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Contract Farming as an Institution for Integrating Rural Smallholders in Markets for Livestock Products in Developing Countries: (I) Framework and Applications

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Summary

This report provides an overview of the theoretical underpinnings of the emergence of contract arrangements versus reliance on spot markets. Transaction costs economics is the dominant school of thought in the literature on contracts, particularly with respect to the rationale of firms to vertically integrate instead of engaging in direct exchange in the open market. Vertical integration and other forms of exchange organisation are traced to the objective of economic agents to reduce transaction costs in an environment where market imperfections predominate and economic agents behave opportunistically.

A spectrum of contract types is presented as framework within which to assess contract farming as a market institution. Applications of contract farming in agriculture are then identified and how characteristics of economic transactions lead to particular contract arrangements is laid out. Contract farming can be situated within three 'hybrid' transaction coordinating mechanisms that lie between the two extremes of the spectrum represented by spot markets ('Invisible Hand') on one side, and full vertical integration ('Hierarchy') on the other. The various contract farming schemes address particular product and transaction characteristics and are an attempt to overcome different forms of market imperfections or incompleteness in markets.

In general, the diffusion of contract farming schemes in developing countries appears to follow agricultural commercialisation as symbolized by the spread of the supermarkets. These schemes started as adoptions of contract farming templates from industrialised countries, which were subsequently gradually modified to accommodate local institutional realities.

1. Introduction

The commercialization and globalization of agriculture has brought about opportunities for improved incomes for rural households in developing countries through new possibilities to supply higher-value products such as meat and milk products in markets of the growing urban centres in the developing countries themselves. Accompanying this phenomenon is the increasing demand for particular product characteristics, such as quality, food safety, as well as concern over production processes, for which product and process standards and certification mechanisms are increasingly coming into play. To gain access to these high-end markets, rural smallholder livestock keepers need to gain the capacity to produce at such standards, as well as the necessary market institutions to guarantee the acceptability of their products. The inability to do so due to market failures or/and failures in the provision of public goods, 'mis'-configuration of supply chains and the accompanying developments in product and process standards, impose barriers on rural smallholders, and exclude them from access to the very markets in which the demand for meat and milk products are rapidly expanding. Within this context, contract farming has, in recent years, been presented as a potentially effective market-oriented institution to bridge the gap between the rural smallholder producer's resources, assets, and capacities on the one hand, and the increasingly stringent demands of the consumers on the other.

In partnership with the University of the Philippines Los Baños, PPLPI initiated a research project entitled *'Contract Farming and Other Market Institutions as Mechanisms for Integrating Smallholder Livestock Producers in the Growth and Development of the Livestock Sector in Developing Countries'* to assess the efficiency and effectiveness of contract farming and other market institutions in assisting rural smallholder livestock keepers to gain access to markets for livestock products in developing countries.

This brief report summarizes the theoretical rationale of contracts, the general applications of contract farming in agriculture, and the diffusion and configuration of contracts in developing countries. The aim of this report is to outline the framework for a subsequent analysis of the extent to which contract farming schemes have improved access to markets for rural smallholder livestock producers in identified case countries in Asia. Results of the latter will be presented in a companion report.

2. Analytical Framework for Transaction Costs

This work relied on an extensive review of the theoretical literature on contracts and transaction costs economics, and a review of the empirical literature on contract farming in developing countries in agriculture in general, and in livestock products in particular.

The theoretical underpinnings of the phenomenon of contract farming are traced to competing and complementing schools of thought in the economic theory of firm behaviour, property rights and agency behaviour, and industrial organization. In the literature on contract farming, the dominant theoretical framework is transaction cost economics (TCE), following the seminal works of Coase (1937) and Williamson (1979; 1985; 1989), and expounded on by the proponents of the New Institutional Economics (NIE) school, which extends economic theory by giving recognition to the important role of the social and legal norms and rules that underlie economic activity.

Traditional neoclassical economic theory assumes that under conditions of perfectly competitive markets, anonymous economic agents, in the act of voluntary market exchange in pursuit of their own interest, arrive at independent decisions that result in the maximization of gains from trade. Under this environment, the price mechanism bridging supply and demand decisions provides all the information that economic agents need. Transaction costs are ignorable, and the 'Invisible Hand' of the market will coordinate individual actions so as to arrive at a socially efficient welfare maximizing solution. Under these conditions, it is in the interest of economic agents to transact everything through classical market transactions (spot market).

In contrast, TCE asserts that economic agents are rationally bounded (there is incompleteness and asymmetry of information) and tend to be opportunistic. Under these conditions, market transactions are fraught with hazards, and measures undertaken by economic agents to mitigate the losses entail costs – transaction costs. The level of transaction costs is influenced, among others, by three transaction characteristics: uncertainty, asset specificity, and frequency of exchange. Where there is uncertainty on the probable action of the other party in an exchange transaction, assuming opportunistic behaviour, transaction costs ensue in undertaking measures to search for more reliable trading partners, negotiating for better terms, and enforcing agreements.

Asset specificity occurs when an economic agent undertakes an investment to engage in a particular economic activity meant for a particular market exchange. While the value of the asset is maximized in that exchange agreement, its value diminishes outside that particular transaction. The undertaking of highly specific investments is prone to 'hold-up' situations when an opportunistic partner to the trade reneges on the agreement for the purpose of extracting quasi-rents. Measures to protect the value of specific investments entail transaction costs.

Frequency of exchange, by itself, does not provide a unidirectional relation with the level of transaction costs. When dealing with homogeneous goods and services produced through the use of non-specific assets, it does not matter much if the exchange only occurs occasionally, or the exchange is recurrent. For such products, all information is provided by the market and exchanges can be made whenever the occasion demands, and consequences are borne by

each party without incurring high transaction costs. However, when investments in are made in specific assets on the expectation of longer-term exchange relations, the repetition of successful transactions generally leads to greater trust and stability of the relations, reducing transaction costs.

TCE asserts that when transaction characteristics are such that direct market exchange entails prohibitively high transaction costs, it is more efficient for a firm to produce the good that it requires for its own economic activity, i.e., to vertically integrate. The decision to organize economic transactions either directly through spot markets ("buy") or by vertically integrating ("produce"), however, are two extremes, and are not the only options available to economic agents.

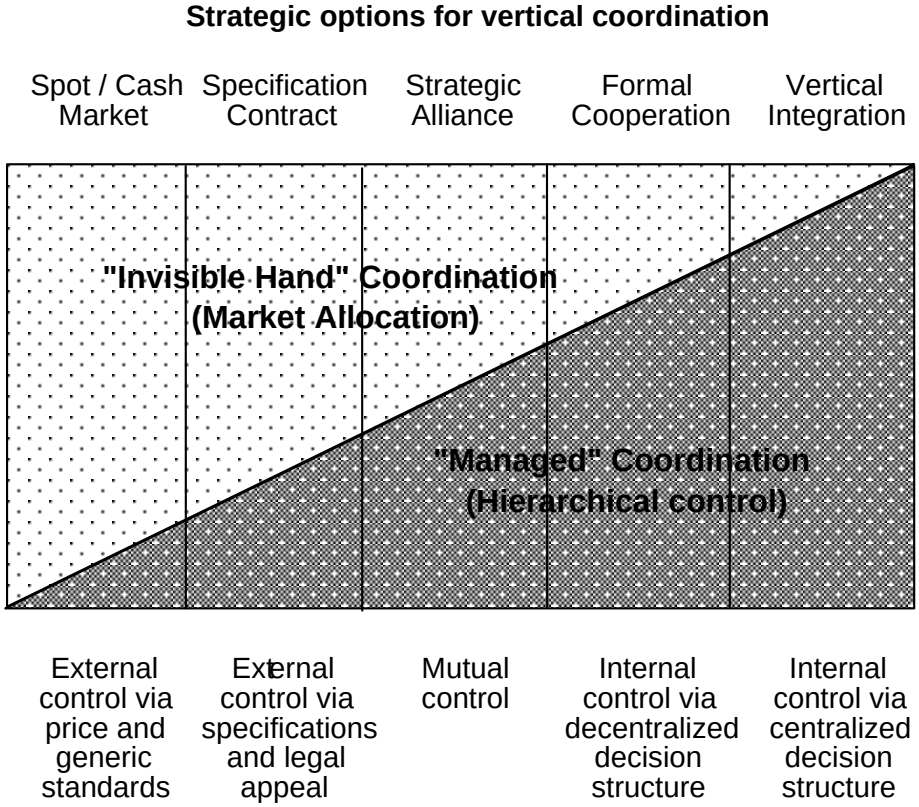
The development of the TCE literature has led to the construction of transaction coordination models between these two polar points, generally termed as "hybrids". Peterson and Wysocki (1997), modifying earlier versions of categorising the organisation of transactions, present a succinct arrangement of five strategic options for transaction coordination, varying in relative importance of the market mechanism ('Invisible Hand') and internal ('hierarchical') control. These forms are as follows: (i) Spot market, (ii) Specification contracts, (iii) Strategic alliance, (iv) Formal cooperation, and (v) Vertical integration. These options, together with their respective primary coordinating mechanisms, are illustrated in Figure 1 below.

Along this framework, TCE asserts that profit-maximizing agents, with the production technology at their disposal (and the underlying production costs) and transaction characteristics of the exchange (and the entailing transaction costs), will choose a particular organization of economic activity that minimizes the sum of production and transaction costs.

The TCE approach to explaining contracts, however, is not without criticism from other schools of thought, particularly on the emphasis on transaction costs. Since transaction costs are not tangible, they don't lend themselves to direct measurement for verification. TCE appears to ignore the impact of trust and the "evolution of human behaviour in a recurrent contracting situation in the manner that is taken up by "social exchange theory"[1]. Notwithstanding the criticisms, the TCE remains the dominant approach used in the literature on contract farming.

[1] For more detailed citation of the authors that questioned the validity of the TCE assumptions on this issue, see Sartorius and Kirsten (2007).

Figure 1. Alternative options for transaction organization.



Source: Peterson and Wysocki, 1997

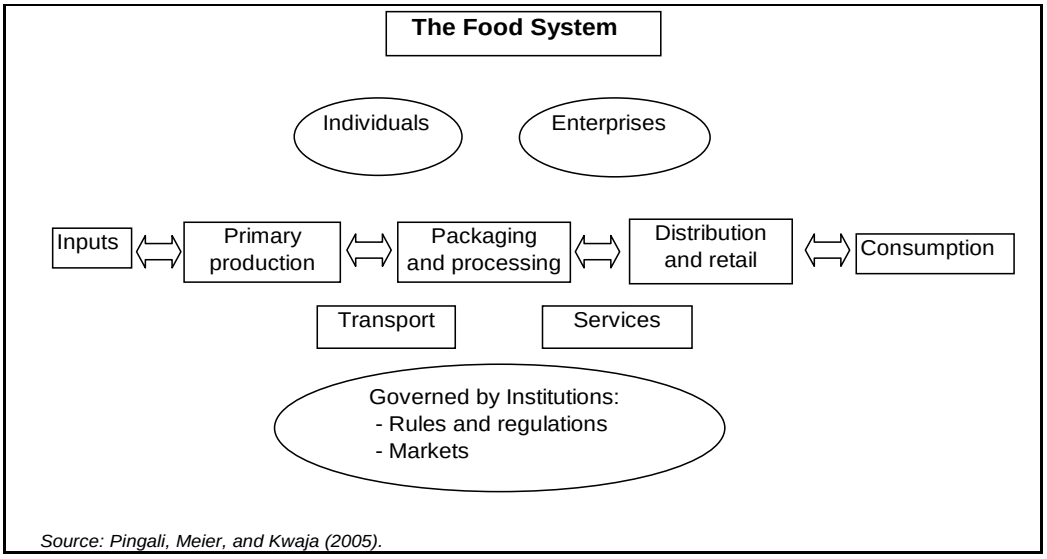
3. General Applications of Contracts in Agriculture

The current literature on contract farming builds on the more general literature on the emergence of supply chains in the context of the growing commercialization of agriculture in developing countries. Among the main drivers of this transformation are the changing demand conditions brought about by increasing *per capita* incomes and urbanization. These in turn bring about changes in the composition of the food consumption basket (diet) with increasing demand for higher-value products, product quality, food safety, and convenience. On the supply side are technological changes toward more efficient farm production and food processing, exploiting economies of scale where they exist. Both changes in demand and supply conditions are taking place within the globalizing trade environment, through which industrialized and developing country markets are becoming more closely integrated. On the distribution side, the emergence of supermarkets in developing countries has created innovative and more efficient forms of

procurement of agricultural products. These innovations are also facilitated by advances in information technology.

The modernization of supply chains and their linkages to major urban and export markets has induced new relationships between processing enterprises and individual farmers. Pingali *et al*. (2005) argue that agricultural production processes, except for purely subsistence farming systems, are now increasingly linking input suppliers, processors, distributors of the final products, and consumers, which demand particular attributes of farm products, via supply chains (see Figure 2). Apart from improving efficiency in product transformation, a key to greater competitiveness is the reduction of transaction costs associated with each stage. This would consequently entail a new set of rules and regulations for the governance of the entire chain.

Figure 2. Modern food systems: supply chains, actors and links along the chains.



Source: Pingali, Meier, and Kwaja (2005).

In the commercializing and globalizing agriculture, the drivers of structural change induce a movement from markets for homogeneous traditional commodities towards markets for specialized or highly differentiated goods. Engagement in the production and exchange of differentiated products with specific product characteristics has implications that are likely to lead to new configurations of transaction costs.

Applications of contract farming in agricultural supply chains in developing countries are found in transactions dealing with high-value products such as fruits and vegetables, destined either for export markets or supermarkets in urban centres. Perishability and related characteristics of quality generate uncertainty in the transactions. Perishable products must be moved quickly and transacted frequently. When product quality becomes an important issue in market exchange, a buyer is confronted with uncertainty over the product quality, particularly when quality is not readily recognizable, and known only when the product is subsequently processed or consumed.

On the other hand, the seller is likewise confronted with the risk of not receiving a price premium for supplying a higher-than-normal quality of product. When the spot market fails to recognize product differences, and fails to award proper price premia to higher-quality products, economic agents will look for other governance mechanisms that more efficiently solve the problems posed by uncertainty.

The production and marketing of differentiated products catering for particular preferences of higher-income urban consumers or export markets also induce the asset-specific investments for the production and supply of these products. Having made such investments, however, subjects the investor to risks of exploitation by opportunistic behaviour of trading partners. Managing such risks stimulates the search by agricultural enterprises for governance mechanisms that lower transaction costs.

The problems posed by transaction costs pose a particular challenge in less developed country settings where, in general, the marketing and institutional infrastructures and services that link various parts of the supply chain for agricultural products are not smoothly functioning. These costs constrain the flow of goods from farms, particularly those located in remoter rural areas, to the major centres of demand. To remain competitive in the changing agricultural market environment, firms must find governance structures that enable greater control over production, processing and distribution functions. Firms accomplish this by either full vertical integration, engaging in strategic alliances (partnerships), engaging in a merger with the enterprise with which it had previously been engaging in a market transaction, or by engaging in contracts with farmers.

Sartorius and Kirsten (2007) expanded on the basic framework of Peterson and Wysocki (1997) on the choice of transaction organization and extended it for application in agricultural food systems to explain the choice of governance mode by an agribusiness processor. Using the basic transaction characteristics of frequency, asset specificity, and uncertainty in the TCE framework, and then expanding on the various elements of uncertainty, the corresponding organizational forms of transactions are identified. Focusing on the three ‘hybrid’ forms of vertical coordination between the extremes of spot markets and full vertical integration, the organizational forms are identified according to measures of the intensity of various transaction characteristics considered. An abridged adaptation of the framework of Sartorius and Kirsten (2007) is given in Table 1. The transaction characteristic of uncertainty is broken down to eight elements, which take into account the characteristic of the transaction itself, the ability to control elements of the contract, as well as uncertainties that agro-ecological factors could impact on the ability to deliver when engaged in an agricultural production activity.

Table 1. Transaction cost framework for agricultural value chain governance structures between spot markets and full vertical integration.

Contract / Transaction Characteristics	Governance for Vertical Coordination		
	Neo-classical contracts[a]		Bilateral relational contracts[b]
	Specification Contract	Strategic Alliance	Formal Bilateral Cooperation
1. Frequency	Low / medium	Medium	High
2. Asset specificity	Low / medium	Medium	High
3. Uncertainty			
• *Ability to walk away / Switching cost*	Yes / lower	Less / lower	Low / higher
• *Availability of substitutes*	Yes / less	Less	No
• *Duration*	Short / medium	Medium	Long
• *Ex ante control (contract conditions and costs specified up front)*	Medium	Low	No
• *Ex post importance (managing other conditions as they come)*	Low / medium	Medium	High
• *Information sharing*	Low / medium	Medium	High
• *Contract enforcement*	Legal-complex	Complex	Bilateral
• *Agro-ecological risk*	Low / medium	Medium	Medium / high

[a] In neoclassical contracts, contract farmers generally retain their own identity as partners to the agreement.

[b] In bilateral relational contracts, individual farmers as partners, are generally accorded an "equal footing" status by the integrator.

Source: Adapted from Sartorius and Kirsten (2007)

Sartorius and Kirsten (2007) caution that the choice of the mode of transaction governance according to transaction characteristics within the TCE framework should not be taken deterministically, where a combination of transaction characteristics yields only a single efficient governance mode. Even in risky situations, the element of trust between transacting parties modifies the effect of transaction characteristics on the governance choice. The higher the trust, the greater the suitability of more decentralized governance structures (e.g., towards more decentralized neoclassical contracts). Conversely, the lower the trust between parties to the transaction, the stronger the tendency for hierarchical or relational contracts.

Using Table 1 as a starting point in locating the various contract farming schemes reported in the literature along the spectrum of transaction organization for vertical coordination, most of the production or/and marketing contracts in developing countries appear to fall under the general category of 'Neoclassical contracts' rather than under 'Bilateral relational contracts'.

The literature on contract farming, indeed, reveals that the degree of autonomy granted to contract farmers depends on the nature of production or marketing coordination problems that need to be addressed. The classification provided by Minot (1986) with three types of contracts addressing particular categories of market failure is instructive. These are described below:

a) *Market specification contracts* – address failures arising from marketing information asymmetry with respect to location of particular markets, product quality required, timing (seasonality) of demand, and movement in prices offered. The contract allows greater exchange of information on the above items, with both the farmer and the buyer (or intermediary) benefiting from the price premium on the quality and stability in the flow of supply of products to specified markets.
b) *Management-providing contracts* – address failures arising from production information asymmetry with respect to technology that could improve farm profitability by raising product quality and control of timing of supply. The contract allows the buyer (intermediary) with the information to specify and assist the farmer in the execution of least-cost production practices to attain higher quality and control timing of output. The buyer recoups the costs of extension from the proceeds of marketing a higher-quality product according to the timing of demand.
c) *Resource-providing contracts* – address failures arising from imperfections or incompleteness in the markets for credit, inputs and/or agricultural services. The contract allows the buyer to supply the proper inputs on credit and corresponding technical assistance in their use. The provider is assured repayment by the contracted party through marketing of the product.

Comparing the characteristics of each of the types of contracts addressing various types of market failures and the general categories of contracts according to transaction characteristics in Table 1, Minot's 'Market specification contract' closely resembles the 'Specification Contract', with low-to-medium intensities in terms of frequency of transaction, asset specificity and uncertainty. The main 'input' provided by the buyer or intermediary is in the communication of valuable market information that allows both contracting parties to profit from the supply of a higher-value product.

Minot's 'Management-providing' contract appears to more closely resemble a Strategic Alliance. The exchange of production-related information is more intense, and the contractor gets more

deeply involved in the production process at the farm level through the extension of technical services in order to ensure that the desired product quality is achieved, and that timing of supply is scheduled according demand. To obtain the desired final product, both parties must bear the risks of asset-specific investments in production and processing, and both activities must be synchronized.

The third contract type defined by Minot, the 'Resource-providing' contract, representing the highest degree of market intermediary control over the production process at the farm level by having proprietary rights over inputs, technology, and output, does not fit into the category of 'Formal Bilateral Cooperation'. However, this degree of hierarchical control could very well approach that of full vertical integration, depending on the degree of market power of the intermediary or integrator. Where the bargaining powers of the farmer and the intermediary-resource provider are relatively balanced, and both work to provide their respective expertise (comparative advantage) to make best use of their asset-specific investments, the relationship can be transformed into a Strategic Alliance.

4. Diffusion and Configuration of Contract Farming in Developing Countries

The documentation of contract farming as early as the first half of the 20th Century refers mostly to the engagement in vertical coordination by agribusiness enterprises in the industrialized countries of North America and Western Europe, particularly in the production and processing of vegetables and fruits. Contract farming in poultry, and then later in pigs, followed in the second half of the last Century. In the US, the poultry industry is now almost fully vertically coordinated via contracts with spot markets having disappeared. In the EU, contract arrangements have been encouraged under the EU Common Agricultural Policy, where the volume of output and quality of products is tightly controlled, particularly in highly perishable products such as dairy and poultry, fruits and vegetables. In Asia, the earlier adopters of vertical coordination in poultry production were Japan and South Korea.

In the less developed countries of Latin America, Asia, and Africa, the origins of contract farming are difficult to trace. Early practices of vertical coordination appear to have been related to the operations of trans-national agribusiness companies or state-owned enterprises in the plantation sector producing commodities destined for export markets such as banana, tea, tobacco, sugar, oil palm, and rubber. In the midst of the macro-economic structural adjustments programmes that quite a number of developing countries underwent in the second half of the last Century, government support to market intermediation in heavily traded commodities were discontinued, and many state-owned enterprises collapsed. The changing conditions in the global market for

commodities also induced the restructuring of the organization of agribusiness in plantation crops. From the operation of large single plantations, a shift in favour of production through contracts that reduced the risks to investments in large tracts of land and farm equipment by large agribusiness enterprises took place.

The more recent spread of contract farming in developing countries appears to have followed the path that Reardon and Timmer, 2005[2] describe as the three 'waves' of diffusion of supermarkets by multinational agri-food companies in Latin America, Asia, and Africa. This link is not far-fetched as the diffusion of supermarkets also brought about the spread of new procurement strategies by these enterprises to secure the supply of a consistent volume of high quality agricultural products destined for urban centres as well as for export markets.

There are certain types of farm products that are more amenable to vertical coordination than others such as high-value fruits and vegetables, milk, or industrial poultry and pig meat. These products have one or more of the following characteristics: high perishability, high quality specifications, high labour intensity, and / or a high value-to-weight ratio. Generally, these products include those destined for export markets and products that require traceability and/or food safety certification even if they are destined for domestic markets.

5. References

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[2] Reardon and Timmer (2005) indicate that the first wave covered much of Latin America and East Asia (except China), North-Central Europe and South Africa. In the early 1990s, supermarkets only accounted for 5-10% of agri-food retail sales. By 2000, supermarkets captured 50-60% of the agri-food retail market. The second wave of supermarket diffusion took place in the mid-1990s, covering parts of Central America and Mexico, Southeast Asia, and South-Central Europe, with the share of supermarkets in total food retail reaching about 30-50% by the early 2000s. The third wave of diffusion started in the late 1990s, affecting the big countries of China, India and Russia, and some countries in Central and South America, in Southeast Asia, and some in Africa. By the early 2000s, supermarket share of food retail had reached 10-20%.

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