$. The parties of the contract need only to settle mutually agreeable shares of resulting maximized profit. Setting $\pi_g = \alpha \pi_t$ (i.e., $XP_x - XC_x = \alpha (YP_y - XP_x - YC_y)$), and assuming that $X = Y$ (fixed input/output ratio) and solving for P_x we obtain;

$$\begin{aligned} P_x &= \alpha (P_y - C_y) + (1 - \alpha) C_x \text{ or} \\ P_x &= C_x + \alpha (Py - C_y - C_x)^6 \end{aligned} \quad (4)$$

If they could reach an agreement they only need to specify a single parameter, α . If α is determined, the intermediate product price, P_x could be assigned as a function of α and P_y . Determination of the α and $1-\alpha$ or the ratio of $\alpha/(1-\alpha)$ is considered a cooperative game based upon the mutual gains, i.e., joint actions (Figure 4.2). That means bargaining parties (farmers' cooperative and the processor firm) find and implement a solution jointly, perhaps using a neutral third party. While the Nash solution led to the outcome $h = k = 1/2$, i.e., $\alpha/(1-\alpha) = 1$ and a fixed unique solution, the Blair and Kaserman (1987) model suggests sharing the profit (integrated monopoly markup) according to a single parameter, α , which is subject to bargaining.

I propose an alternative method to divide maximized profit between producer and integrator according to their shares in the total production cost. The share of producer α as a function of costs equals $C_x/(C_x + C_y)$, and automatically the share of the processor $(1-\alpha)$ will equal $C_y/(C_x + C_y)$.

⁶ Equations 1-4 are taken from the paper of Blair and Kaserman (1987).

Expressing $(C_x + C_y) = M$, $\alpha = C_x/M$ and substituting them into equation 4, we get;

$$\begin{aligned} P_x &= C_x + (C_x/M) (P_y - (C_y + C_x)) \text{ or since } (C_x + C_y) = M, \\ &= C_x + (C_x/M) (P_y - M), \\ &= C_x + (C_x P_y/M) - (C_x M/M) \text{ and} \\ &= C_x + (C_x P_y/M) - C_x \\ &= C_x P_y/M, \text{ since } \alpha = C_x/M \end{aligned}$$

$$P_x = \alpha P_y \quad (5)$$

According to the Nash and Blair and Kaserman solutions, the gains from trade are shared with a ratio of h/k and $\alpha/(1-\alpha)$ respectively, which are determined as a reflection of the two parties' relative bargaining strength (Figure 4.2). In my proposed alternative, the gain (profit) is shared with a ratio based on the actual cost figures, i.e. equal to $(C_x/M)/(1-(C_x/M))$ or $C_x/(M - C_x)$ since $(C_x + C_y) = M$, or C_x/C_y .

This ratio can also be expressed as a function of intermediate and final product prices from equation (5) as $P_x/(P_y - P_x)$ ⁷ (Figure 4.2). This approach provides a practical solution for the bargaining process. As in the Blair and Kaserman model, the only disadvantage of this approach is that it raises the possibility of overvaluation of the unit cost of production C_x or C_y which would result in a negotiation *ex post*.

4.3. A Model for Contract Farming

Outgrower schemes have been used mostly in the developing world and have shown a great variety with their hybrid structure and

⁷ Ratio = $\alpha/(1-\alpha)$ From equation (5) $\alpha = P_x/P_y$ then $\alpha/(1-\alpha) = (P_x/P_y)/(1-(P_x/P_y)) = P_x/(P_y - P_x)$.

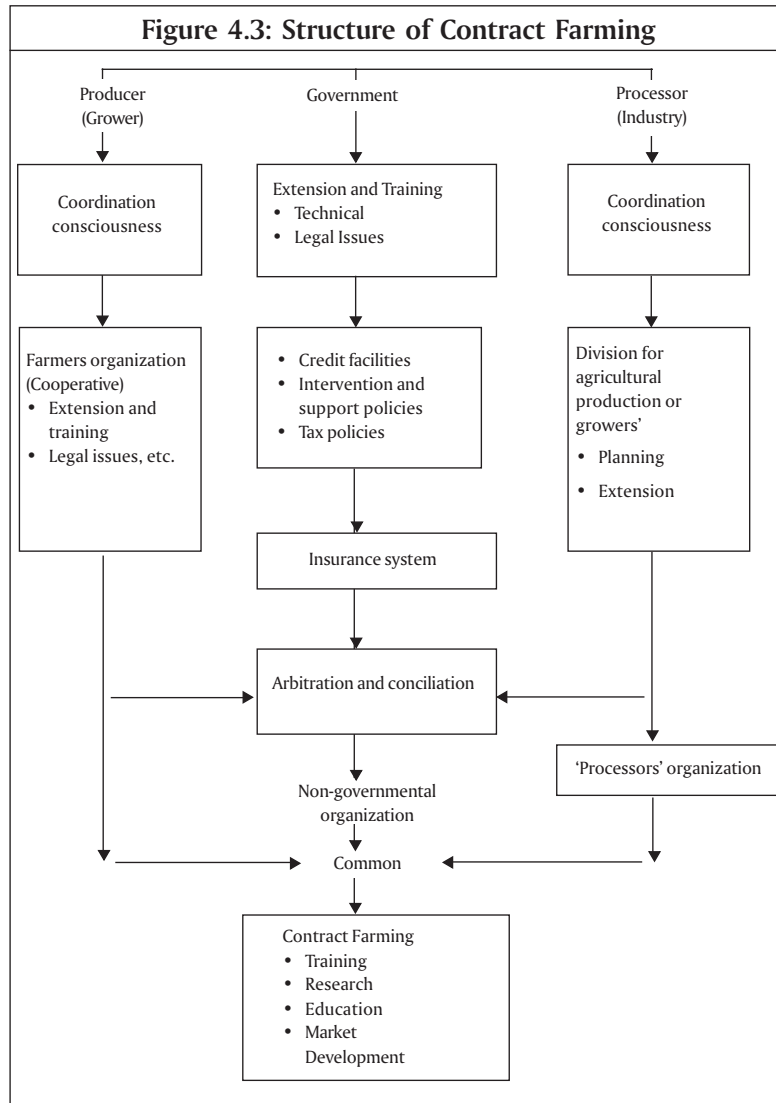
multiple objectives. Therefore, it is not easy to point out a standardized form for those schemes. A simplified model is discussed here for a standard private contract arrangement to have a fair and successful implementation of contract farming for farmers and integrators, agricultural sector and whole national economy (Figure 4.3).

These explanations can also be evaluated in relation with contracting schemes if private contracts are considered as a part of contracting schemes for the sake of practical purposes.

First of all, both producer/grower and integrators (handler, processor etc.) must have collaboration consciousness. Both for the producers and processors, it is important to have established reputation for honesty and fair dealing. That means farmers should look at integrators as partners, who are working for them, rather than rivals, and also the same behavior is expected from the integrators. Both sides are in need of each other in order to make a contractual relationship which operates for their mutual benefit. Otherwise, this cooperation would be always a source of dispute and dissatisfaction.

In contract farming systems, the individual producer has perhaps had many reasons to feel weakness in his market power. However, the history of agriculture producers demonstrates that growers have been seldom rewarded appropriately in the market place due to weakness in their states as farm entrepreneurs compared with other participants in the food industry.

That is why it is very important for the producers to act in an organized manner. Recognition gained by organized groups is better as opposed to the lack of recognition accorded to unorganized farm producers (Anderson 1994). Organizing a bargaining cooperative among farmers makes them rather powerful in a contracted relationship (Scheid 1991, Moore 1994).



Such an organization also could give opportunity to collaborate with the integrators' organization. The producers and processors could act together. For example, the California Tomato Growers Association needed to take a more active role in controlling imports.

This led to the formation of the National Association of Growers and Processors for Fair Trade (Marcus and Frederick 1994). This attempt was successful in imposing some regulations on imports and in other aspects, such as market development, political action, making adjustments to consumer demand, etc. Of course, these local bargaining organizations are to be organized on the national level. But in practice, under such organization, the level of negotiation is an arguable problem. It could be said that, in general, the collaboration and negotiation between farmers and processors might be better carried out in a decentralized way, at firm level. A nation-wide farmer and food industry organization could act as an administrative organism. It could retain a role as arbitrator and guarantee the application of private agreements. Experimentation, development of reference and agricultural techniques would probably be the responsibility of central body. Experiences in France have shown that, between 1961 and 1990, considerable shifts had emerged to decentralize the contracted economy from national level negotiations which were having difficulty at reconciling industrial and marketing coordination (Valceschini 1995).

In contractual arrangements, the role of the integrator firm is very important in determining the majority of the production and marketing practices and measures. Therefore, the efficiency of the firms' activities directly affects the efficiency of contract farming. The first step in successful implementation is organizing a sound organizational body. Contracts could vary from company to company, but all of them must have a special unit which deals with all contractual issues and is equipped with necessary staff and equipment. The relationship of this unit with the other functions of the firm must be determined clearly (Brown *et al.* 1994).

The role of government is an important factor for successful application. The first function in retained state authority might be

legislative arrangement. In agriculture, with a tremendous variety of production enterprises, it is not possible to put out comprehensive contract models which have strict rules. Instead, government could determine a framework for a contract and enact some regulations to solve disputes and take part in such arbitration to some extent. The most direct way for the government to address production contract issues is to regulate them specifically. Both in Turkey (national level) and in the USA (some states), governments have begun to regulate contract relationships either by establishing requirements or by requiring that legal disputes go through mediation before one party can take the issue to court. Governments can also mandate the submission of annual reports by contractors to gather more information about contracting. Registration or certification of certain entities that engage in contracting can also be made obligatory. For instance, licensing enables the government to control the use of certain practices more directly and to require the use of standardized contracts.

Besides, this direct role of the government in contractual mechanism, agricultural support and intervention policies, which aim at improving agriculture could be effective and functional through contractual relationship. For instance, in the USA the bargaining strength of farmers is reinforced by marketing orders regarding some products. In the European Union, according to the Commission Regulation, for some products the production aid system is based on contracts between producers and processors and the particulars to be included in the contracts for the purposes of the aid system should be specified (Anonymous 1984).

Tax policy is an aspect which must be considered to promote contract farming. Contract farming is a way of recording systems of production. Farmers are presently reluctant to gain on arrangements for fear that they have to pay more taxes. Therefore,

adopting a tax policy which facilitates and remedies the situation could be recommended. On one hand, specialization to produce a single product through contract farming has been increasing the profitability level; on the other hand, it will increase the risk farmers face. Agricultural crop insurance policy could be a considerable way to promote reducing risks for both farmers and firms.

Ineffective extension and training policies of the governments could be improved through contract farming.

Credit policies in agriculture also could be realized by contractual arrangements that consider the contract itself as collateral.

It is recommended that there should be an independent organization to resolve disputes between firms and farmers which are the major causes of failure in contract farming. For solving the disagreements and disputes between producers and processors over quality standards, delays in delivery and payments and default on loans and the like, going through the court systems created long delays, thus a mediation or a conciliation system would be useful (Spolter 1992) by involving government and non-governmental organizations' representatives.

Because of the multi-party involvement in the contracting schemes, the need for development of close coordination and partnerships among various actors, not only farmers, contracting firms and government but also other institutions such as public and private credit agencies, national and international donor organizations, national extension system and higher education and research organizations must be underlined for a fair contracting implementation. In this structure, monitoring and assessment of impacts of contracting both at firm and macro level are rather important. For this activity a participatory approach especially including representatives of small farmers could be beneficial (Porter and Howard 1997).

Conclusion

The agro-food sector from producer to consumer involves a range of discrete and complementary activities changing from farm input procurement to consumption. The vertical relationships or coordinations between these activities change from open market transactions to vertical integration. Because of the changes in food consumer preferences and attitudes, technological improvements, food safety issues and related regulations, impersonal and open-market transactions between activities in traditional agro-food systems based on price signals are replaced by rather controlled impersonal vertical coordination mechanisms such as organizing cooperatives, short- and long-term contractual relationships, and ownership integration in the advanced and industrialized systems. In addition to the reasons mentioned above, recent sophisticated ideas such as environmentally sound, sustainable agriculture, standards and regulations related to environment, and health are the initiatives behind the fast growing close vertical coordination.

Contract farming as one of the alternatives of vertical coordination has gained importance in last decades. Contract farming is a continually evolving process. World-wide applications of contract

farming have shown that the terms of the contract are shaped to match their own unique conditions and have varied from product to product, and that the experiences of each country differ from others. Product characteristics and regional and national differences have to be considered in related analysis and evaluations. Product characteristics of the agricultural commodities are the main determinants of the form of vertical coordination. While some products such as poultry are handled in a fully coordinated contract system, some products such as grain are still subject to market transactions. There are national and regional differences. For example, while the industries such as poultry are more or less homogenous, they show different governance structure in different countries. Hence, when analyzing contract farming, out-grower schemes or multipartite arrangements in the third world have to be considered alongside the implementations in developed countries.

Investigated theories contribute to our understanding of the determining factors, motivations behind, and consequences of different forms of vertical coordination in the agro-food sector. The issues of vertical coordination can be easily understood and analyzed in the light of a combination of different and sometimes overlapping approaches. In other words, the theories presented in this book reflect different facets of vertical coordination and can be thought of as complementary to some extent. In the light of investigated theories, one of the main reasons for vertical integration is transaction costs. Vertical coordination through ownership integration decreases transaction costs but creates its own costs. Some distinctive features inherent in the production of agricultural commodities and markets favored the use of contractual relationships in agriculture versus full-integration (ownership integration). However, even in ownership integration, internalizing all transactions in a firm does not avoid the use of contracts, i.e., a firm can have all production

assets or have complete control of them, but need to hire labor and use labor contracts. On the other hand, specialization in one of the stages of the agro-food chain can provide cost advantages. Therefore, coordination among the specialized firms through contractual arrangements or even open-market relationships may be more efficient than in ownership integration. A guaranteed market, easy access to credit facilities, and information are among the reasons for producers getting involved in contract. For integrators, the main reason is to provide a steady input supply with a guaranteed quality and quantity.

Besides the advantages of contract farming to both sides, there are some disadvantages as well. That means that contract farming could create some problems, such as losing some degree of independence for the farmer, creating a monopsony position, etc. In general, one of the significant reasons for contract production is to decrease uncertainties (risks) both for farmers and integrators. Under contract integration, producers bear some of the production risks, but price risks for the contracted commodity and most variable inputs are transferred to the integrator. However, the reduction in producers' and integrators' risks are replaced by other risks and problems related to the implementation of contracts. For example, integrators can force changes in operation at will since there are no contract provisions to prevent such changes. For integrators, the inability of producers to meet the technical requirements of contracts, quality problems, disputes related to payment and other contract terms, and *ex post* contract negotiation are primary concerns and sources of risk.

In practice it is not possible to have a complete contract because it is not possible to foresee all contingencies in advance (bounded rationality). It is difficult to describe and write these contingencies accurately and there will be a cost for writing down such a plan

and realizing it and solving disputes. In practice, contingencies that have not been planned inevitably arise. In this case, parties must find ways to adapt. These adaptations introduce the possibility of opportunism. In general terms, incomplete characteristics of the contracts lead to problems of imperfect commitment. Under information asymmetry, there will be a moral hazard problem which limits the contracts that can be written and enforced.

Asset specificity, task programmability and separability are primary determinants of the degree and type of vertical coordination (governance structure). In the contractual relationship, the length and the comprehensiveness of contracts depend on the above features. In the case of high asset specificity that cause sunk cost may create a hold-up problem.

Of course, some measures could be taken to outweigh these disadvantages of contract farming. Having a coordination and collaboration consciousness and acting in an organized manner for both sides is advisable for a successful implementation. In contract farming, the role of successful management (strategic management) is very important for efficiency as in every kind of vertical coordination. Establishment of a sound relationship between involved parties based on trust, confidence and mutual understanding is a critical issue in financial and economic efficiency. Legal and/or incentive systems based on reward and penalties can be used, creating trust and mutual confidence. The desired method is availability of coordination consciousness that the processor (principal) needs a group of producers (agents) as much as the producer needs the processor as explained in the presented cooperative model. Quality and quality control is one of the important issues in every stage of the agro-food chain. A quality convention is required among the transaction parties in these stages. Quality requirements can be best defined and controlled by a third

party, government and/or independent organizations along with the internal convention in the food chain.

In contractual arrangements, the role of the integrator firm is important as it determines contract terms (most of the production and marketing practices and measures). Therefore, the efficiency of the firms' activities directly affects the efficiency of contract farming. The first step in successful implementation is establishing a sound organizational body in the contractor firms. Contracts could vary from company to company, but all of them must have a special unit dealing with all contractual issues equipped with necessary staff and equipments. Also, its relationship to the other functions of the firm must be determined clearly.

It is recommended that there should be an independent organization to resolve disputes between firms and farmers, because these are the major causes for failure in contract farming. Solving disagreements and disputes between producers and processors creates long delays while going to court. In some cases arbitration is used as a way of conflict solution. In arbitration, an arbitrator renders a decision and third party imposes it, taking all the control away from the parties. Thus, mediation or a reconciliation system would be useful by involving government and non-governmental representatives.

One of the clear findings of the reviewed studies is that the fewer and larger processors have created a monopsonistic, anti-competitive market structure. Having title of the products (broiler industry), market information and production know-how as well as large market shares, strengthen their position in the market against farmers. In such structures the individual farmer is in a weak position at the bargaining table. Antitrust oversight and related legislation may be seen as the first attempt to cope with the anti-competitive effects

created by processors (integrators). The necessity of such attempts are not deniable, but it is a fact that it is not possible to control and regulate economic systems in every case.

One possible alternative for farmers is to forge alliances among producers and to establish processing and marketing cooperatives as in Turkey and the USA. These directly assure access to available markets and enhance net returns. Availability of producer cooperatives in the market as an alternative also creates a countervailing power when facing the corporate monopsonistic behavior. It was observed in beet sugar industries both in Turkey and the USA that vertical integration of some processing companies by growers had real efficiency consequences.

Another significant way of strengthening farmers' bargaining power is the establishment of bargaining cooperatives, as in the USA. Organizing a bargaining cooperative among farmers makes them rather powerful in contractual relationships. Such an organization could also give an opportunity to collaborate with the integrators' organization. The producers and processors could act together. For example, the California Tomato Growers Association needed to take a more active role in controlling imports. This led to the formation of the National Association of Growers and Processors for Fair Trade. This attempt was successful in imposing regulation on imports and in other aspects, such as market development, political action, and making adjustments to consumer demand.

This new relationship between farmers' organization and the integrator could be explained by the theory of bilateral monopoly. Bilateral monopoly has been subject of considerable theoretical and empirical studies since Brandow (1928). Some scientists indicate that, in the product markets, bilateral monopoly tends to establish a determinate output which equals the competitive output. On

the contrary, some others suggest that output, which maximizes joint profits of two groups in the society, would not usually be the same as that which maximizes the profits and surpluses of society as a whole.

In the case of joint profit maximization, if quantity is considered as determinate, the question simply is to determine profit shares or the price of the intermediate raw material. The widely advocated Nash cooperative solution implies that under the assumed conditions, the profit would be allocated equally between the two stages of production. It can be proposed as an alternative practical way to divide maximized profit between grower and processor based on their shares in the total production costs, despite having some estimation and overvaluation problems.

Although contracting needs government involvement in all countries, it must be underlined that the role of government is highly important in all contracting schemes in developing and less-developed countries. Improving the rural infrastructure, issuing direct and indirect regulations in favor of small-poor farmers under the fair trade practices, aiming at the securing of food sovereignty and safety, encouraging the development of domestic markets and farmers' organizations etc., could be addressed as major responsibilities. When evaluating and monitoring those schemes, a project evaluation approach must be applied, considering the benefit and costs of all stakeholders. Expenditures for consultancy and expertise from the planning period to the end of these schemes have to be included in total project costs. While the role of the government is an important factor for successful implementation, it is not possible to establish a comprehensive contract model that covers a variety of enterprises in agriculture via legislation. Instead, the government could determine a framework for the contracts and enact regulation to solve disputes.

The most direct way for the government to address production contract issues is to regulate them specifically. In some countries as in Turkey (national level) and in the USA (some states), governments have begun to regulate contract relationships either by establishing requirements, or by requiring that legal disputes go through mediation before one party can take the issue to court. The government can also use indirect methods to encourage or facilitate contract producers' abilities to organize and bargain for more favorable contract terms as in some States of the USA.

Governments can also mandate contractors to submit annual reports to elicit more information about contracting. Registration or certification of those entities which engage in contracting should be made mandatory. For instance, licensing enables the government to control the use of certain practices more directly and to require the use of standardized contracts.

In addition to the general conclusions summarized above, some specific measures could be proposed to have a more industrialized and vertically coordinated agro-food system and well functioning contract farming:

- Major structural changes have been going on in our changing world. For example, the rapid development in electronic information and communication technologies seems to make considerable changes in both inter-firm and intra-firm relationships (e-commerce). On the other hand, strict quality requirements, environment friendly approaches to production and marketing, such as traceability have been reshaping the agro-food structure. These changes in agricultural production and marketing, consumer preferences and technology have been accelerating the movement from market transactions to a tighter vertical coordination as contracting or full

integration. New closer vertical coordination ways create new conditions and problems to investigate. There is a need for more comprehensive empirical studies (commodity level) to better model the structure and related problems of vertical coordination and contract farming.

- Collection of nation-wide data related to the different aspects of contract farming has to be included in the General Agricultural Census as in the USA.
- Government resources used in ineffective ways such as for price support, input subsidy and selective credit policies should be devoted to establishing a sound marketing and processing infrastructure through organizations which are owned and controlled by the producers.
- The direct involvement of the government in farmers' interest economic organizations (Cooperatives) must be replaced with indirect support policies. Available cooperatives should be reformed so that the producers have control over their cooperatives.
- Government policies regarding tax, credit, agricultural insurance and especially extension, must be evaluated to create a convenient environment. For instance, in the USA, the marketing orders have been strengthening the farmers' position in the contractual relationships.
- Both producers and integrators have to improve their understanding and attitude about contracts and contractual relationships. Each has to be informed about the legal and technical issues related to contract farming through farmers' organizations or efficient government extension programs.

Contract farming is not a panacea to solve all related problems of agricultural production and marketing systems. However, this

way of coordination could be evaluated as a way of providing easier access to credit, input, information and technology and product market for the small-scale farming structure. Contract farming also contributes to the development of a sound food industry. It might also be seen as a way toward, or as a part of rural development and can be promoted to improve agricultural performance, especially in the Third World Countries. Contract farming could be evaluated as a form of structural convergence between developed and Third World agriculture and also a way to achieve a higher synthesis between agriculture and industry.

Finally, it can be concluded that contractual relationships are not only a distinctive feature of highly industrialized agro-food systems, but also a way of establishing an industrialized and developed structure. But, to obtain the advantages of contract farming, the necessary measures must be taken to trade off those disadvantages, such as the exploitation of small farmers and natural resources by domestic and foreign corporations and multinationals.

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