CONTRACT FARMING

FOR INCLUSIVE MARKET ACCESS

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Foreword

Food manufacturers, modern retailers, food exporters and the food service industry are under tremendous competitive pressures. Large- and medium-scale firms in these increasingly concentrated sectors are using market power and alliances to establish market entry requirements. These firms have also been introducing procurement and supply chain management practices in order to gain control over supply processes and improve efficiency along the supply chains.

These changes in industrial organization and procurement are creating costs and technical requirements that are making it difficult for small farmers to access modern market channels. Since a rapidly growing number of firms – at least in modern market channels – are increasingly relying on contract procurement, a relevant question for development professionals is whether contract farming can be an effective institutional mechanism to enhance prospects for the participation of small farmers in the modernizing agrifood systems.

Modern agrifood systems imply strong competitive pressure for all value chain participants. The need to respond to demands from consumers, processors, retailers and transportation firms imposes stricter and stricter requirements for suppliers, in terms of quality, timing, handling and other delivery arrangements. Smallholder producers, representing the major part of global agriculture, are now facing the growing challenge of complying with these requirements. The issue of inclusiveness of smallholders in agrifood systems is not only a matter of efficiency of the systems but is also one of the key questions for the income and welfare of rural populations in developing countries. It is specifically for these reasons that consideration of effective institutional mechanisms to enhance the participation of smallholders in modern markets is at the forefront of FAO's agenda.

Contract farming is one such mechanism that has been widely discussed in world literature over the last few decades. It involves several aspects worthy of consideration: economic, institutional, social, legal, etc. The potential benefits of contracting for helping small farmers will depend, *inter alia*, on the product category and the requirements of the end market. Differences in potential benefits will also depend on country and local circumstances, including such factors as sector policy and availability of services.

Against this backdrop, FAO's book on contract farming for inclusive market access is a welcome addition to the body of knowledge on farmer to market linkages and on the roles of contracts in this regard. The book presents a range of cases covering different commodities and country contexts, competitively commissioned from researchers and development professionals worldwide, all of which illustrate the multifaceted nature of contracting as an agrifood chain coordination mechanism to promote inclusiveness and efficiency in supply chains. It also contributes to the treatment of conceptual issues in this general discussion and to the achievement of FAO's Strategic Objective Four: *Enable inclusive and efficient agricultural and food systems*.

In addition, in the introductory chapter, the editors draw a number of significant key messages that bring new contributions to the professional debate on the role of contracting in agrifood system development.

Contract farming will certainly remain high on the agenda of development professionals in the years to come, as can be inferred from the growing number of development initiatives that focus on contracting as an instrument to promote chain efficiencies and smallholder market linkages. It is expected that the issues discussed in this book will further inform the related policy design, implementation and impact evaluation.

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Chapter 1

Contract farming for inclusive market access: Synthesis and findings from selected international experiences

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1.1 INTRODUCTION

Efforts to fight poverty and promote food security in developing countries need to take into account that agriculture remains the major livelihood for large numbers of poor farmers and rural families worldwide. Smallholder agriculture in particular is the main source of the food consumed in many developing countries, engaging some 500 million farmers globally and providing an income source for an estimated two billion people (IFAD, 2011). While agricultural development interventions enhancing technology uptake can lead to improvements in productivity and contribute to farm output growth, converting product intensification into a sustainable source of farm income for this large contingent of producers means that attention also needs to be paid to the promotion of market access. Yet the challenges of linking farmers in developing regions to agrifood systems that are undergoing remarkable transformations globally should not be underestimated.

Indeed, changes in agro-industrial organization and in procurement models followed by traders, exporters, processors and other buyers of agricultural products are creating technical requirements and generating compliance costs that are making it increasingly difficult for resource-constrained farmers to access the more modern, potentially remunerative market channels. In response to consumer requirements and needs prompted by rising incomes, increased urbanization and other socio-demographic transformations, buyers demand more and more that farmers ensure supply regularity; adhere to stringent safety and quality standards; comply with logistical requirements; and change their traditional trading practices. In many circumstances, these demands effectively work as drivers to exclude poor farmers from the modernizing supply chains.

Approaches to link farmers to markets in inclusive ways have been the subject of growing attention by the Food and Agriculture Organization of the United Nations (FAO) and other development agencies for a number of years. Appraisals, case studies, consultations and other forms of knowledge generation have been

carried out, from which a number of lessons might be drawn (FAO, 2013a; GIZ, 2013a; Wiggins and Keats, 2013; FAO, 2007). Among these, the question of whether contract farming (CF) could be an effective institutional mechanism to enhance prospects for the inclusion of small farmers in modern market channels stands out as one of special relevance.

Recent years have seen a surge in publications on the CF topic, including journal articles, conference proceedings, books and other reports discussing theoretical concepts, case studies and research findings relating to technical, economic and social aspects.[1] Reviews of the vast literature that highlight the increasing prevalence of CF in developing countries have been presented recently by authors such as Prowse (2012), Bijman (2008) and Setboonsarng (2008), and previously by Singh (2002), Kirsten and Sartorius (2002), and FAO (2002), among others.

The present book adds to this growing literature. While several recent studies have considered the economic and social impact of CF on smallholder farmers (Smalley, 2013; Barrett *et al*., 2012; Bellemare, 2012; Miyata *et al*., 2009), this book's purpose is to characterize the extent to which CF is helping small farmers to access markets and meet increasingly stringent requirements – not only of "modern" food manufacturers, retailers, exporters and food service firms, but also in non-food sectors such as biofuels and forestry. These firms mostly produce differentiated, often branded and labelled products, in compliance with private and public sector quality and safety standards targeting global and regional markets. They may also provide import substitution for minimally differentiated and/or minimally transformed products for national or local markets, or produce goods requiring raw materials that, for processing efficiency reasons, must comply with special quality prerequisites.

In addition, the book seeks to clarify differences in the functionality of contracts depending on commodity, market, technology, public policies and country circumstances, by providing a series of nine diverse case study appraisals based on real world examples from developing regions. These case studies were competitively selected from scholars and development practitioners working in the field of CF by FAO, in collaboration with the International Association of Agricultural Economists (IAAE). Cases were selected from a range of commodities including livestock, food crops, bioenergy feedstock and forestry, in order to provide readers with an opportunity for cross-product comparisons of contract provisions and enabling environment factors. To achieve this objective, authors were requested to follow a predefined chapter outline covering the following salient points.

- Market conditions that lead to the need for contracting for the specific product category
- Background to the contract agreement between the parties involved
- Characteristics of the contract, including features associated with the flow of services and reciprocal obligations, price formulation and contingencies for contract failure
- Assessment of the effectiveness of contract arrangements in terms of how particular aspects of the contracts have helped smallholders to access more

[1] A sample of this literature is freely available from the FAO Contract Farming Resource Centre Web site: http://www.fao.org/ag/ags/contract-farming/en

remunerative, but also more demanding modern markets; the benefits for the contracting company; and risks involved for each party
- External factors that affect the likelihood of establishing and sustaining procurement contracts
- Recommendations on ways in which contracting could be improved for all parties
- Conclusions on the extent to which contracts have helped to enable small farmers to access markets by meeting the procurement requirements of modern supply chains

1.2 OVERVIEW OF BOOK CHAPTERS

The presentation of the nine cases in Chapters 3 to 11 of this book is preceded by an analytical chapter by Xiangping Jia and Jos Bijman. This provides both an explanation of the patterns and trends that are emerging in market organization and a synthesis of the theoretical arguments for the rise in CF. The authors propose a multidimensional framework for the analysis of CF that broadens the intellectual debate beyond the functional roles of contracts and the focus on CF as a transaction cost-reducing business model. They emphasize the need for a holistic perspective on CF that looks not only at the issue from the commodity perspective, but also includes consideration of the territorial and sectoral dimensions that give rise to imbalances in market power that may heavily influence the bargaining positions of partners involved in contracts. The social and political dimensions are also considered, to the extent to which they influence behavioural norms that have the potential to affect the sustainability of contractual arrangements.

The authors identify several additional themes requiring further elaboration in the CF literature. These include the employment effects of CF on- and off-farm; the distributional effects (i.e. equity and social dimension); and the interplay between agricultural production, market organizations and information and communication technology (ICT). They suggest that ICT has the potential to undermine the need for CF by reducing the importance of collective action and improving the services available to support spot and open market transactions. They conclude by noting that while the traditional reasons for CF (e.g. market failures for farm credit and inputs) continue to be important, the need to strengthen vertical coordination throughout the agrifood value chain has become the dominant explanation for the rise in CF in recent years. This argument has also been put forward by authors such as da Silva (2005). However, they caution practitioners to restrain expectations about the development potential of CF, by recognizing its locally embedded nature and the importance of adaptation of CF systems to address local contextual complexities.

Chapters 3 and 4 give examples of smallholder involvement in contracting in the livestock sector from Bangladesh (poultry) and China (pig meat). Both chapters claim strong benefits for smallholder farmers involved in contract arrangements when compared with non-contract farmers, not only in terms of net income but also in terms of increases in production efficiencies and the adoption of food safety and disease management practices. Similar market factors have given rise to the need for contracting, including increasing domestic demand, food safety scares resulting from disease outbreaks and the use of prohibited chemical inputs (e.g. "bird flu" and *clenbuterol* contamination) and supportive government poli-

cies encouraging transformation towards commercial farming practices. Contract features also show similarities in design. Provisions have been included to address specific market failures and provide incentives to smallholder farmers to reinvest in production systems by reducing risk (via embedded insurance) and guaranteeing market access.

In Chapter 3, Ismat Ara Begum, Mohammad Jahangir Alam, Sanzidur Rahman and Guido Van Huylenbroeck provide an assessment of the CF system in improving market access for smallholder poultry farmers in Bangladesh. While the industry is dominated by small-scale, informal producers, it is seen as an important sector for fostering agricultural growth and reducing malnutrition for the population of Bangladesh. CF has helped to contribute to the transformation of small-scale backyard producers into commercial poultry farmers, through the adoption of improved production practices and the guarantee of a secured market. The case highlights the importance of a holistic approach to defining contract conditions that address current market failures for inputs (i.e. chicks, feed and veterinary supplies), as well as production risk for farmers (i.e. high mortality rates of chicks and disease outbreaks) and the lack of an efficient marketing system for collection, storage, processing and marketing of poultry products. External factors such as a supportive policy environment designed to protect small farmers, and growing domestic demand for poultry products have also helped to encourage domestic companies to adopt inclusive contracting practices. Drawing on previous empirical studies, the authors inform on income and efficiency gains for smallholder farmers operating under contract, when compared with independent farms, and make a strong case for a well-organized CF system as a way through which smallholders can run farms commercially.

In Chapter 4, Jiqin Han, Jacques H. Trienekens and Jia Xu highlight the strong connection between food safety and quality issues as the driving force behind increasing vertical coordination between pig meat producers and processors in the pork industry in China. The authors describe the existing supply chain for pork production as one that is highly fragmented, because of the predominance of small-scale producers and meat processors that service wholesale, retail and (limited) international markets, while trying to satisfy increasingly stringent domestic consumer requirements for meat quality and safety. The inherent traceability challenges associated with this system have led to a shift away from spot market transactions and an increase in contracting. Previous empirical studies undertaken in China have confirmed that contracts contribute positively to improving quality and safety in the pork sector (Han, Trienekens and Omta, 2011). To illustrate the specifics of contract management, four case studies were carried out with pork processors located in eastern and middle China in 2011. Pork processors are considered the leaders of the supply chain in China, in part because of their cooperative relationship with universities and research institutes, which encourages the adoption of new technology in pig breeding, production and quality management. Producers entering into contracts with processors were found to benefit from secure marketing channels; reduction in price risks and information asymmetries; increased access to improved production inputs (including high-quality feed, medicines, technologies and veterinary services); and improved product quality through regular monitoring of production hygiene and disease control.

The authors conclude by arguing that CF has been an important step to help small producers gain access to resources and improve competitiveness. Yet they suggest that further effort is still required to enhance the effectiveness of contracting. Recommendations include improving communication between producers and processors, strengthening producer cooperatives and identifying long-term macroeconomic policies to promote the sustainable development of pig production in China.

Chapters 5 and 6 provide examples of contracting in the horticultural sector in South Africa (citrus) and the United Republic of Tanzania (vegetables). Sandrine Fréguin-Gresh and Ward Anseeuw make a contribution to the ongoing debate about the extent to which restructured agrifood markets can provide viable market opportunities for small-scale farmers in South Africa. Based on the analysis of case studies from the citrus sector, they argue that CF is not a panacea for smallholders. While farmers under contract were found to benefit from increased incomes, better access to inputs and services and new opportunities to participate in markets for certified products, the results also show that CF remains limited in terms of inclusion and mostly involves better-off farmers who have already benefited from significant public support. They also highlight the potential issue of loss of control and decision rights over production and resources for farmers participating in contracts. In order to overcome some of these challenges and improve the potential for inclusive CF arrangements, Fréguin-Gresh and Anseeuw promote the adoption of flexible contracts with long-term "win-win" linkages; and the establishment of an agribusiness-farmer-government circle that encourages open dialogue with civil society and interprofessional organizations. Additional macroeconomic measures such as broader transformation of farm and market structures are also considered essential in order to integrate smallholders better into restructured agrifood markets.

In Chapter 6, Andreas Rüsch, Gerhard W. Ohlde and Marlo Rankin further the argument presented by Fréguin-Gresh and Anseeuw by emphasizing the risks associated with CF for smallholders. The chapter presents a case study on contracting for vegetable production in the United Republic of Tanzania as a means to overcome land and labour limitations. Following the nucleus estate model, a vegetable packing and export company began contracting surrounding smallholder farmers to produce vegetables for export to European markets. The company selected varieties, and provided inputs and technical assistance to help producers achieve GlobalG.A.P. standards and consequently improve both productivity and quality. While the arrangement did help smallholders to access more lucrative markets and increase incomes, it was ultimately unsustainable because of the weak financial and operational management skills of the exporter. These limitations resulted in the inability of the contractor to meet downstream (i.e. importer) customer requirements, which eventually led to the collapse of the operation. This chapter clearly highlights the risks and challenges for smallholders when engaging in CF arrangements with companies with limited previous CF experience, and that service sophisticated export markets with harsh and/or inflexible sales contract conditions. The authors conclude that a broader set of skills are required for contracting companies that extend beyond the technical production relationship between the company and producers. They argue that professional financial and management skills and procedures must be in place to help safeguard farmers from associated downstream risk. They recommend the enforcement of due diligence procedures

and third-party certification of management systems for companies engaging in large-scale contracting of smallholder farmers.

Chapters 7 to 9 give examples of contracting for large-scale commodities where international market factors have led to an increase in the use of production contracts to help international companies secure raw material supply.

While, in Chapter 6, Rüsch, Ohlde and Rankin highlight the risks associated with CF for international market access in the United Republic of Tanzania, in Chapter 7, Ingrid Fromm presents the clear benefits for smallholders in Honduras engaged in contracting for the organic cocoa export market. Responding to the demands of Swiss consumers for increased sustainability and transparency in the sourcing of raw materials, since 2008 an international buyer in the Swiss market has signed a direct supply contract with the Honduran Association of Cocoa Producers (APROCACAHO). The supply contract is designed to source organic cocoa from more than 500 producers under a pilot scheme supported by local and international Non-governmental Organizations (NGOs). Despite the ideal climatic conditions for the production of cocoa in northern Honduras, over the past 15 years the sector has experienced the devastating effects of natural disasters and high levels of price fluctuation. However, recent redevelopment efforts within the sector have paid particular attention to training producers in organic production, and the unique taste properties of cocoa varieties produced in Honduras are beginning to be recognized as desirable for servicing high-value retail markets. Farmers under contract with the company (via the growers' association) receive technical support to improve production quality, build up drying and fermentation infrastructure and acquire third-party certification (organic, fairtrade). In addition, access to credit and *ex ante* export guarantees are provided that help to reduce risk and increase commitment to organic production. To date, the pilot scheme has delivered concrete benefits to smallholders, including increased income and a secured market for organic products with strong potential for expansion of the scheme.

The author identifies several internal and external success factors that have helped to make the contract system successful. These include the long-term vision of the company to establish a transparent supply chain for high-grade organic cocoa that treats farmers as genuine partners and meets the demands of consumers for sustainability; the key role of the producers' association in consolidating volumes and monitoring product quality; and the creation of an enabling environment for sector development supported by a number of local and international public and private sector actors.

In Chapter 8, Marcos Gallacher analyses the contractual arrangements for barley production in the Argentine *pradera pampeana* (pampas) region. The malt barley processing chain in Argentina is highly concentrated, which would suggest the potential for uneven power distribution between contractors and producers. However, Gallacher provides clear evidence that contracting does not occur in a vacuum, but rather is the result of a number of contextual market factors. These include the specificity of barley varieties demanded by malt producers because of consumer preferences for differentiated beer products; the availability of export market options and a strong domestic forage market for barley; and a number of crop substitution options in the region including wheat, soybean and sunflower. All these factors mean that contractors must offer favourable terms to barley producers to cover opportunity costs and

provide incentives for contract compliance. It is posited that the long-term presence of independent grain testing and arbitration boards also reduces the probability of non-compliance and costs of litigation. In addition to this assessment, the author explores in further detail the impact of contracting on producer decisions such as input purchasing agreements and collective marketing of outputs, extent of vertical coordination with other chain actors, adoption of risk management tools (insurance) and the use of technical expertise. Based on the findings from the empirical analysis, he concludes that formal contracting has a positive impact on all four dimensions.

CF for staple food products such as rice is often seen as especially challenging, in view of the higher likelihood of buyer competition and opportunism leading to side-selling. The case discussed by Verna Goel in Chapter 9 suggests that management flexibility and adaptability to the enabling environment can be conducive to successful contracting for these types of products. The author discusses basmati rice contracting between PepsiCo and smallholder farmers in the Indian state of Punjab, where new markets for this crop have been developed in response to domestic and global demand, coupled with governmental stimuli and technological innovation. With a long-standing presence in CF operations in India, PepsiCo saw an opportunity to diversify into basmati rice in the late 1990s, gradually augmenting its supplier base and producing areas, which led to a share of some 24 percent of the total area under contracting in the state in the 2010/11 crop year. This was accomplished by a decision to focus on areas not yet well developed for basmati rice production and where farmers could not access these markets independently.

In its contracting operations, the firm provides farmers with requisite seed varieties, technical expertise and training, and then commits to buy back the crop at pre-announced basic prices. Rather uniquely, farmers are allowed to sell their products outside the contractual bond, a strategy that has been interpreted as a way to cope with governmental requirements regarding agricultural marketing in the country. Indeed, under the Agricultural Produce Marketing Committee (APMC) act, farmers are required to market their products through wholesale food grain markets, selling to their preferred commission agents (CAs), who are the licensees of market committees. Processors, traders, exporters and other large buyers in turn either send their purchase agents/managers to these markets to participate in the open auctions, or else align directly with the CAs, specifying quality parameters and lot sizes. PepsiCo entered into agreements with CAs and with a large rice processor, which acts on its behalf in liaising with farmers and providing services in processing and logistics. Through this system, the company has managed to guarantee its supply needs, while at the same time providing an opportunity for market access to farmers who would otherwise be severely constrained to engage independently in basmati rice production.

Based on her analysis of a sample of contract and independent farmers in the areas around selected wholesale markets in the state, Goel concluded that while the expansion of the basmati rice market benefited both groups, contract farmers had some added benefits. One important advantage is that marketing risks are reduced, because PepsiCo is legally obliged to buy their product under the agreed contract price, in cases when market prices fall below it. Moreover, contrary to the case of independent farmers, contract farmers are paid only a few days after delivery, a fact that effectively translates into added financial gains, *vis-à-vis* the situation of farmers who have their payments delayed. Furthermore, the provision of improved

seeds and technical assistance has been essential for the participation of smallholder farmers in these demanding markets.

In short, the case showed that while CF was not a necessary condition for farmers in the Punjab to benefit from the growing market opportunities for basmati rice, it allowed PepsiCo to operate skilfully under a constrained regulatory environment. By choosing to target areas where independent growing was more challenged, the company was able to benefit from location advantages. Moreover, CF acted as a mechanism of market access for the more disadvantaged producers to benefit from these new markets.

Chapter 10 focuses on a growing area of interest for CF, which is the adoption of chain governance mechanism in bioenergy chains. Aziz Galvão da Silva Jr., Felippe Clemente and Ronaldo Perez summarize the case of Brazil, pointing out that CF is a key element in the biodiesel programme of the country. The programme explicitly promotes the inclusion of smallholders in biodiesel supply chains by offering incentives to firms that, among other commitments, agree to purchase a certain percentage of their raw material needs from this class of producers. The relationship between farmers and the biodiesel industry is regulated by a certification scheme called the Social Fuel Seal. Besides providing access to tax incentives, the seal allows companies to sell biodiesel through exclusive auctions organized by the Brazilian National Program for the Production and Use of Biodiesel (PNPB), which represents 80 percent of the trade for this product in the country. Some 109 000 small-scale farmers have signed contracts with companies under this scheme, with clauses that establish, among others, price determination methods, product quality specifications, technical assistance provision commitments by the contracting firms, and issues related to contract initiation and termination. Most of the participating farmers are soybean growers, as experiences with other bioenergy stocks have not been as successful to date. Impact studies cited by the authors suggest that the programme is benefiting smallholders through increased incomes and marketing risk reduction. Firms also benefit by the above-mentioned preferential market access and tax incentives. The chapter suggests that the strong public sector intervention, although essential for the success of this experience and although typical of bioenergy programmes, creates bureaucratic compliance costs for the participating companies and introduces a high level of vulnerability to policy changes and revisions of the regulatory framework. Yet the case illustrates the importance of political will in the promotion of market access for smallholders. By linking this goal with the policy decision of promoting alternative sources of energy, Brazil has effectively created attractive opportunities for inclusive supply chain development.

The final chapter, Chapter 11, deals with another agriculture product that is not well covered in the CF literature. Axelle Boulay's contribution discusses the case of three Thai pulp and paper companies that contract with smallholders to grow eucalyptus trees. With a short production cycle, eucalyptus is a fast growing tree that is especially suitable as raw material for the pulp and paper industry. To meet the industry needs, large extensions of land are required for eucalyptus plantations, a fact that represents a hindrance to the full vertical integration of these companies in Thailand, where smallholders hold almost all private land. As open markets in the country are not reliable for the purposes of efficient supply chain planning, contracting has thus become the procurement model of choice: the three companies studied

have a total of 233 000 ha of land under contracts, or roughly half the total national area planted with eucalyptus. Some 60 000 farmers are engaged in the CF operations of the three companies, which provide planting materials, fertilizers and technical advice, and guarantee the purchase of wood at the end of the production rotations. Farmers in turn commit to sell exclusively to the contracting company and sanctions are foreseen in cases of non-compliance. Prices are established as a function of the prevailing market prices at the time of delivery, also taking into account product characteristics such as the diameter of the trees. To mitigate risks of unfavourable market fluctuations for farmers, a minimum guaranteed price is set up on a yearly basis, which is paid to farmers if the prevailing market price falls below it.

To assess the impacts of the contracting arrangements, Boulay contrasted samples of contracting and non-contracting farmers. Her analysis indicated that contracting was particularly effective in promoting technology uptake through the dissemination of improved planting materials and the provision of technical advice. This converted into higher yields and consequently increased incomes. Non-contracting farmers encountered technical problems with the establishment of their plantations and with the management of mature tree stands, including problems with fires that could in principle be avoided by better forest management practices. The analysis also called attention to the importance of location and farm size on decisions to contract. Although companies did not discriminate against smaller-sized farmers, non-contracting farmers generally owned smaller areas than their contracting counterparts. This was explained by the existence of economies of scale in eucalyptus growing and was associated with the location of the farm with respect to the paper and pulp mills. Since farmers needed to travel to the mills in order to acquire planting materials, the more distant farms were further discouraged to contract. Moreover, lack of access to agricultural credit further hindered contractual participation of smaller landholders, since the companies did not provide prefunding for the acquisition of planting materials and/or to cover plantation establishment costs other than fertilizer supplies. The study also calls attention to the importance of competition at the first handler level as a factor that favours smallholders in their relationship with contracting companies. The presence of intermediaries and the dispute for land areas by the pulp and paper companies have been acting to cushion farmers from the threat of opportunistic behaviour by the companies that could be manifested in cases where the market for such a specialized product would show a higher degree of imperfection.

1.3 KEY MESSAGES

The cases and conceptual work summarized above enable a number of key messages to be drawn regarding the role of CF as a tool to promote inclusive market access. While some of the findings discussed below have already been the subject of consideration in the CF literature, new insights are offered as contributions to the debate. The main takeaway messages of the book can be summarized as follows.

- **The expansion of CF as a chain governance mechanism will not necessarily lead to the exclusion of smallholders from agrifood supply chains**
  Evidence on the preference for procurement from larger and more wealthy farmers notwithstanding, variables other than farm size also play a role in a firm's decision to select supply chain participants. In some circumstances, these

additional factors can even be more determinant than farm size, as suggested in some of the cases presented in this book. In the case from Argentina, one of the conclusions is that even when controlling for farm size, managerial ability (measured in terms of years of formal education) was an important factor for inclusion in the CF scheme, as decision-making skills are critical for negotiating and carrying out contracts. For eucalyptus in Thailand, firms showed a preference for farmers who were located closer to the sites where planting material was made available. In the case of basmati rice in India, farmer location was also a major consideration, as the buying company catchment areas were selected where farmers could not access rice markets independently, as such indirectly favouring the inclusion of smaller-scale producers in the supply chains. The issue of location will be further discussed later in this chapter.

The type of commodity contracted can also play a role in the decision of the types of farmers that should preferably be contracted. In the case of crops or livestock that depend on close, intensive care during the growing season or rearing cycle, farms relying on family labour that can be directly involved in farming operations are often more efficient performers than larger farms that depend on hired labour. Poultry growing in developing countries, for instance, can be especially suitable for small-scale operators for this very reason, as illustrated in the case from Bangladesh. In such specific circumstances, the expansion of the poultry sector can engender growing opportunities for the participation of smallholders in the supply chains. Finally, as suggested in the case of the United Republic of Tanzania, the overriding farmer selection criteria that led to the engagement of smallholders were restrictions in access to land by firms, as well as insufficient labour for hire to support the estate if the firm were to integrate vertically.

The case of Bangladesh also highlights the role that governments may play to stimulate inclusion, as exemplified by the policy to restrict large-scale poultry farms through the use of licensing schemes. As opposed to such disincentives to larger farm selection, countries may also promote incentives for smallholder participation in CF schemes, as demonstrated in the case of biofuels in Brazil. The cases, in brief, offer further evidence that CF is not intrinsically exclusive of smallholders. The issue is certainly a multifaceted one, as remarked in Da Silva and Shepherd (2013).

- **The territorial dimension should not be overlooked when considering CF as a tool for inclusive market access**
  In addition to the aspects highlighted above regarding the role of farmer location in decisions to include smallholders in CF operations, the relationship between local social and cultural heritage and the type and scope of CF arrangements was pointed out as an issue of relevance in the conceptual discussion of Chapter 2. Such dimensions are clearly dependent upon geography impacting on issues such as land access rights, gender and/or ethnic relationships in farming and trading, market relations and trust building in contractual relations, to name but a few. This in an observation that adds to the call for more explicit consideration of geography in CF discussions, particularly those related to smallholder inclusiveness in modernizing supply chains. Indeed, in her research

with five commodities in southern India, Narayanan (2013) observed that before selecting their portfolio of farmer suppliers, firms select the communities they will be sourcing from within a given geographic domain. The underlying motivations for the location choice encompass, *inter alia*, agroclimatic specificities, the existence of irrigation infrastructure and the relative distance to processing facilities. While some of these might be positively correlated with the size of landholdings, this will not always be the case. Location variables thus may become the overriding factor in farmer selection. Overlooking this issue may lead to misguided firm contracting strategies and/or public policies.

- **Despite differences in contractual features as a function of product specificities and particularities of the enabling environment, it appears that a tendency towards a convergence in clauses and conditions does exist**
  The cases presented in this book provide further evidence to support the well-documented commodity-specific nature of CF agreements as evidenced by the similarities in design of contractual clauses within product groupings such as livestock and high-value horticultural products. However, even across the commodity and enabling environment contexts, similarities in clauses and conditions were found to exist, and many of these refer to contract design issues underscored in the *Guiding principles for responsible contracting farming* (FAO, 2012a).

  For example, in relation to pricing mechanisms, most contracts provided detail in a transparent manner on how prices were to be determined and payment procedures executed. In five of the cases presented, in order to minimize the potential for side-selling, prices were determined daily, based on the prevailing market prices at the time of harvest/delivery. In two cases where farmers were contracted to supply export markets (organic cocoa in Honduras and certified vegetables in the United Republic of Tanzania), contract prices were guaranteed to be above the prevailing domestic market prices, to take into account the investment made by smallholders in upgrading production systems and the risks associated with growing non-local varieties. Prices were also set in relation to external price references. In the cocoa case from Honduras, the New York Board of Trade and the London Stock Exchange are used as a base price reference for cocoa, to which a premium for organic certification and fairtrade was added. In the case from Argentina, barley prices were set in accordance with relevant crop substitutes – i.e. barley prices are determined based on the weighted average of the export and spot market price for wheat. Another common approach to pricing was the combination of a fixed minimum base price upon signing, and potential for negotiation/revision in accordance with market-based pricing upon delivery. The basmati rice example from India and pork production in China both used this approach. Even those contracts implementing a fixed price approach upon contract signing (e.g. contracting for forestry products in Thailand and citrus in South Africa) mostly provided sufficient detail within the contract on how the price was calculated.

  Similarly, the inclusion of explicit clauses related to quality requirements was common across all the cases with quality parameters commonly defined in terms of both cultivation and post-harvest phases. For those commodities

where food safety risks were higher or end markets more demanding (e.g. livestock and certified organic cocoa), these clauses were understandably more detailed. Five of the cases also included clauses related to quality-based pricing incentives with details provided on the conditions for achieving these incentives, such as the adoption of manual harvesting practices for basmati rice in India; higher protein content for barley grain in Argentina; and increased tree diameter for eucalyptus in Thailand. Each contract also provided detail on delivery responsibilities and, in the majority of cases, smallholders were responsible for transportation and associated costs for delivery to either the contractor or the bulking intermediary (e.g. cooperative/producers' association). For the livestock cases, suppliers were also responsible for ensuring animal welfare during the transit process. Only in the case from India was a small subsidy provided by the contracting company to smallholders to help reduce the delivery costs associated with remote access to market. Those farmers transporting from distances greater than 25 km from the designated wholesale markets were eligible for scaled support, with subsidy rates increasing in accordance with distance to market.

Another element common across the majority of contracts was the inclusion of clauses specifying penalties for non-compliance. These varied from detailed clauses that imposed specific fines for side-selling or resale of input materials as highlighted in the case from Thailand, to less transparent clauses associated with downgrading or rejecting produce that did not meet with quality grade standards, as seen in the cases for horticultural products in South Africa and the United Republic of Tanzania. In some contracts, dispute resolution mechanisms were also identified and the use of third-party bodies promoted to reduce the likelihood of litigation. In Brazil, the use of a third-party intermediary (i.e. an official representative body such as a trade union) to mediate the negotiation phase between farmers and the company prior to contract signing is likely to reduce the potential for non-compliance from the outset, as all parties are well informed of their respective obligations. Along the same lines, a key conclusion put forward by the author of the barley case in Argentina is that the mere existence of a private arbitration, mediation and grain quality inspection institution (Cámara Arbitral) is likely to deter opportunistic behaviour, yet can also be called upon effectively to resolve disputes if they arise. While other contracts, such as the poultry case from Bangladesh, did not specify clauses associated with penalties for non-compliance, the locally integrated nature of the contractor in the community meant that it could rely on informal social norms such as reputational risk to reduce the likelihood of non-compliance and need for penalties or formal dispute resolution mechanisms.

- **Promotion of technology uptake and pre-financing of inputs may be the essential requirement for inclusive market access**
  In addition to the above-mentioned contract features, the two most common contract provisions demonstrating greatest potential for inclusion of smallholders were the traditional clauses associated with the provision of technical assistance and financial support for inputs. In Chapter 2, Jia and Bijman argue that the recent surge in CF has more to do with the need for buyers

to strengthen vertical coordination throughout the agrifood value chain, yet they also acknowledge that the traditional reasons for CF (e.g. market failures for farm credit and inputs) continue to be important. Findings from the cases support this argument and show that for smallholders, participation in CF schemes is subject to the provision of technical assistance and pre-financing to access good-quality inputs that are necessary to stimulate technology uptake and drive the transformation process from small-scale, informal production to more commercially oriented farming suitable for accessing modern market channels.

All contracts presented in this book provide technical assistance to smallholders. Yet the extent of this assistance varied depending on the complexity and intensity of commodity production and the level of previous experience of contracted farmers in producing the commodity. For example, in the case from India, most contracted farmers had little or no previous experience in basmati production and thus required more intensive assistance and regular monitoring. Similarly, in the United Republic of Tanzania, contracted farmers had never before grown the varieties of vegetables suitable for export to the European Union market; they were also required to achieve technically complex GlobalG.A.P. compliance. Regardless of the commodity, most technical assistance was concentrated during the early stages of cultivation, in order to ensure proper use of inputs in the establishment of crops and disease prevention in livestock. Regular monitoring (sometimes daily or weekly) and record-keeping on behalf of the farmers were also features common across contracts.

Seven of the cases provided some form of pre-financing to assist farmers to access inputs such as seeds, fertilizers, pesticides, vaccines and animal feed. The purchasing and delivery of these inputs were generally the responsibility of the company, because of their vested interest in cost savings and control over technology and quality. In the cases from India and Thailand, only contracted farmers were able to purchase superior quality, company-protected seed varieties and seedlings, thus an added incentive for contract compliance. Common financing mechanisms included interest-free and low interest loans (Bangladesh, Brazil) or partial loans (Argentina), with repayments either deducted in instalments from supply payments made during the season, or one repayment to be made at the end of the season. In the case of Honduras, *ex ante* export guarantees were also provided, which farmers could then use to help access formal credit. Another feature worthy of note is the coupling of compulsory agricultural insurance with credit provision. In the case of poultry in Bangladesh, where a comprehensive package of inputs was provided on credit, and similarly for barley contracting in Argentina, credit provision is coupled with compulsory purchase of agricultural insurance to protect both the farmer and the company against major losses in upfront investment associated with disease outbreaks or hail and frost damage (*force majeure)*. In Bangladesh, the insurance is partly subsidized by the company in the form of a contributory security fund, whereas in Argentina the insurance has to be purchased independently by farmers, with the policy endorsed by the barley purchaser prior to the release of partial financing for inputs.

- **Newer roles for third parties in contract farming operations may exist that can contribute to their inclusiveness and long-term sustainability**
  The engagement of Non-governmental Organizations (NGOs), development organizations and other third-party players is often a feature of CF schemes in developing countries. Traditionally, they assume active facilitation roles in areas such as coordinating farmers and matchmaking between buyers and producers when a CF operation is in the planning stages; financing intermediation; and resolution of conflicts. These traditional roles are clearly relevant for both the initiation and the longer-term sustainability of CF operations. Several examples of these roles are highlighted in the cases in this book, such as that played by the development cooperation agency in Honduras or that of a third-party intermediary in the case from Brazil. In addition to these more traditional roles, the cases include relatively newer areas of activity for third parties that are becoming more present in contractual relationships between farmers and firms. One of these areas is third-party quality certification, as exemplified by the independent grain testing system reported in the case of Argentina mentioned above. As quality-dependent price determination is one of the known sources of conflicts in CF operations, the engagement of a neutral party can be helpful in promoting transparency in payment systems and in minimizing disputes.

  Quality certification to meet stringent international standards is also an area where third-party players are increasingly providing a contribution to the success of CF operations that are inclusive of smallholders, as seen in the experience with organic cocoa production in Honduras and certified export vegetable production in the United Republic of Tanzania. Certification with support from third parties can not only help reduce the upfront investments that are often a barrier for smallholder compliance with stringent international standards, but can also be a conduit for improved technology uptake, benefiting farmers and buyers alike. Additional roles for third parties were seen in the case of India, where commission agents provide value-adding services to farmers (e.g. paddy cleaning and grading) and act as intermediaries in their commercial relationships with the buying firm.

  Finally, a noteworthy suggestion for a new third-party role within the CF system was suggested in the case of the United Republic of Tanzania. Rüsch, Ohlde and Rankin propose the participation of an independent body to certify the management systems of the contracting company as a mechanism to reduce the risk to smallholders engaging in CF operations with export firms. Despite success on the production side, weaknesses in the financial and operational management systems of the exporter ultimately led to the failure of the CF operation. Although firms clearly have the authority to define their internal managerial controls and associated structures as they see fit, there could be cases of multipartite CF operations where independent audits or similar third-party management certification could be justifiable.

- **Even though market competition at the first-handler buying level is usually seen to be associated with opportunities for side-selling and, as such, a threat to the success of CF, it may also be a factor that contributes to strengthening the sustainability of CF operations**
  Two of the cases in this book, Thailand and Argentina, clearly highlight the potential for companies to respond to pressures from a competitive buying environment in ways that promote contract compliance. In the case of Thailand, Boulay suggests that competition among the wood buyers (companies and their intermediaries), actually contributed to firms offering better conditions to their contracted farmers, thus reducing their enticement to side-sell. Additional references are also made to other cases in Thailand, across a range of commodities, where competition led firms to offer better prices and expand the portfolio of services provided to farmers, thus increasing their loyalty to the company. At the same time, in the forestry case presented, explicit clauses detailing financial penalties for side-selling and/or the misuse of company-provided inputs were also incorporated into contracts. This combination of favourable incentives and explicit penalties for non-compliance appears to have worked well to enable the company to secure raw material in a competitive context.

  Similarly, in Argentina, contextual market factors strongly influence the competitive behaviour of firms in transactions with contracted farmers. Contributing factors include the specificity of barley varieties demanded by malt producers because of consumer preferences for differentiated beer products; the availability of export market options; and a strong domestic forage market for barley. In addition, there are a number of crop substitution options in the region, including wheat, soybeans and sunflower. Together, these factors mean that contractors are compelled to offer favourable terms to barley producers in order to cover opportunity costs and provide incentives for contract compliance, thus promoting loyalty and reducing the likelihood of extra-contractual sales.

- **Although contractual breaches through side-selling seem to be an almost inevitable feature of CF operations, they should not necessarily impede the successful implementation and sustainability of CF operations**
  Even though cases abound in the CF literature on schemes that failed through the problem of side-selling, this difficulty was not evidenced as an issue of major concern in the experiences reported in this book. The benefits of the contractual bond for smallholder farmers and the specific commodity characteristics that limit opportunities for side-selling may plausibly be a reason. Yet, at least one of the cases – that of basmati rice in India – suggests that companies can learn to live with the risk of this problem, instead of attempting to prevent it fully. Indeed, it is likely that some firms plan for this risk and are prepared to write off the costs of a minimally acceptable level of contractual breaches, as these costs may well be lower than the costs of full prevention and/or litigation. In short, companies can work under the hypothesis that some level of breach will indeed happen and then plan accordingly from their

operational and financial standpoints. However, the capacity to adopt this approach will likely depend on the size of the firm and the level of risk, as dictated by the production value contributed by the firm.

- **While a conducive enabling environment is important for the successful implementation and sustainability of inclusive CF operations, innovative contractual design and operational modalities can be instrumental in overcoming legal and regulatory constraints**
  The improvement of enabling environments for agribusiness development is being increasingly seen as an effective policy lever to promote agro-based investments, economic growth and the associated developmental outcomes, including those involving CF schemes (FAO, 2013b; Christy *et al*., 2009; World Bank, 2013). The cases from Bangladesh, Honduras, Brazil, China and Thailand all show that a conducive enabling environment was indeed key to spurring and upholding CF operations. Not only can the policies, incentives and regulatory frameworks set in place by the public sector promote contracting in general and inclusiveness in particular, but they may also support the transition of resource-constrained smallholder farmers to more technified and formalized farming businesses. Yet, non-ideal investment climates are not necessarily a binding constraint to agribusiness investments, including those made in CF operations, as the case of basmati rice in India illustrates. In that case, operational flexibility and non-conventional contractual clauses could help circumvent problems that appeared when the legal and regulatory framework was shown to be restrictive to CF, i.e. a mandatory requirement existed for farmers to sell their products to commission agents (CAs) through wholesale grain markets. To fulfil its procurement needs, the contracting company engaged with the CAs and with a large rice processor, in this way liaising with farmers indirectly. This allowed a CF operation to exist even in the absence of conditions for direct purchases by the firm. Moreover, the contracts do not have an exclusivity clause, allowing farmers to sell outside the contractual bond. The case suggests that when working creatively under restrictive normative settings, firms can build the flexibility needed for their contracting business to succeed.

- **Although very effective in principle, government incentives for companies to integrate smallholder farms into their supply chains through contracts may introduce vulnerability risks for farmers and companies alike**
  It has already been mentioned that government policies and regulatory frameworks can be effective levers to promote smallholder inclusion in supply chains coordinated by contracts. However, even though public sector incentives can both improve the financial benefits and offset the eventual added costs associated with the inclusiveness goal, it is also a fact that the sustainability of a contractual operation may be compromised in the future, if the incentive policy that induced it in the first place is removed. In the case of biofuels in Brazil, the authors call attention to a past episode of policy change (related to the bioethanol programme) that negatively affected the sector and its stakeholders. Although the risks of policy change are not eas-

ily ascertained, farmers and their buyers must take into consideration these issues as they evaluate their business plans to engage in a contracting relationship. Needless to say, the return to risk ratio of the CF engagement has to allow the business to be sustainable, even in the case of high risk exposure to a given policy incentive.

- **Caution is needed when considering the results of impact evaluations of CF schemes**
  Some of the chapters of this book have followed the classical approach in evaluating the impact of CF, which typically entails an assessment of the financial performance of farmers who participate in contracting, and comparing this with the performance of those who do not participate. Normally, data for these studies are obtained from cross-sectional sample surveys, which often attempt to determine farmers' characteristics that can be associated with the likelihood of their participating in CF schemes. Even though the results of these evaluations may provide useful insights as to the outcomes of a CF operation and to the drivers of farmer participation in such schemes at a particular time, findings should be treated with caution.

  Key variables to determine farm incomes, such as product prices, productivity indexes and input prices are not necessarily stable over time. On the contrary, they are likely to vary from year to year and for this reason an impact analysis may produce very different results, depending on when it is performed. Not only may impact analysis based on cross-sectional surveys be affected by the dynamics of markets and of farm productivity, but also the entry-exit dynamics of farmers in such schemes, as observed by Narayanan (2013), may have an effect. By definition, a successful CF scheme will not be short-lived. It will last and, as such, the evaluation of its impacts on participants would ideally consider their longer-term dynamics and how they affect selected performance variables. Longitudinal sample surveys, stochastic cash-flow analysis of typified farms and the evaluation of historical records on prices, costs, productivity and farmers' socio-economic characteristics, which are typically kept by contracting firms, would be some of the alternative approaches that could be considered in that respect.

- **Further research is required in order to understand better the cost to companies of smallholder inclusion and how CF approaches can be better integrated into the emerging discussions on inclusive business models**
  As discussed earlier, there are a number of variables that influence a firm's decision on the types of farmers to be preferably contracted. Two of the factors identified as key for the participation of smallholders in CF operations were the provision of technical assistance and pre-financing for inputs by the contracting company. However, the actual costs for the firm (investment and transaction costs) associated with pursuing such an inclusive strategy are rarely discussed. Understandably, because of the competitive nature of business, such figures are not commonly disclosed. Yet, as the concept of "inclusive business models" grows in popularity as a strategy to promote broad-based agricultural growth in a development context (GIZ, 2013a; 2013b; FAO, 2012b; OXFAM,

2010), the demand for information on "real life" innovative buyer-driven procurement mechanisms that engage with smallholders is increasing. Further research is thus required about the costs of inclusiveness for firms engaging in contracting farming with smallholders, including information about the size of the firms involved, and on whether there are threshold levels for participation. This information would undoubtedly help inform the design of more targeted development interventions that plan to promote CF schemes and, at the same time, aim to strengthen the diversity of private sector engagement with smallholders.

In closing, it can be said that the chapters of this book provide further evidence to the fact that although CF is certainly not a one-size-fits-all solution to the complex issue of promoting smallholder inclusiveness in modernizing supply chains, it can be a very effective mechanism in this regard. While the selected cases are not numerous, they represent a good cross-section of experiences covering different countries, commodities and socio-economic contexts. Furthermore, the extensive literature that sustains their argumentation and analysis expands to a great extent the thematic and contextual coverage of the book.

As an area of growing interest for development practitioners, policy planners, agribusiness firms, academics and other concerned professionals, CF needs to be recognized as intrinsically nuanced. More often than not, lessons learned from a specific experience are not necessarily generalizable over different contexts and circumstances. Experience has shown that treating these lessons as workable hypotheses that need to be put to the test or, at best, as inspiration for contextual adaptation and design, is a cautionary approach with proven value. This is valid for the cases in this book and for the lessons to be derived from them. It is hoped that the issues raised by the authors, and the key messages outlined by the editors above, will inspire further research to help enrich our knowledge of CF issues as a tool for inclusive market access.

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Chapter 2

Contract farming: Synthetic themes for linking farmers to demanding markets

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2.1 INTRODUCTION

Producing and selling on a contractual basis are common arrangements in the agricultural sector all around the world. Contract farming (CF) has long existed, particularly for perishable agricultural products supplied for the processing industry, such as milk for the dairy industry or fruit and vegetables for preserved products. Towards the end of the twentieth century, CF became more important in the agricultural and food industries in both developed and developing countries. Spurred by changes in (international) competition, consumer demand, technology and governmental policies, agricultural systems are increasingly organized into tightly aligned chains and networks, where coordination among production, processing and distribution activities is closely managed (Zylbersztajn and Farina, 1999). Contracting between producers on the one hand and processing or marketing agribusinesses on the other are viable methods to strengthen vertical coordination in the agrifood chain (Swinnen, 2007).

The trend towards more CF and the reasons behind it have been extensively described for the agrifood industry in developed countries (Martinez and Reed, 1996; Royer and Rogers, 1998). Developing countries are impacted by the same trends in the agrifood system and also experience an increase in CF. Moreover, there are several developments that could lead to an even more rapid expansion of CF. One of these is the rise of supermarkets in food retailing. Over the last two decades, supermarkets have increased rapidly in the urban areas of developing countries, particularly in Asia and Latin America (Reardon and Berdegué, 2002). More recently, a similar trend has been observed in Africa (Reardon and Gulati, 2008). Supermarkets have procurement practices that favour centralized purchasing, specialized and dedicated wholesalers, preferred supplier systems and private quality standards (Shepherd, 2005). These characteristics require more vertical coordination among producers, wholesalers and retailers, thus favouring the introduction of CF. A further development relevant for CF in developing countries is the reduced state role in agricultural production and marketing. As part of market liberalization policies, governments have often cut their budgets for and direct involvement in providing

inputs and technical assistance and in marketing farm products. As markets for the private provisions of inputs and services continue to fail, CF could solve the problems of farmer access to inputs (Key and Runsten, 1999).

A third development refers to the ambition of donors, development Non-governmental Organizations (NGOs) and governments of developing countries to strengthen smallholder access to markets. These agencies consider CF to be one of the main instruments to link small-scale farmers to domestic and even foreign markets and thereby to reduce poverty (FAO, 2004; IFAD, 2003; World Bank, 2007). Since CF arrangements often include the provision of inputs and technical assistance, participating smallholders can benefit from new market opportunities otherwise not available to them.

The intellectual popularity of CF reflects the evolved thinking of development strategies (Little, 1994). CF was encouraged in the 1960s, because of ideological thinking and a desire to target the rural poor, internationalized agriculture and the dynamics of rural development strategies. The exclusion of smallholders from the Green Revolution in the 1970s made many commentators and practitioners see CF as a viable tool to integrate small farmers into the industrial sectors. In the late 1980s, CF was initiated in Africa by various development agencies (such as the World Bank and the United States Agency for International Development [USAID]) with a view to avoiding government-related market and price controls. Intellectual leaning towards CF in the early 1990s was based on the emphasis of the private sector and market-led growth. Nevertheless, market liberalization and the quick withdrawal of the state left huge gaps in the linkages between small farmers and markets.

In the wake of internationalized agriculture and radical changes in the agrifood market in developing countries, CF is now regarded as one of the components of integrated rural development strategy and of dynamic partnerships whereby small farmers can obtain access to markets, as well as to technological and managerial assistance (FAO, 2001). In this context, CF is re-emerging on the development agenda as an innovative financial intermediation with the rise of integrated supply chains as an adapted response to stringent food safety standards, and as an effective tool for poverty reduction (World Bank, 2007). In the meantime, the role of governmental organizations and NGOs as catalysts in connecting smallholders to markets is re-emphasized (e.g. Narrod *et al*., 2009).

This chapter does not aim to provide a comprehensive overview of CF literature since various in-depth reviews are already available (FAO, 2001; Glover and Kusterer, 1990; Little and Watts, 1994). It attempts, however, to broaden the intellectual debate and enhance the study of multiple trajectories of CF. Furthermore, it aims to encourage scholarly discussions on a set of core practical concerns and concurrent theoretical questions beyond the state of the art in CF studies.

The chapter has the following structure. To arrive at a synthesis, the thesis in Section 2.2 begins with an explanation of the functional roles of CF and the different types of CF arrangements found around the world. The subsequent antithesis (Section 2.3) relates to the often unilateral focus on CF as a transaction cost-reducing tool or business model. Section 2.4 on new institutional economics has been included for those readers interested in the theoretical background to most CF literature. The synthesis is presented in Section 2.5, emphasizing the need for a holistic and congruent framework of analysis. In Section 2.6, the main research and

policy themes that result from current developments in CF arrangements are given. Section 2.7 at the end of the chapter draws some conclusions.

2.2 THESIS: A FUNCTIONAL PERSPECTIVE ON CONTRACT FARMING

Contracts in agriculture have three distinct functions (Hueth *et al*., 1999; Sykuta and Cook, 2001; Wolf, Hueth and Ligon, 2001).

- First, contracts serve as a *coordination device*, allowing individual actors to make decisions (e.g. on resource allocation) that are aligned or need to be aligned with decisions of the partner(s). Coordination is meant to ensure that products of the right quantity and quality are produced and delivered at the right time and place. For instance, contracts commonly specify the volume to be delivered to the contractor in order for the producer to know how much to sow or plant and for the contractor to know how much processing capacity to install. To a limited extent, coordination can be attained by financial incentives. However, more detailed coordination requires information that cannot be transferred through prices alone but also requires contractual provisions on the obligations of each partner and on the distribution of decision rights on those actions that are not stipulated in the contract.
- Second, contracts are used to *provide incentives and establish penalties* in order to motivate performance. Without proper incentives for each contract partner, no transaction can take place. For example, when a contractor demands specific activities from a farmer, such as the provision of particular quality commodities, the contract should clarify what compensation is due to the farmer as a result. The contract may include an agreement on the price, but may also indicate what price determination mechanism will be used to decide upon the correct compensation.
- Third, contracts clarify the *allocation of risk*. For example, farmers can mitigate the risk of income loss because of poor yields by signing an agreement with the contractor that specifies a portion of compensation that is independent of realized yields.

Contract farming is often presented as an institutional arrangement used for organizing vertical coordination between growers and buyers/processors (Bogetoft and Olesen, 2004).[2] Vertical coordination means that the activities of sellers and buyers are closely aligned. As supply (or value) chains are characterized by sequential transactions, vertical coordination implies that the transactions upstream (such as between producer and processor) are aligned with transactions downstream (such as between processor and distributor). These upstream and downstream transactions become increasingly interdependent when, for example, processors have invested in establishing a consumer brand for their products. In order to protect this brand from devaluation by not fulfilling customer expectations, processors try to control any process that could negatively affect the value of the brand.

[2] Vertical coordination in agrifood chains in developed countries was widely studied in the 1990s (Frank and Henderson, 1992; Galizzi and Venturini, 1999; Royer and Rogers, 1998), while the study of vertical coordination in developing countries is a more recent phenomenon (Swinnen and Maertens, 2007).

Not all transactions with agricultural products are suitable for CF arrangements. CF necessarily involves costs for both producers and contractors, which must be outweighed by benefits; moreover, the balance of costs and benefits has to better that of other arrangements for selling/buying the same products. These seller/buyer or farmer/customer costs are commonly called transaction costs and they generally increase when more vertical coordination between seller and buyer is required. A study of the vertical coordination requirements will indicate which particular arrangements should be adopted. The type and intensity of vertical coordination depend on the type of product, and on processor, retailer and consumer demand. Minot (2007) made a useful distinction in the factors that influence the need for vertical coordination: type of product, type of buyer and type of destination market (see Section 2.5).

2.2.1 Typology of contracts

Contract farming is a broad concept that encompasses many different types of arrangements and contract provisions, as well as many different services that may or may not be included in the agreement. All the literature on CF emphasizes the diversity of contractual arrangements between farmers and contractors. This diversity is a result of the technical requirements of production, and associated production and transaction costs (Simmons, Winters and Patrick, 2005). To structure the multiple contracting arrangements, a typology of agricultural contracts may be helpful. Mighell and Jones (1963) established a classic typology of contracts between farmers and their customers by distinguishing between market-specification, production-management and resource-providing contracts. These contracts differ in their main objectives, in the transfer of decision rights (from the farmer to the contractor), and in the transfer of risks.

- A *market-specification* (or marketing) contract is a pre-harvest agreement between producers and contractors on the conditions governing the sale of crops/animals. Besides time and location of sales, these conditions include the quality of the product, which will affect certain farmers' production decisions. The contractors reduce producers' uncertainty of locating a market for their harvest, but farmers still bear most of the risks of production activities.
- The *production-management* contract gives contractors more control than the market-specification contract, since they inspect the production processes and specify input usage. Producers agree to follow precise production methods and input regimes, which implies that farmers have delegated a substantial part of their decision rights over cultivation and harvesting practices to contractors; they are willing to do so because the contractors take on most of the market risks.
- Under the *resource-providing* contract, contractors not only provide a market outlet for the product, but also provide key inputs. Providing inputs is a way of providing credit in kind, the costs of which are recovered upon product delivery. The extent to which decision rights and risks are transferred from farmers to contractors depends on the contract itself.

While this typology has been used by many authors, it has recently been criticized by Hueth, Ligon and Dimitri (2007) for being of little value in understanding contemporary agricultural contracts. Their main criticism is that this distinction does

not hold in practice since most contracts combine elements of marketing (which is in the interests of farmers) and coordinating production and processing/marketing activities (in the interest of contractors).

Minot (1986) discussed how these three different types of contract could solve specific transactional problems (when comparing CF with spot market transactions). For example, a *market-specification* contract could reduce the costs of gathering and exchanging information about demand, quality, timing and price, thus reducing uncertainty and the concomitant market risks. By increasing information exchange, this type of contract reduces coordination costs (as compared with spot market trading). These costs are particularly notable in the case of (i) perishable commodities supplied for processing, export or supermarkets; (ii) complex quality products; and (iii) new (niche) markets. A *production-management* contract specifies the cultivation practices necessary to achieve quality, timing and minimal production costs, thereby economizing even more on coordination costs. Such a contract may also support producers' skills development, which will reduce transaction costs in the future. A *resource-providing* contract could reduce the costs of obtaining credit, inputs and extension services, including the costs of screening and selecting these services. This type of contract is typically adopted for crops where the quality of the output depends on the type and quality of the input, and where provision of input reduces both production costs for farmers and purchasing costs for contractors.

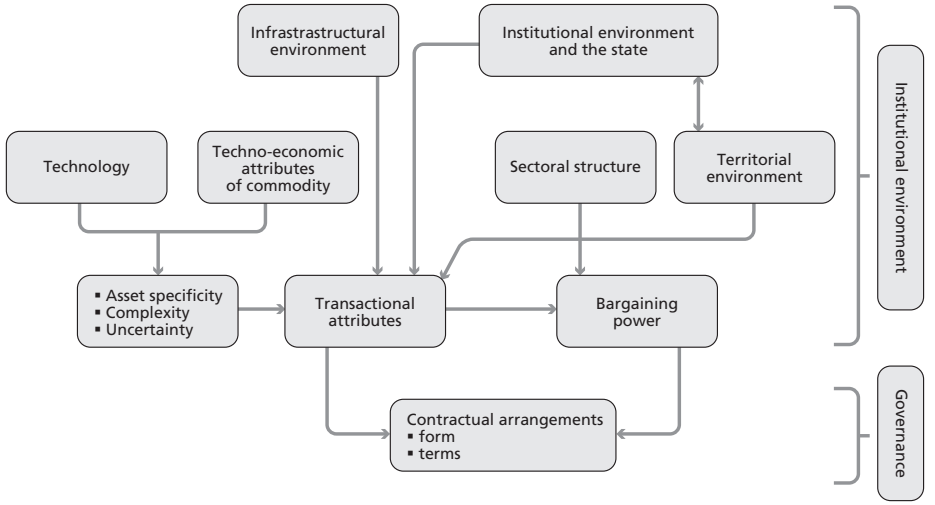
2.3 ANTITHESIS: EFFECTIVENESS OF CONTRACT FARMING ARRANGEMENTS

Although CF can reduce transaction costs, it cannot completely solve the problems of opportunism and under-investment. As long as there is information asymmetry, one party may exploit an exchange at the expense of the other. At the regional and national level, contractors frequently seek market monopolies or concessions from the government in order to protect their investments. At the individual level, small-scale farmers, who face increased dependency and indebtedness with contracts, may be exploited by a monopsonistic trader (i.e. where a market situation exists with only one buyer/trader). On the other hand, farmers may divert their supported inputs for non-contracted use or sell their contracted produce to others. This type of market leakage is a common problem and has led to the failure of many contracting schemes (FAO, 2001). Downstream traders, processors or retailers will not invest in physical and/or human assets if they face the risk of opportunism by farmers. In short, CF vertical coordination does not remove the possibility of opportunism and hold-up, leading to weakened *ex ante* investment incentives.

CF appeals to NGOs and donors because, as a private-sector commercial venture, it is considered to be financially sustainable. Moreover, it assumes a market orientation since the initiative of the contracting schemes resides with the downstream customer. Yet CF records show that market instability and management problems frequently make contracting schemes unsustainable in the long term (Little, 1994).

The antithesis associated with CF reflects the fact that contractual arrangements do not only constitute a business model involving different economic actors seeking an efficient and effective exchange mode. It is the authors' belief that CF should be placed in the wider context of rural development, where public agencies and NGOs could play a major role in promoting and structuring CF schemes. To comprehend

FIGURE 2.1
Determinants of contract farming arrangements



Source: adapted from Poulton *et al*. (1998) and Williamson (1985).

and improve the use of CF as a development strategy better, a comparative approach that recognizes the alternative market contracting structures and dynamics of governance helps to understand the synergistic relationship between theories and empirical findings (Joskow, 2005; Ménard and Klein, 2004). In this respect, the new institutional economics (NIE) approach to industrial organization fails to explain the multiple trajectories of capitalist development of agrifood markets (Hart, 1997). A multidimensional model that includes both formal and informal elements of the institutional environment as well as existing social capital and norms will provide a more comprehensive explanatory framework (see Figure 2.1). Section 2.4 discusses the dominant NIE perspective on CF. (Readers who are not interested in this theoretical background may prefer to proceed to Section 2.5, where the multidimensional character of CF arrangements is discussed).

2.4 A NEW INSTITUTIONAL ECONOMICS APPROACH TO CONTRACT FARMING

Theoretically, CF is often explained using the lens of new institutional economics (NIE) or, more specifically, transaction cost economics (TCE). Central to NIE and TCE is the idea that all transactions between economic actors involve transaction costs. These costs relate to finding a market/customer, negotiating, signing a contract, controlling contract compliance, switching costs in case of premature termination of the contract, and all lost opportunities. Transaction costs appear in different forms, but are mostly caused by uncertainty and/or asymmetric information.

In the presence of high transaction costs, non-standard contracts may be effective in reducing overall costs where there are high risks and asset specificity. In a

smallholder agrarian economy, NIE analysis is "open to the possibility that, under circumstances where standard competitive spot markets for inputs and credit fail due to high transaction costs, interlinked or interlocked transactions may be transaction cost efficient ... [to] allow imperfect markets to develop where the alternative is complete market failure" (Dorward, Kydd and Poulton, 1998).

Transaction costs are overwhelmingly present in rural economies, particularly in developing countries, not only because of missing input markets and substantial information asymmetries in output markets, but also because of the small scale of most farming production units compared with the size of their trading and processing customers. Even with increased mechanization, the dominant farm ownership structure continues to be the family farm, where the land is owned by the family nucleus, most of the labour is provided by family members and all management is the responsibility of the head of the family. This model has been explained as an efficient response to on-farm incentive problems (Binswanger and Rosenzweig, 1986). Where there are incentive problems, given the assumption that individuals dislike effort, the information asymmetry makes supervision and monitoring costly. As a result, a hired labour force is perceived to be less efficient than family labour. Family ownership of land by smallholders is found to be efficient and egalitarian (Binswanger, Deininger and Feder, 1995).

Nonetheless, scattered family ownership exacerbates transaction costs in the rural economy, and imposes challenges in the agrifood market where downstream intermediaries face constraints in the delivery of the correct quantities and qualities. In the context of overwhelming transaction costs and information asymmetries, simple market exchange is found to be inefficient. CF is therefore an institutional response to high transaction costs related to risks and coordination.

CF should not be considered a form of vertical integration, but should rather be called "vertical coordination". Vertical integration implies bringing the transaction within the boundaries of a firm, thus eliminating contractual or market exchanges (Perry, 1989). Under a CF arrangement, the ownership of the farm does not change. The downstream processors or retailers do not appropriate farm assets, but they do specify in more or less detail the use of these assets.

However, similar to vertical integration, CF arises (partially) from TCE, associated with the process of exchange itself, and market failure, which consists of imperfect competition and asymmetric information. From the viewpoint of TCE, for example, farmers' careful use of chemicals and nutrient-enhancing seed varieties is a specific investment that is difficult to recoup through spot market exchanges. By strengthening vertical coordination, CF substitutes *contractual exchange* for a *spot market exchange*. Such contractual arrangements "bridge the gap between vertical integration and anonymous spot markets" (Perry, 1989).

In order to economize on production and transaction costs, transaction parties (bilaterally or unilaterally) choose the most efficient institutional and organizational structure (Williamson, 1985). These so-called governance structures can be classified on a continuum ranging from spot market to hierarchy (or vertical integration). In between these extremes, various hybrid arrangements can be found, combining price (as the dominant governance mechanism in markets) with authority (as the dominant governance mechanism in a hierarchy). Thus, contracts are a typical hybrid governance structure.

Hybrid governance structures are characterized by three elements: pooling, competition and contracting (Ménard, 2004). Pooling of resources refers to aligning the deployment of individually owned assets as well as to joint investments. Pooling results in interdependencies that require bilateral coordination for efficient resource use. Competition refers to the continuation of some form of rivalry between individual partners in the hybrid governance structure. This competition can be both among different farmers participating in the CF scheme and between farmers on the one hand and their customers on the other (so-called vertical competition). As opposed to vertical integration, where the function of markets is replaced by that of managerial discretion, a hybrid arrangement continues to make use of the motivation and coordination impact of prices. While hybrid arrangements are distinctly different from market and hierarchy, there is still a broad range of different organizational structures that fall within this category, such as short- or long-term contracts, bilateral or multilateral contracts, consortia and strategic alliances, and all kinds of joint ventures. It is the combination of (risk of) opportunism and hold-up that eventually determines the specific governance characteristics of the hybrid. For example, in their investigation on China's emerging farmer cooperatives, Jia and Huang (2011) saw that contracts are increasingly used as a means of vertical coordination between China's cooperatives and buyers. Jia *et al.* (2010) found that farmers in China's cooperatives mostly pool their decision-making in purchasing inputs and marketing outputs but continue to make the majority of production decisions individually. Cooperatives become typical hybrid governance structures (Ménard, 2007), combining contracts between members and the cooperative firm, pooling of resources as members jointly own the cooperative firm, and competition among members as they individually decide on the quantities to sell through the cooperative.

2.5 SYNTHESIS: THE MULTIDIMENSIONAL SCOPE OF CONTRACT FARMING ANALYSIS

2.5.1 Commodity dimension

Contract farming varies with the attributes of agricultural commodities. The biophysical characteristics of a commodity affect transaction costs in agrifood markets. Transaction costs are also affected by how much the crop production cycle involves technical sophistication and specialized equipment (i.e. asset specificity); how much the inputs require specific capital and labour complementarities (i.e. complexity); and how difficult it is to measure quality (i.e. uncertainty) (see Figure 2.1). For example, *simple marketing contracts* are often adopted by farmers and traders for fruit and vegetables because of their perishability and price volatility. By comparison, farmers enter into *production contracts* for poultry meat and vegetables supplied for processing where specific standards are required by downstream processors and retailers. This is because farming activities have to be coordinated with processing and marketing activities to prevent losses through a lack of synchronization. Production contracts are also preferred for certain crops such as cotton that require specific inputs (for example, specific agrochemicals combined with proprietary [Bt] seeds).

Jaffee and Morton (1995), in their exploration of high-value crops in sub-Saharan Africa, concluded that the organization and performance of private marketing and processing are commodity specific. The distinctive techno-economic attributes of individual commodities influence the level of uncertainty and asset specificity.

Vertically integrated or contract-based systems have institutional advantages for commodities that require more investments in physical or human assets and with quality needs that are difficult to measure and need to be safeguarded through sequential stages of the supply chain.

Yet the commodity-based approach has limitations in that the social, political and economic contexts of contract production are not properly specified. An overemphasis on commodity attributes cannot capture the significance of these contexts (Jia and Huang, 2011). Success and failure often have more to do with the (non-) sustainability of particular ventures than with technological and commodity-specific characteristics (Little and Watts, 1994). Furthermore, individual commodity-specific observations lead to fragmented evidence. Cross-commodity studies comparing contract provisions are needed (Hueth *et al*., 1999).

2.5.2 Territorial and sectoral dimension

The literature using a NIE perspective on CF has mainly concentrated on the efficiency effects of different governance structures. However, analysis at the transaction level is incomplete in that it neglects the pre-existing market power heavily affecting contractual arrangements (see Figure 2.1). Existing market structures matter for farmers' bargaining positions and affect the sustainability of contractual arrangements. Rather than being separate, an exploration of territorial and sectoral dimensions complements the commodity-specific analysis at the commodity and household level.

The concept of the supply chain is relevant here, since most transactions between farmers and their first customers (traders/processors) can only be understood when the transactions between traders/processors and retailers are included in the analysis. Since retailers are at present the dominant actors in the food market, particularly where value-added products such as meat and vegetables are concerned, the bargaining power of these supply chain actors needs to be taken into account. The literature on global value chains can inform the impact of power asymmetry in supply (or value) chains on the governance of different transactions and thus on the type and content of contracts used (Gereffi, Humphrey and Sturgeon, 2005).

Furthermore, the local social and cultural heritage affects the type and scope of CF arrangements. While the changing bases and forms of globalization impose exogenous effects, territorial endogeneity is mediated at the local level by inherited structures, institutional complexities and spatial differences. This confounds the analysis because of the difficulties of partitioning the mixed effects of globalization and localism. Such ambiguity further exacerbates the puzzle of multiplicity of farming styles.[3] Future CF research therefore needs to go beyond the traditional value chain and combine commodity-specific and sectoral dynamics and, consequently, reveal the diversity of agrifood market and territorial environments.

[3] Ménard and Klein (2004) note the variation in agrifood organizations in the United States of America and the European Union from the viewpoint of history, path dependency and local conditions. For example, European farms tend be smaller than those in the United States and more tightly interwoven with urban agglomerations, so that European agriculture is more closely tied to local economic, demographic and cultural differentiation.

2.5.3 Sociopolitical dimension

Market power at the sectoral and supply chain level and sociocultural elements at the territorial level are, however, only one dimension determining contractual forms (see Figure 2.1). Behavioural norms that are rooted in rural communities, with their embedded social capital, are also decisive. Agricultural contracts feature distinctive simplicity, and their enforcement pervasively relies on informal mechanisms such as conventions, reputations and repeated interaction (Allen and Lueck, 2002). Neither the traditional production-market perspective nor the NIE approach to organization is able to cover the full CF concept. While the NIE approach fails to explain the origins of agrarian settings, the production-market perspective cannot explain how adaptive institutional arrangements may support (or undermine) rural development. Neither explains how social norms can be mobilized to facilitate the sustainability of contract arrangements (Lazzarini, Miller and Zenger, 2004). To understand better the multiple trajectories of contracting in agrifood markets, studies on local networks and formal and informal institutions are crucial (Hart, 1997). Such studies, however, are scarce.[4]

2.6 A DEVELOPMENT AGENDA

A myriad of studies on CF have sought to explain its existence, economic efficiency and distributional effects (Glover, 1994; Glover and Kusterer, 1990; Henson *et al.*, 2008; Key and Runsten, 1999; Little and Watts, 1994). The intellectual popularity of CF is increasingly reflected in operational development strategies (World Bank, 2007). To complement the richness of the literature and bring a multidimensional perspective into the analysis of this institutional arrangement, the following important themes merit further elaboration.

2.6.1 Employment effects, labour decisions and transformation

Contract farming is by nature an institutional variant in the agrarian economy in that poor farmers are relegated to being hired on their own land. Discovering the disguised wage relationship between growers and contractors is crucial to observe the dynamics of rural transformation in the context of globalization and the emerging agribusiness. Farmers may contract with domestic retailers (or processors) directly as independent suppliers. They may also work as tenants for parastatal entities or they may transform to the wage-earning classes as casual workers (on a task-by-task basis) or permanent workers (on multiple tasks). As a result, globaliza-

[4] From a more sociological perspective, the propositions of NIE in the agrarian literature are criticized for their crude separation between purely economic relations and relations involving "non-economic" forces (Hart, 1997). Quite often, the enforcement of agrarian contracts invokes extra-economic coercion such as interlocked input and credit. In her illuminating article, Hart (1997) suggests: "[T]he processual approach taking shape in the agrarian literature grounds the exercise of power in specific institutional and political-economic contexts. A key insight is that struggles over material resources, labour discipline, and surplus appropriation are simultaneously struggles over culturally constructed meanings, definitions and identities. Social institutions are conceived of not as bounded entities of social structures but as multiple, intersecting arenas of ongoing debate and negotiation, the boundaries of which are fluid and contested ... [The] processual understanding of multiple trajectories at different societal levels provides a means of navigating between the determinism of 'only one thing is possible' and the voluntarism of 'everything is possible'... ".

tion and liberalization sweep the agrifood market in developing countries and affect the dynamics of agrarian society.

The employment effects of CF have on- and off-farm elements. On-farm employment is regarded as a major benefit of CF investments because of the labour intensity of crop production (Little, 1994). To the extent that farmers are vertically coordinated with downstream traders, the pathway varies by which agriculture is transformed. The more smallholders are integrated with buyers, the less diversified are their sources of income and the more likely it is that farming will evolve into a wage-based activity without changing land property rights. Yet strong coordination may imply increasing dependency and indebtedness. The on-farm employment effects are therefore influenced by the extent to which transaction costs are reduced. Policy interventions that mitigate risk and support *ex ante* investments promote the on-farm employment associated with CF.

CF also creates indirect off-farm opportunities. When transaction costs are (partially) mitigated by contractual arrangements, then processors, traders or retailers have incentives to invest in physical and human assets (such as packing, storage, transportation, extension services and other supporting services), which generate spillovers to labour demand in the rural economy. Since most processing facilities for products such as fruit, vegetables, sugar and tea are located near production zones, CF has high non-farm employment effects. Nevertheless, Little (1994), after reviewing various CF studies in Africa, concludes that the non-farm employment effects are closely tied to the type of commodity produced and whether or not it requires processing or other value-added activities. For example, the contracted sugar and low-perishable vegetable schemes in Kenya have a worker to contract grower ratio of 1:6; i.e. for six contracted growers, one non-farm worker employment is generated, while for fresh-produce schemes, the spillover effect is not significant. Little (1994) therefore argues that, unlike agro-industrial schemes, the fresh-produce contracting schemes employ few off-farm workers.

Little's conclusion, however, is somewhat static. With improved information and logistic technology, commodity-specific constraints are changing. The emerging agrifood market imposes both opportunities and challenges for smallholders. In deploying and developing the supply chain, modern retailers not only shape production and market conditions but also affect the division of labour. Coordination of farmers with downstream retailers and processors shapes civil society on a social dimension in the rural economy, especially regarding the distributional effects discussed below.

2.6.2 Equity and social dimension

Rural farm and non-farm activities targeted at poverty reduction may have variable impacts in terms of distributional effects (Ravallion and Datt, 2002; Start, 2001). As CF has long been proclaimed a poor-targeted tool, its distributional effects should be examined from a broad perspective. Farmers are facing a mix of opportunities and challenges in the transforming agrifood markets. Evidence in Central and Eastern Europe, South America and Africa shows that the exclusion of small farmers is widespread where incentives and capacities are insufficient (Dolan and Humphrey, 2000; Humphrey, McCulloch and Ota, 2004; Maertens and Swinnen, 2009; Weatherspoon and Reardon, 2003). By contrast, a growing body of evidence

shows income improvements for small farmers in developing countries when they comply with standards along the agrifood supply chain. These pro-poor institutions feature the various uses of vertical contractual arrangements. For example, Dries and Swinnen (2004) find that a rise in contracting improves small farmers' access to credit, technology and inputs; and compliance with high standards in vertically coordinated supply chains implies increasing benefits. In a study on the contracting practices of smallholder vegetable farmers in Madagascar, Minten, Randrianarison and Swinnen (2009) observe that given the right incentives and contracting systems, small farmers can participate successfully in emerging high-value markets.

Furthermore, market structure determines the performance and distribution of various market segments of the supply chains. In an extreme case of a single monopsonistic multinational company, Maertens, Colen and Swinnen (2008) found complete exclusion of small farmers, which the authors called a "worst case scenario". In one case in the distinctive Chinese agrifood market, numerous upstream farmers, midstream trading firms and processors/retailers were in fierce vertical competition (Huang *et al*., 2007). However, when observing the fruit and milk sector in China, Huang *et al*. (2008) and Huang *et al*. (2010) found no exclusion of small farmers and increasing coordination in modern marketing chains all the way down to the farm level.[5]

In his review article on CF in Africa from a development perspective, Little (1994) notes that the benefits of CF have accrued to larger and more profitable plantations whose proprietors tend to be urban or semi-urban farmers rather than locals; the poorest farmers in the region are rarely recruited as contract growers. Moreover, employment demand is for more skilled, educated and knowledgeable farmers. Returns for labour in CF are low and it becomes a mode of income diversification for poor farmers.

Small farmers may have substantive cost advantages, particularly in labour-intensive, high maintenance production activities with relatively small economies of scale (Birthal, Joshi and Gulati, 2005). Furthermore, processors may prefer a mix of suppliers in order not to become too dependent on a few large suppliers (Swinnen, 2007). CF may "have future perspective when effectively organized". The inequality issue of CF certainly cannot be easily resolved. The interwoven effects between contractual forms and commodity-territorial-social complexities result in difficulties in explaining the existing mixed picture, while the diversity of CF arrangements and their varying successes represent a dilemma for accommodating both the monopsonistic buyer and benefits for smallholders. Agribusiness firms do have recourse to monopsonistic power in order to contain side-selling by farmers but countervailing mechanisms are also needed to protect the interests of contracting farmers. A continuing search is necessary for subtle institutional innovations to align farmers' and companies' incentives and reduce transaction costs and uncertainty (Poulton, Dorward and Kydd, 2005).

[5] While little evidence was found that the smaller farmers were discriminated against by contracting firms in China (Miyata, Minot and Hu, 2007), there is a tendency towards selecting a small number of medium-to-large firms (Hu *et al*., 2004).

2.6.3 Multiple trajectories and dynamics of contract farming

Globalization imposes mixed opportunities and challenges for developing countries, where domestic and regional markets may evolve along different pathways in response to the changing situation. A "bimodal" market segment of modern and traditional supply chains was predicted by Jaffee and Henson (2005; p. 99). Nevertheless, despite the centrally coordinated global inter-firm division of labour involving global outsourcing blessed by foreign direct investment (FDI), a much more nuanced and heterogeneous map exists within the agrifood system (Goodman and Watts, 1997). The process of restructuring in regional and national agrifood markets is set at multiple levels. Future research calls for an interdisciplinary perspective that combines NIE and social capital literature to illustrate how local complexities are embedded as well as illustrate the emphasis on the uneven and spatially differentiated impacts of globalization.

A multiple trajectory allows the state to play a viable role. Government efforts can become cost effective by coordinating activities along the supply chain (World Bank, 2006). The involvement of local government streamlines responsibilities and reduces the enforcement problem of complying with food safety standards. Shortcomings have also been noted here. The lack of cooperation among the contracting company, village cadres and farmers may eventually lead to the collapse of a venture (FAO, 2001).

A less common topic in current literature is the interaction between agricultural production-market organizations and technology. For example, advances in measurement technology allow for automatic sorting and grading into different quality classes. Such progress makes the use of quality-based payment relatively attractive (Hueth *et al*., 1999). For agricultural products that rely mainly on physical properties for quality measurement (shape, size or volume), technological progress undermines CF because processors can fulfil transactions on spot and open markets. Furthermore, the traditional role of the state in providing public goods to address market failures (such as those caused by lack of appropriate inputs by the private sector) is likely to be adopted by markets because of technological progress. Since market failures partly arise from non-excludability or non-rival externalities of private investments and from informational problems, progress – particularly in information and communication technology (ICT) – may enable previously non-excludable services and goods to be provided at a reasonable cost (Dorward, Kydd and Poulton, 2006). ICT, when applied in CF arrangements, affects agrarian society and social class. While localized social capital and social norms reduce transaction costs, emerging ICT reduces the importance of collective action efficiency benefits and may undermine the sustainability of farmer cooperatives. CF needs to be examined from a dynamic perspective and from the changing viewpoint of the state's role, technological progress and sociopolitical complexities.

2.7 CONCLUSIONS

In the context of technological progress and market liberalization, the domain and boundaries of the study of the organization of agricultural production, distribution and marketing have been changing. An increasing need for vertical coordination leads to more use of contracts as opposed to spot markets for mediating exchange between producers and their processing/retail customers.

As a hybrid arrangement between vertical integration and spot markets, CF faces the same dilemma as other incomplete contracts in that there are prohibitive costs in specifying the full range of contingencies and restraining opportunistic behaviour. As Williamson (1971) notes with insight, the advantages of vertical coordination "are not that technological (flow process) economies are unavailable to non-integrated firms, but that integration harmonizes interests ... and permits an efficient (adaptive, sequential) decision process to be utilized ... ".

The increasing need for vertical coordination is not limited to transactions between farmers and traders, processors or retailers, but results from overall integration of (smallholder) farmers into agricultural value chains. Farmers all over the world are experiencing that their production choices are being affected by the marketing strategies of their customers (or those of their customers' customers). Retailers or processors with a business strategy to sell high-quality products need to have guaranteed quality in their supplies. The need to reduce food safety risks, prove compliance with corporate social responsibility criteria, and comply with statutory requirements of tracking and tracing lead to more strictly coordinated value chains. CF arrangements are extremely effective tools for implementing strict value chain coordination. In short, while the traditional reasons for adopting CF, such as failing markets for farm credit and for inputs (seeds, fertilizers and crop protection) continue to be important, the need to strengthen vertical coordination throughout the agrifood value chain has recently become more vital.

This chapter has synthesized a variety of ideas regarding CF. Rather than serving as a review on existing thoughts, its origin and evolution are based here on NIE. A multidimensional viewpoint on CF at the commodity, territorial and sectoral, and sociopolitical level have also been elaborated to integrate this institutional adaptation into a broader context.

The resurgence of CF is far more than just an instantaneous response to the emerging global agrifood regime. It is reconfigured in new institutional relations and new divisions of labour such that contracting out production activities is a driving force on a social dimension. To analyse CF arrangements, a comparative governance approach that recognizes the alternatives and dynamics of governance structures helps to understand the synergistic relationship between theories and empirical findings (Joskow, 2005). A multidimensional perspective should be elaborated in empirical studies in order to understand better the idiosyncrasies and dynamics of CF.

Enthusiasm and inflated expectations about the development potential of CF should be constrained. Contracting schemes work well when they are adapted to local contextual complexities. With numerous variants, CF is far more than a tentative response to the imbalance between the concentrated (downstream) supply chain and the dispersed (upstream) growers, since it is an embedded institutional arrangement and its viability relies on local conditions. After all, CF diversity and variations are rooted in specific political and economic structures; they are linked to specific agricultural commodities and production processes. Food travels over long physical and social distances and the production, processing and trade of this commodity continue to be a highly distinctive economic sector.

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Chapter 3

An assessment of the contract farming system in improving market access for smallholder poultry farmers in Bangladesh

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3.1 INTRODUCTION

The poultry subsector is an important means of fostering agricultural growth and reducing malnutrition for the people of Bangladesh. Poultry meat contributes 37 percent of total meat production and 22 to 27 percent of the total animal protein supply in the country (FAO, 2003). The subsector has proved to be an attractive economic activity, accounting for 14 percent of the total value of livestock output and it is growing rapidly (Raihan and Mahmud, 2008). From 1970 to 1980, the poultry population growth rate was 0.7 percent, which increased to 4 percent per year from 1990 to 2005 (Begum, 2008). The current market is worth US$1 billion, with about 150 000 small and medium enterprises, and the sector employs nearly five million people directly or indirectly (The Poultry Site.com, 2007).

Although meat production has been increasing over time, the per capita availability (2.92 kg/year) is far below the minimum requirement (7.67 kg/year) (Begum, 2008). Moreover, local scavenging chickens dominate poultry production (86 percent), while the remaining 14 percent of meat comes from commercial farming systems – 90 percent from small-scale commercial farms and only 10 percent from large-scale farms (BBS, 2005). Huque and Stem (1993) found that small farmers in Bangladesh produced about 96 percent of eggs and 98 percent of chicken meat. This situation has not changed significantly since their findings.

Despite the contribution of the poultry subsector to the economy and livelihoods of small farmers, the production system is not adequately market oriented. Considerable obstacles need to be overcome before small farmers can obtain remunerative prices and profits from poultry production. This chapter explores ways to link small farmers with commercial poultry production systems and evaluate whether contract farming (CF) could improve market access for smallholder poultry farmers in Bangladesh.

The chapter is organized as follows. Section 2 gives an overview of the current poultry production and input-output marketing system in Bangladesh. A case study of CF in the Bangladesh poultry sector is discussed in Section 3. Section 4 discusses the effectiveness of CF in promoting smallholders' access to modern marketing channels, followed by a discussion of external factors in Section 5. Section 6 draws policy implications and conclusions.

3.2 OVERVIEW OF CURRENT POULTRY PRODUCTION AND MARKETING SYSTEM

3.2.1 Existing poultry production system

Poultry farming in Bangladesh can be broadly divided into two systems: (i) traditional rural backyard or scavenging system; and (ii) commercial system. In the first, several or up to 60 domesticated fowl are maintained either as a hobby or for non-commercial egg and meat production. These chickens roam in and around the farmer's homestead area which fulfils a major part of their feed requirements. The second system relates to farms that have more than 200 domesticated fowl maintained primarily for commercial egg and meat production, with housing, management and marketing facilities. Operationally, small-scale commercial producers in Bangladesh refer to those having fewer than 5 000 birds in each batch, whereas large-scale producers have more than this number. Most poultry farms in Bangladesh are in the small-scale commercial farm category.

3.2.2 Marketing system for poultry products

Transformation from backyard to commercial farming not only resulted from technological progress and sector development policy but also from institutional innovations in input delivery and marketing of outputs. The expansion of the commercial poultry sector has resulted in a decline in real prices of poultry products and consumption has consequently increased (Begum *et al*., 2012). The marketing system for poultry products is not yet well organized. Up to now, broilers have been sold as live birds on a weight basis and table eggs bargained for on the basis of 100 egg-lots.

Day-old chicks

Of the 120 hatcheries in the country, at present only 50 are fully functional – others are either partially operating or are temporarily closed. Fifty percent are located in areas where concentration of poultry farms is the highest and approximately 56 percent are involved in the production of day-old chicks (DOCs) from parent stock. Eleven are government owned (Saleque, 1999). The main hatcheries in Bangladesh are totally dependent on the import of parent stock from the United States of America, the Netherlands, France and Germany, among others. These foreign strains are sensitive to temperature, nutrition and management and, as a result, their productive performance in Bangladesh varies widely. However, buyers and sellers use strains of breeding stock as the main criteria to differentiate products.

Hatcheries use different brand names for broiler DOCs and some have established good relations with buyers by providing quality DOCs, which has established differentiated products in practice. Hatchery owners set the price of DOCs independently but also consider the reaction of competitors in the market. The

price of DOCs varies from month to month. For example, during 2010, the price of broiler DOCs varied from 18 to 75 taka[6], and layer DOCs from 12 to 75 taka (Chowdhury, 2011). There is no bargaining between buyers and sellers of DOCs at any point in the supply chain, since the market is basically supply driven. DOCs are usually sold in cash at a fixed price to farm owners and agents, but with a commission to agents. Hatchery owners sell the DOCs at the hatchery or through their sales centres directly or through sales agents to the poultry farmers. DOCs are usually packed in paper boxes or bamboo baskets. A few hatcheries use their own or hired trucks to transport DOCs from the hatchery to the sales centres or agents. Mostly, however, poultry farmers do not transport DOCs by specialized vehicles but use buses, rickshaws or vans, which is hazardous and increases the likelihood of chick mortality.

Poultry feed

One of the major problems in the development of the poultry subsector in Bangladesh is the lack of sufficient and appropriate feed (Mitchell, 1997). Both manufactured and mixed ingredient feeds are used in the subsector. The manufactured feeds of different feed mills available are not homogeneous in nature. The manufacturers differentiate poultry feeds based on quality, brand name, sales promotion and packaging. The marketing chain for feed is also different. Some feed manufacturers distribute feeds through agents, others use wholesalers and retailers, while others have their own sales centres. Taking into account market competition, feed millers set the price of feeds independently. They usually set the prices for wholesalers and commission agents (*aratdars*), giving little scope for bargaining, except that the commission rates may vary according to the volume of feed purchased. The millers usually promote their products through advertising and providing quality assurance and incentives such as differential commissions to wholesalers; some millers also provide incentives to farmers. Generally, feed manufacturers do fix prices for wholesalers, who sell feed in both cash and credit to retailers and farmers. Feed is a major cost in broiler production and accounts for 45–60 percent of total broiler production costs in Bangladesh (Begum, 2008; Sultana, 2009). In setting prices, some wholesalers charge a fixed margin on the total cost of feed marketed and others add a certain percentage of total costs as profit. The price of feed varies from brand to brand. For example, during 2010, broiler feed price per tonne varied from 30 000 to 32 000 taka, and layer feed from 24 000 to 27 000 taka (Chowdhury, 2011).

Most feed ingredients such as maize, meat bone meal, soybean meal and protein concentrate are imported and therefore sensitive to the movement in world prices. Poultry feed is mainly imported from Germany, China, Thailand, India and Taiwan Province of China. The exact number of feed mills in operation at present is not known, although it has been estimated that there are some 35 feed mills owned and operated by 850 dealers in the private sector that are producing and distributing poultry feed in the country. Nevertheless, production does not meet demand and distribution in rural areas is inadequate.

[6] Local currency (US$1 = 81 taka) (Bangladesh Bank, 2013).

Veterinary drugs

The mortality rate of poultry is high (35–40 percent) because of disease and predators. Poultry farmers usually carry out vaccination and medication for common poultry diseases (Newcastle, fowl pox, fowl cholera, fowl typhoid, coccidiosis, Gumboro). Although the government gives some necessary vaccines at low cost to help farmers, they nearly always urgently need to buy vaccines at high prices on the open market. However, vaccines are not regularly available throughout the country, especially in remote rural areas. Vaccination failure is common because of improper transportation and storage, handling and application. Most poultry farmers use vaccines without knowing the maternal antibody status of their flocks. The marketing chain for drugs is simply composed of the pharmaceutical companies that distribute drugs to the wholesalers, the wholesalers themselves and the retailers that purchase drugs from wholesalers and sell to poultry farmers.

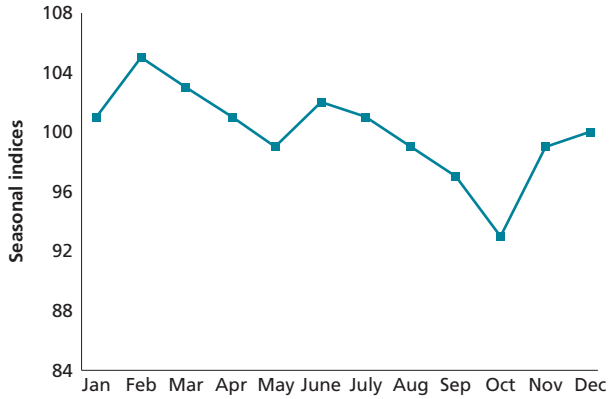
From the above discussion, it is clear that the poultry sector in Bangladesh is plagued with multifarious problems, including high input prices. Production risk is another leading problem. This mainly occurs in broiler farming through death or loss of birds. Outbreak of disease also causes considerable economic loss and erodes confidence in poultry farming. For example, Gumboro and Newcastle are both epidemic diseases and cause major losses. Apart from production-oriented problems, another main factor obstructing growth in the poultry sector is the lack of an efficient marketing chain, i.e. collection, storage, processing and marketing of poultry products. Farmers also face marketing problems. Previous research studies have emphasized that the main production-oriented problems faced by commercial poultry farms are lack of capital; inadequate knowledge of poultry rearing; outbreak of diseases; inadequate availability of inputs; inadequate institutional credit; and lack of guaranteed and profitable markets for outputs (Karim and Mainuddin, 1983; Ahmed, 1985; Haque, 1985; Islam and Shahidullah, 1989; Ukil and Paul, 1992; Bhuiyan, 1999; Uddin, 1999; Begum, 2005; Begum and Alam, 2005; Begum, Osanami and Kondo, 2005).

3.2.3 Poultry output price and marketing channels

Poultry outputs, particularly broilers, are live products. Therefore, if farmers fail to sell them at the right time, they face great losses. Thus, the biological nature of broilers is one of the most important causes of output price instability. Broilers are sensitive and cannot be stored for long without proper storage facilities, so they must be sold immediately. Moreover, market prices can fluctuate. Prices observed overtime are the results of seasonal patterns of change. Measuring seasonal variation is necessary to ascertain the short-term fluctuations in time series data. Average monthly wholesale prices of 1–1.5 kg poultry in the Dhaka market were used to measure seasonal price variations. Data were collected from the Department of Agricultural Marketing (DAM) and covered the period from January 1992 to December 2010. The ratio-to-moving average method was used in this study to measure seasonal variations. Figure 3.1 depicts the seasonal indices. As shown, poultry prices in February are 105 percent of those of the average month, the typical October price is 93 percent of those of the average month, and so on.

Poultry marketing channels are traditional marketing systems where the number of intermediaries is high (Figure 3.2). Consequently, farmers are sometimes forced to sell at lower prices because of inadequate market information, transport facilities, etc.

FIGURE 3.1
Poultry seasonal price fluctuations in the Dhaka market from 1992 to 2010

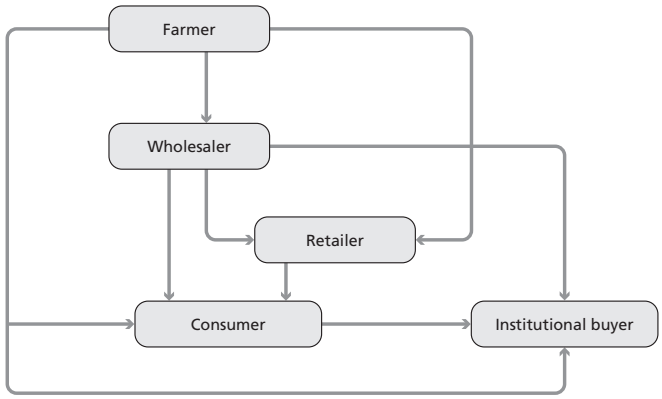


Source: Directorate of Agricultural Marketing (DAM), 2011.

Moreover, price spread is higher so that the prices received by farmers are not always remunerative. Chand *et al*. (2009) showed that, in 2009, cost of DOCs was 38 taka and production cost per bird was 94 taka, but because of price fluctuations farmers had to sell mature birds at 80–100 kg at the farmgate.

From the above, it is clear that poultry input markets are not competitive and demand/supply imbalance is a barrier to smooth functioning of the market, implying that the commercial poultry sector is not well organized in Bangladesh.

FIGURE 3.2
Marketing channels of poultry products



Source: Begum, 2008.

Nevertheless, modern technology seems appropriate for transfer to remote and small rural villages in Bangladesh, although successful transformation of this technology throughout the sector requires institutional support, particularly for poor and small farmers, to facilitate greater market access. This form of support has been changing dramatically in relation to the procurement practices, specifications and standard requirements of the various stakeholders (e.g. food manufacturers, wholesalers/exporters and retailers) up to final consumers. CF is an institutional initiative that could play an important role in mediating and bridging these issues/limitations that are largely out of reach of small-scale poultry farmers.

3.3 CONTRACT FARMING IN THE BANGLADESH POULTRY SECTOR

Contract farming offers several potential advantages over independent farming. It has been proposed as an important means for private farms to take over the role previously assumed by the state in the provision of information, inputs and credit (World Bank, 2001). It is the context of the contract that makes a difference, since there are many actors and factors in the environment influencing how the contract works and its outcome. The way farmers perceive CF defines their relationship with companies and differs widely across cultures (Asano-Tamonoi, 1988). In fact, there is so much diversity in farms, farmers, nature of contracts and socio-economic environments that it is better to focus on a specific situation than on the generic institution of CF. As CF in poultry production is a relatively new concept in Bangladesh, the pioneer company's profile and contractual agreements need to be reviewed.

The CF poultry system in Bangladesh was initiated by a large multipurpose company called Aftab Bohumukhi Farms Ltd (ABFL). Besides ABFL, other Non-governmental Organizations (NGOs) such as BRAC[7] and PROSHIKA[8] have come forward to support rural people by providing in-kind inputs or cash, by establishing CF and running small-scale poultry farms.

ABFL is one of the leading poultry farms in Bangladesh and was set up in 1991 at Bhagalpur in Kishoregonj district, about 110 km northeast of Dhaka. It is one of the subsidiary companies of the Islam group, predominantly engaged in the agricultural sector. ABFL first introduced CF for commercial broilers as an experimental extension programme for a selected group of 20 farmers who entered into a CF agreement with ABFL on the production and marketing of broiler products.

ABFL is different from integrated farms in other countries because it started as an agrobased farm and tends to include small farmers in its activities associated with poultry, dairy and agroservices. A key objective of the firm is to generate income for farmers and help look after their interests. As a result, ABFL includes all categories of farms, according to land size, in its contractual agreements.

In 1994, to develop the poultry farming system as an income-generating activity and enlist scientific and professional support, ABFL initiated an elaborate CF programme involving rural people. ABFL has its own feed mill and hatchery. The farm

[7] BRAC is the largest NGO in Bangladesh and uses poultry as one of many tools for poverty alleviation. It was involved with the Directorate of Livestock Services (DLS) in developing the semi-scavenging poultry model suitable for poor women.

[8] A large NGO with a livestock programme that includes work with poultry.

consists of a modern hatchery that produces 60 000 broiler and layer parent birds and supplies 100 000 DOCs per week for the fast growing poultry industry. The farm also has commercial facilities to supply eggs and poultry meat to consumers in Dhaka through conveniently located sales centres. The ABFL poultry complex is one of the largest in the country. Its feed mill was established primarily to provide balanced feed for the ABFL contract poultry farm, and was later expanded to meet the demand for poultry feed throughout the country. At present, ABFL has three feed mills with a capacity of 10 000 tonnes/month and distributes balanced feed to farms throughout the country using its own distribution system.

The nuances of the term "contract" in broiler production may vary from country to country and according to the nature of the integrator company. The agreements

TABLE 3.1
Salient features of ABFL contract arrangements in Bangladesh

1. Company name	Aftab Bohumukhi Farms Ltd
2. Company type	Private limited company
3. Products/services	▪ Commercial, live, dressed broilers ▪ Parent stock
4. Form of contract arrangement handled (to 2003)	Formal input-output (credit)
5. Form of contract arrangement handled (2004–2013)	Formal input-output (cash)
6. Backward linkage activities for contracted products/services	
(i) Package of inputs/services	i) Day-old chicks ii) Feed iii) Veterinary and medical services iv) Cash loans for operational expenses
(ii) Number of contract farmers (in 2003)	i) Commercial broilers: 560 farmers ii) Parent stock: 122 farmers
(iii) Geographic locations covered	Only Kishoregonj district
(iv) Volume of inputs/products delivered per month	i) Commercial broilers: feed 100 tonnes/ month ii) Parent stock: feed 1 000 tonnes/month
(v) Value of inputs/services delivered per month	i) Commercial broilers: 50 000 000 taka ii) Parent stock: 175 000 000 taka
7. Forward linkage activities for contracted products/outputs/services	
(i) Outputs/services	Own sales centre for dressed broilers, dealers for feed and chickens
(ii) Criteria for selecting contract farmers	All farmers in company area
(iii) Approximate market share of the company	10 percent for chicks
8. Provision for enforcement of contract	Mostly informal and social
9. System of ensuring product quality	Inspection, supervision, laboratory tests

Source: Begum, 2008.

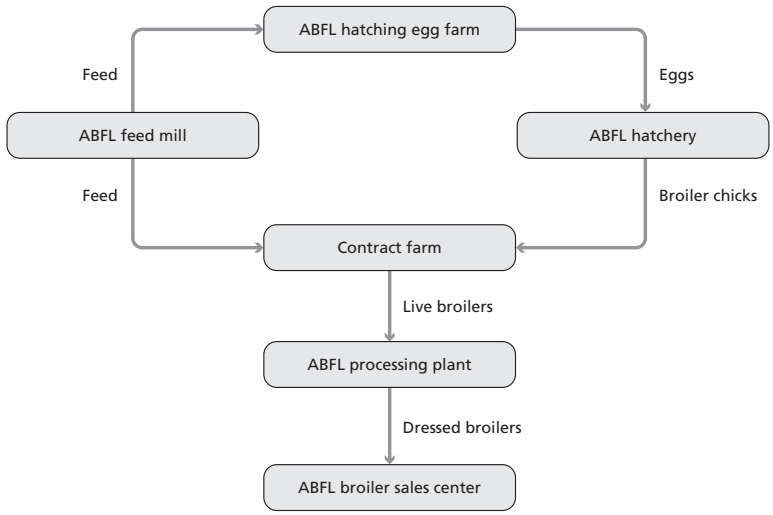
between ABFL and farmers are extremely simple. Any farmer located in the company area is eligible to enter into a contractual agreement.

The responsibilities of the contract farmer and ABFL in the vertically integrated farming system are shown in Table 3.1.

According to the agreements, ABFL extends credit facilities to farmers; provides DOCs, feed and in-kind veterinary supplies on credit; and implements final marketing of outputs. Feed and other inputs supplied by the contractor represent over 90 percent of total production costs, which means that farmers only pay 10 percent of annual average cost. Farmers build covered sheds at their own expense, ensuring a congenial and healthy environment for proper growth of the birds under the direct supervision of the ABFL experts. The average duration of the maturation cycle is five to seven weeks for a 1.5 kg broiler. ABFL buys mature broilers from the contract farmers by paying a fixed price per kg of live broiler and then markets these broilers at the ABFL sales centres in Dhaka. All credit liability of contract farmers is adjusted against the price of their products. In this way, farmers obtain financial support from the integrator with no interest and are able to run their business smoothly. However, the number of birds per batch to be reared and any managerial decisions to be made are taken by the farmers themselves. The vertical stages of the ABFL broiler CF system are shown in Figure 3.3.

Since ABFL incurred losses of nearly 150 million taka because of the bird flu outbreak in 2003, it subsequently changed its contractual agreement from credit to cash for inputs provided to farmers (i.e. DOCs, feed and veterinary supplies). However contract farmers still benefit from incentives because ABFL charges only wholesale prices for these inputs, which are significantly less than the market retail price.

FIGURE 3.3
The vertical stages of ABFL broiler contract farming



Source: Begum, 2008.

TABLE 3.2
ABFL's poultry insurance scheme

	Claim	
Premium	**Mortality rate**	**Refund**
1.50 taka per bird	0–3 percent	80 percent premium
	4–6 percent	40 percent premium
	7–10 percent	20 percent premium
	11–15 percent	10 percent premium
	Above 15 percent	20 taka per bird
	Within 20 days, deducting 15 percent	
	After 20 days, deducting 15 percent	30 taka per bird

Source: Begum, 2008.

Although ABFL began with 20 farmers under contract in 1994, and reached 650 in 2003, the number of contract farms slumped to 200 after the bird flu outbreak, then subsequently began increasing again after 2004. Begum (2008) calculated profit gain per bird from contract and independent broiler farming systems after the change in the contractual agreement, and found that even then, the contract farms made higher profits and had better incomes than independent farms.

Two risks exist in poultry production – production risk and price risk. Numerous CF studies have emphasized risk reduction as a principal incentive for producers to enter into contracts (Roy, 1972; Covey and Stennis, 1985; Dornbush and Boehlje, 1988; Herbert and Jacobs, 1988; Lawrence and Kaylen, 1990; Johnson and Foster, 1994; Knoeber and Thurman, 1995). There have been varying degrees of success over the years, across countries, with several types of insurance programmes (Hazell, Pomerada and Valdes, 1986; Hueth and Furtan, 1994; Mishra, 1996). ABFL is the only farm in Bangladesh to have introduced an internal insurance scheme to cover the risk of loss for contract farmers in the case of immature death of chicks through disease, etc. In the contractual agreement, payment to ABFL's growers depends upon production outcomes and not upon price outcomes so that farmers avoid price risks. ABFL's contract growers are free from production risks since the integrator provides technical assistance and insurance. ABFL's insurance scheme operates a contributory security fund. Farmers contribute 1.50 taka per chick to the fund at the time of purchase. For a certain percentage of chick mortality, a portion of the initial contribution or risk premium is refunded. For example, if chick mortality is less than 3, 4–6, 7–10 percent and 11–15 percent, then 80, 40, 20 and 10 percent of the contribution respectively is refunded to farmers. If the mortality rate is above 15 percent, farmers can claim full insurance compensation. In this case, for birds up to 20 days old, 20 taka is paid per bird after deducting 15 percent from the total number of birds lost. For birds more than 20 days old, 30 taka is paid per bird after calculating the benefits from birds up to 20 days old (Table 3.2). This means that lower mortality rates lead to higher rates of refunds on the premium, but higher (over 15 percent) mortality leads to full compensation for losses. Because of this measure, farmers feel secure and are encouraged to take up the CF option.

Integrators also face the above production and price risks in addition to anxieties about side-selling or extra-contractual marketing. Although disputes are apparently rare, any problems are generally settled through mutual negotiation between the affected parties.

3.4 EFFECTIVENESS OF CONTRACT FARMING IN PROMOTING SMALLHOLDERS' ACCESS TO MODERN MARKET CHANNELS

In an era of market liberalization, globalization and expanding agribusiness, there is a danger that small farmers may face difficulties in participating successfully in markets. Evidence suggests that in many countries these farmers could become marginalized as larger farms are targeted for more profitable operations. As in many developing countries, it is necessary to discover whether the benefits of CF reach small farmers in Bangladesh or not.

In many developing countries, small poultry farms play a central role in sectoral development. The main constraints of small-scale farmers are access to resources and markets.

- Small farmers often lack necessary production and marketing information.
- Small farmers may lack sufficient savings and the availability of external credit is limited because of bureaucratic complexities.
- Small farmers operate near subsistence level and are more risk averse than large farmers.
- Public intervention (such as public extension services and policies) to promote commercial poultry production has had greater impact on large farmers than on small farmers.

In the interests of both efficiency and equity, CF could be a viable institutional mechanism to facilitate small poultry farmers' access to credit, technical assistance and inputs, and reduce uncertainty in the marketing of outputs. If CF could be developed and policy biases towards large-scale commercialization reduced, then small farmers would be able to raise their incomes by adopting poultry farming as a main or subsidiary occupation.

One of the main reasons for involving small farmers in CF is that in developing countries the integrated farm faces difficulties in finding enough farmers to produce the quantities it requires. Moreover, large farmers sometimes try to break the contract rule. As economies of scale are associated with adoption of specialized technology, a vertically integrated farm usually tries to involve few large farms in its production and distribution system. However, CF has been a component of the most successful income-generating projects for small farmers in developing countries. Key and Runsten (1999) studied CF with reference to smallholder and rural development in Latin America. The study shows how CF functions as an economic institution and explores the causes of observed variation in the scale of outgrowers' production in the region. Ralston Purina, a feed company, became involved in contracting in the late 1950s, as growers became less able to handle market risks. Its contracts guaranteed growers a minimum return. Later, processors were brought into the vertically coordinated structure (Marion and Arthur, 1973).

Nevertheless, evidence from other countries suggests that the vast majority of CF schemes exclude small farmers (Singh, 2000). Capital-intensive large farms

make small farmers' entry into the contracting system difficult because of high transaction costs and economies of scale. The number of poultry farms decreased in developed countries such as Japan, the United States of America and Canada after the introduction of the vertically integrated contract faming system. In the mid-1990s, 80 percent of poultry production in Thailand came from only ten large companies (World Bank, 2001).

In Bangladesh, as noted, ABFL is different from integrated farms in other countries because it began as an agrobased farm and included all categories of farms, according to land size, in its CF system. There was possibly no special consideration for small farms but they were included so long as other requirements for poultry farming were met. Unlike vertically integrated farms in developed countries where large trading companies usually prefer contracts with large-scale farms to minimize transaction costs, ABFL has tried to be inclusive. One of its key objectives is to increase the incomes and improve the welfare of small farmers in the area around its headquarters. This may partly be motivated by the fact that the owner of the Islam group, of which ABFL is a subsidiary, comes from the locality, so any contribution to the well-being of the local people through his business ventures serves as both a financial and welfare objective.

Small farmers hold a strategic position in the economy of Bangladesh. They have limited working capital but they can provide abundant disguised family labour in the farming system. Although ABFL started with small farmers in its operation, it realized for two reasons that it is in its interests to contract large farms as well. First, because it encountered difficulties in finding enough farmers to produce the poultry needed. Second, the Government of Bangladesh restricted large-scale poultry farms by licensing to protect the small farmer. Begum (2008) found that ABFL's CF system is based upon the economic development of small farmers. Of 560 farms, about 93 percent were classified as small farms (with less than 2.5 acres/1 ha of land). By considering poultry flock size, of the 560 farms, 201 farms reared up to 1 200 birds/batch, 281 farms reared 1 201 to 2 000 birds/batch and only 78 farms reared more than 2 001 birds/batch. If the official classification of large farms (i.e. more than 5 000 birds/batch) is considered, then only three of the total 560 contract farms can be designated as large farms in the study area.

3.4.1 Smallholders' benefits from contract farming

Contract farming provides benefits to both the integrator farm and the contract farmers. The integrator farm guarantees a regular supply of raw materials while small farmers have access to a ready market for their products. Benefits from contract participation include improved market access, access to credit and technology, better risk management, improved family employment and, indirectly, development of a successful commercial farming system.

Contract farming and market access for smallholders

Small farmers in Bangladesh are generally unable to take advantage of market opportunities and often have trouble accessing credit, obtaining information on market opportunities or new technologies, purchasing inputs and accessing output-assured markets with fair prices. When markets are accessible, farmers may be subjected to price fluctuations or inequitable prices. For farmers, technical constraints in turn-

ing from scavenging-poultry farming to commercial poultry production are less daunting than market constraints. Therefore, one of the principal motivations for smallholders to enter into CF is having an assured market with favourable prices. Comparing the conventional and contracting systems, the marketing channel of the conventional one is more complex. In the contracting system, farmers sell their poultry directly to the integrator, which helps to reduce the transaction costs associated with searching, collecting market information, negotiation, etc. It also establishes the necessary backward and forward linkage, provides all marketing facilities, and increases producers' prices.

Contract farming, productivity and profitability differences

Contract farming generally implies that small farmers receive benefits from contracts in terms of enhanced net return. Begum (2008) showed that the difference in poultry production output between contract and non-contract farmers is statistically significant. Output for contract farmers (11 783kg/year) is much higher than that of non-contract farmers (6 763 kg/year). Productivity of labour is also higher. The profitability of poultry farming was measured in terms of gross margin and net profit. Begum estimated net return gain per bird for the two farming systems. The gross margin and net return (18.2 taka and 17.2 taka, respectively) of contract farms are again much higher than those of independent farms (12.9 taka and 10.0 taka, respectively.). In spite of these differences, both systems operate profitably.

Contract farming and efficiency differences

Contract farming is significantly related to farming efficiency. Begum *et al*. (2012) determined the level of technical, allocative and economic efficiency of commercial and independent poultry farmers. They also identified efficiency factors by examining the relationship between efficiency level and possible socio-economic factors. The study found the technical, allocative and economic efficiency of the non-contract farms to be 91, 89, and 81 percent, respectively, below that of contract farms (96, 98 and 94 percent, respectively). CF is more efficient, which might be expected because under contractual agreement, in order to obtain sufficient supplies of the right quality of poultry meat at the right time, ABFL provides technical assistance, production inputs and production credit.

Contract farming and income differences

Begum (2008) compared non-contract and contract poultry farm income with a non-poultry farm income. The average gross income of the non-poultry farm was 107 121 taka per year whereas the non-contract and contract poultry farm earned 76 653 and 127 833 taka per year, respectively, only from poultry enterprises. Contract farmers satisfied 55 percent of their total income from poultry production. The study concluded that if small farms enter into theCF system, they obtain substantial income gains.

Contract farming and risk reduction

Increased incomes in CF are generally accompanied by reduced price risks for farmers. Risk and uncertainty are quite common in the poultry business. Small farmers have little access to information and may face the risk of losing substantial

income if prices fluctuate downwards. With CF, a predetermined price for poultry is established during contract negotiations. Firms typically purchase products with the specified quality and quantity in accordance with the contract, and farmers are not subjected to the risks of sales losses through price fluctuations. The provision of insurance for farmers as an embedded service within the contract further reduces both price and production risks.

Contract farming and production capacity utilization

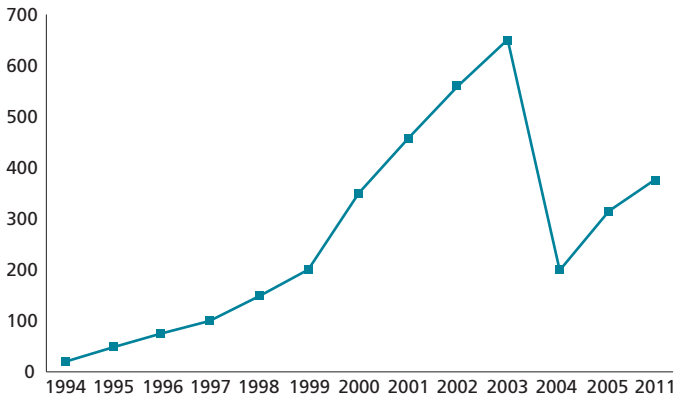
Contract farming can utilize production capacity more efficiently than non-contract farming. Begum (2007) found that, because of a lack of capital, non-contract farmers sometimes fail to rear the same amount of birds in every batch. If these farmers were to utilize the average maximum bird-rearing capacity per batch, then the average number of birds reared per year would be 8 239, yet only 4 251 birds (i.e. 51.5 percent of full capacity) were reared. In the case of the contract farms, the relevant figures are 10 466 birds, but 9 179 birds (i.e. 87.7 percent of full capacity) were reared.

Begum (2008) estimated that, even after bird flu, the net return per bird of contract farms is 1.4 times higher than that of independent farms.

As already noted, ABFL began with 20 farmers in 1994, reaching 650 in 2003 but, after the bird flu outbreak, in 2004 its contract farms slumped to 200. They subsequently increased to 315 in 2005 and 375 in 2011 (Figure 3.4). Small farmers began taking an interest in contract poultry farming because of its profitability.

It can be concluded that contract farming plays a major role in small farmer development. Existing rural credit institutions such as agricultural banks in Bangladesh do not have many of the features of ABFL's CF system, such as collateral-free input loans, assistance with access to input and product markets, opportunity to obtain technical expertise and supervised credit. CF is undoubtedly an effective way of producing quality poultry and this is substantiated in much of the literature.

FIGURE 3.4
ABFL contract farms from 1994 to 2011



Source: Begum, 2008.

3.4.2 Integrator's benefits from contract farming

Vertically integrated CF will be sustainable in the long term if both parties (integrator and contract farmers) benefit from the contract system. Begum (2008) showed how poultry farming is also profitable from the perspective of the integrator. In the study period, ABFL bought birds from the contract farmers at 52.5 taka per kg and sold them to its sales centre at 85.05 taka per kg. The gross revenue was 32.5 taka per kg. However, ABFL's cost elements include credit, input supply, staff hire, etc., which could be substantial, but cannot be estimated with accuracy. Therefore, 32.5 taka per kg was taken as ABFL's per bird gross return, not net return or profit.

3.5 EXTERNAL FACTORS ASSOCIATED WITH CONTRACT FARMING

There are good reasons for expanding CF, although concrete evidence of its benefits to smallholders is mixed. CF in developing countries has experienced mixed fortunes. Positive views maintain that contracts are a viable mechanism for incorporating small farmers into dynamic modern markets, in terms of substituting failing markets for credit, insurance, information; production factors; product outlets; and of diminishing transaction costs and enhancing technology transfer (Glover, 1984; Grosh, 1994; Key and Runsten, 1999). Conversely, other authors warn about certain undesirable welfare effects for smallholders (Wilson, 1986; Rickson and Burch, 1996).

However, like many developing countries, Bangladesh lacks the laws and legal framework to support contractual agreements. Agreements at times may not be easily enforceable or even legally binding. Since prices specified in contracts are based on expectations about future market behaviour, substantial variations in the realization of the expectation can lead farms to engage in contractual holdup. For example, the Bangladesh poultry sector was badly affected during the bird flu outbreak and prices varied significantly as a result. Since an effective enforcement mechanism was absent, poultry farmers could do nothing to avoid the negative impact. The integrator also faces problems when small farmers exercise opportunistic behaviour by misuse of the inputs supplied, consumption of part of the production or even side-selling to a third party, since feed conversion ratios (FCRs) are not at present adopted. External factors beyond the control of smallholders include delayed payment from the integrator, and abnormal price hikes in poultry feed and medicines. However, given the external factors that could undermine the system, ABFL is a successful CF story.

3.6 POLICY IMPLICATIONS AND CONCLUSIONS

The future outlook is positive for the Bangladesh poultry industry because the demand for poultry products is expected to increase, given its current low level of per capita consumption and the anticipated growth in population and household incomes. To compete, the industry must pursue production and marketing efficiency and the government must provide an environment that is conducive to the improvement of productivity. This chapter has shown that the contract poultry farming system in Bangladesh:

- is dominated by smallholders;
- is potentially a way of overcoming market imperfections, minimizing transaction costs and gaining market access for smallholders;

- has benefits including access to credit and technology, better risk management and enhanced family employment opportunities;
- increases productivity, profitability and efficiency and is a win-win situation.

Thus, CF could be an authentic way to produce quality poultry products and has the potential to be adopted extensively throughout Bangladesh to meet domestic meat requirements and generate export market potential.

Nevertheless, CF is not a mechanism to solve all production and marketing-related problems of poultry farms. It could be a way to minimize problems of capital, quality inputs, modern technology adoption and output marketing for small farms. ABFL's present contract poultry farming system has provided access to quality input and modern technologies by minimizing transaction costs within the value chains. Better institutional development may make smaller farmers more desirable partners for firms since many transaction costs that prevent them from contracting are a result of weak institutions. For example, if markets for information were better developed, farmers could directly access important production information rather than relying on the firm and its high fixed costs of extension services. Some of the barriers to the participation of smaller farmers in CF systems could be reduced through changes in the institutional structure of CF itself.

It is suggested that to increase poultry production and develop the poultry industry, the government and other private integrators should take initiatives to establish an effective and well-organized CF system in Bangladesh. However, successful CF implementation depends on the coordination and collaboration of both integrator and contract farmer. Favourable attitudes of the government towards the provision of incentives and policy supports are also essential factors for success.

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Chapter 4

Contract arrangements in China's pork production chain

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4.1 INTRODUCTION

Since the late 1980s, organizational arrangements in the agricultural sector in developed countries have been moving from the spot market towards closer coordination. For the pork industry, vertical coordination systems between producers and processors in most Western countries have dramatically shifted towards long-term contract coordination or vertical integration (Lawrence and Hayenga, 2002). Among a number of driving forces behind this shift are the levels of risk faced by agricultural producers, stringent quality requirements for processing and changes in technology (Fearne, 1999; Hobbs and Young, 2001). Moreover, consumers are more than ever before demanding that food be healthy, safe and environmentally friendly. This implies that the competitiveness of pork production in many cases depends more on the supply of safe and high-quality products than on quantity and price.

China is the largest pork producer in the world. Pork output reached 50.5 million tonnes in 2011, accounting for nearly 49 percent of the world's total pork production. However, the country only exported 324 000 tonnes of pork meat – 0.6 percent of total pork output (China Meat Association [CMA], 2012). It is widely acknowledged that the quality and safety of pork products are not up to the standards required by importers. With rapid economic development in China, food safety and quality have increasingly become an issue of concern among consumers. This poses challenges to the organization of pork supply chains. Pork processing companies are endeavouring to establish closer cooperative links with their suppliers and downstream customers in order to be competitive in the market. In March 2011, the scandal involving clenbutorol and Shuanghui (Shineway), the largest pork producer in China, highlighted the need for closer coordination between pork processors and their pig (meat) suppliers. Therefore, contract arrangements in the pork production chain require closer study, particularly in emerging economies where the production chain is dominated by small-scale pig producers.

This chapter is set out as follows. It first maps the pork supply chain in China, explaining existing procurement practices and downstream customer requirements. Subsequently, the specific market conditions that lead to the need for contracting are discussed. The third part focuses on existing forms of contracting within the pork

sector and how contracts have helped small farmers to better meet procurement requirements. In the fourth part, contract management in the four case study firms is described in detail. Finally, recommendations are made as to how contracting could be improved for buyers and sellers.

4.2 PORK SUPPLY CHAIN MAP

The conditions necessary for the development of the pork industry only began to emerge after 1978 with economic reforms in China. Since the 1980s, pork has dominated the market for meat and meat products. Although the share of pork in total meat production declined from nearly 86 percent in 1985 to 64 percent in 2011 (calculated according to the *China Statistical Yearbook*, 1986 and 2012), pork production will remain dominant in the coming decades.

4.2.1 Types of pig producers

There are three types of pig producers in China: unspecialized households (less than 500 pigs per year), specialized households (500 to less than 10 000 pigs per year) and commercial farms (10 000 pigs and more per year). In 2011, the proportion of pig supply from these three types was 65, 28 and 7 percent, respectively (*China Statistical Yearbook of Animal Husbandry*, 2012). Thus, pig production is still dominated by small-scale producers with less than 500 pigs per year. However, several reasons contributed to the government's encouraging the development of specialized producers and commercial farms. First, producers have given up pig production in favour of migration to cities for better job opportunities and higher incomes. Second, the increasing cost of grain and piglets has pushed producers to shift to other businesses. Third, consumers are more aware of meat quality and safety. Finally, consumers' preference for lean pork has sped up the development of specialized and commercial pig production. Compared with backyard pig producers, specialized and commercial pig farms use more advanced management practices, better swine breeds and improved animal feed.

4.2.2 Main pig production regions

Pig production is scattered throughout China. With the rapid development of swine production, grain shortages have increasingly become a major constraint. The Yangtze River area has traditionally been the key swine production and internal exporting zone. Northeastern China used to face pig shortages because of the colder climate. However this region is becoming self sufficient and is starting to export to other regions thanks to cheap regional corn supply and the high costs of grain transportation in other areas (Wang, Tian and Zhang, 2011). Table 4.1 shows the inventory and output of pigs in the major regional pig production areas in 2011. Figure 4.1 gives a better picture of the geographic location of swine production areas in China.

4.2.3 Pig slaughtering and processing: fragmentation and integration coexist

According to the Ministry of Commerce, approximately 600 million pigs have been slaughtered each year since 2006. Experts have predicted that it will be difficult to surpass a total inventory of 680 million pigs in China in the next decade. Pig slaughtering and processing enterprises are far from a homogeneous group. Operations

vary according to size, ownership, location, source of pigs and the markets they service (see Figure 4.2).

TABLE 4.1
Major pig production areas, pig inventory and output of pig production in China in 2011

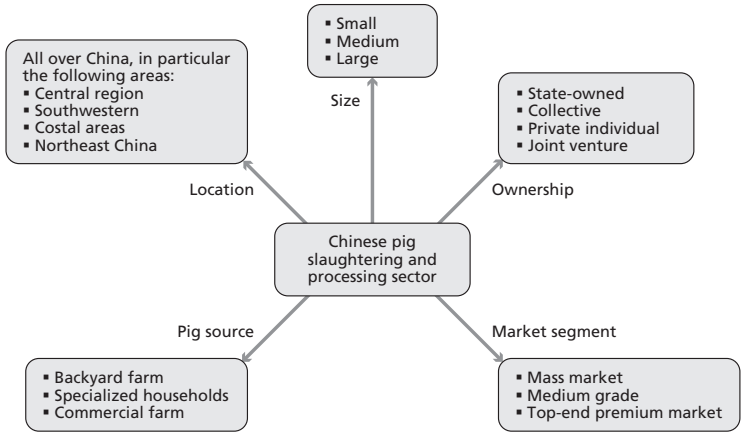
		Share of the national pig output (%)	
Region	**Provinces**	**Inventory**	**Output**
Central region	Hebei, Shandong, Henan, Anhui, Jiangxi, Hunan, Hubei	40.7	42.1
Southwestern China	Guangxi, Sichuan, Chongqing, Yunnan and Guizhou	28.4	25.5
Coastal areas	Jiangsu, Zhejiang, Fujian, Guangdong	14.2	15.8
Northeast China	Liaoning, Jilin and Heilongjiang	8.4	8.7
Percentage of these areas in total pig production		91.7	92.1

Source: China Rural Statistical Yearbook, 2012.

FIGURE 4.1
Major swine production areas in China

Source: Information from Table 4.1.

FIGURE 4.2
Dimensions of Chinese pig slaughtering sector



Source: adapted from Longworth, Brown and Waldron, 2001.

Size. The size of slaughterhouses and processors can be divided into three categories: small, medium and large. By Western standards, pig slaughtering and processing in China is on a very small scale. There are more than 20 000 designated pig slaughterhouses, of which only about 10 percent slaughter more than 20 000 pigs annually. The Ministry of Commerce has classified manufacturing firms into four types, according to their operation revenue. Large-scale firms have an annual revenue of more than 400 million yuan; medium-scale firms have an annual revenue of between 20 and 400 million yuan; small-scale firms have an annual revenue of between three and 20 million yuan; and mini-sized firms have an annual revenue of less than three million yuan. In 2011, there were altogether 3 277 scaled meat slaughterhouses and processors with total sales of approximately 930 billion yuan.

The Chinese meat industry is experiencing a period of consolidation and restructuring. Zhou Guanghong, chair of the Chinese Society of Animal Products Processing expects that, by 2020, large- and medium-size meat processors will control 70 percent of the market, mainly supplying large supermarkets (Zhou, 2006).

Ownership. Economic reform and market imperatives have placed great pressure on state-owned slaughterhouses to restructure. Pig abattoirs and processors have a wide range of ownership structure (Longworth, Brown and Waldron, 2001). From the 1950s to the early 1990s, the state-owned Meat Alliance plants were the major source of meat supply. However, they have been returned to private ownership in large numbers since the 1990s. The state and collective ownership is less important than the private, shareholding and joint ventures. With regard to foreign investment, some international players have already started operations in China, such as Goldman Sachs and Hormel Foods of the United States of America. Table 4.2 shows the ownerships, assets and sales of the 3 277 meat slaughterhouses and processors in 2011.

TABLE 4.2
Ownership of meat slaughterhouses and processors, assets and sales volume in 2011

Ownership	Number of firms	Assets (million yuan)	Sales volume (million yuan)
State-owned	105	5 377	19 542
Collectively owned	39	1 036	7 548
Foreign joint venture	212	91 605	176 089
Shareholding	115	36 732	74 042
Private	2 119	138 140	419 378
Others	687	94 382	233 748

Note. Only firms with annual sales of more than three million yuan have been included.
Source: Shuanghui – the Development Strategy Workshop on Meat and Foodstuff Industry 2012 and the Dialogue between China's Meat Industry and Vocational Education, Beijing, 2012.

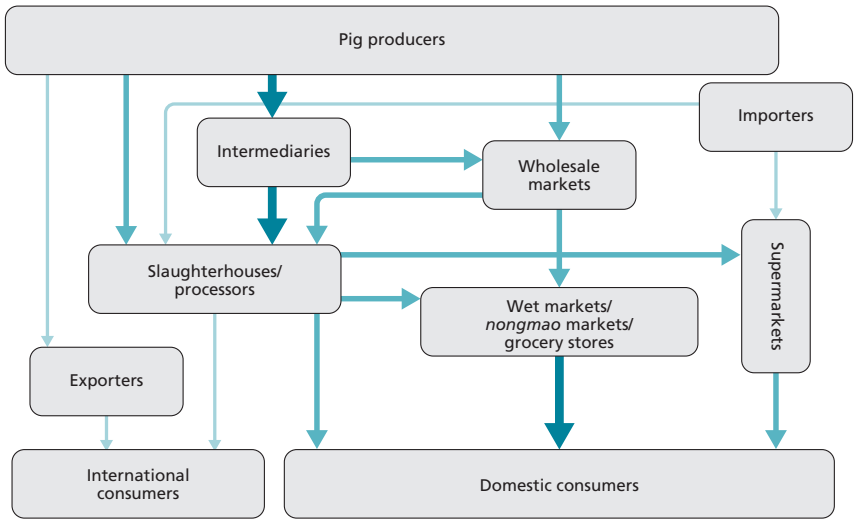
Market segment. Pig slaughtering and processing operations can be classified into three broad groups according to the type of market they service. The first group comprises private individual butchers and county- and township-level slaughterhouses. They usually provide non-graded fresh pig meat to mass markets in urban and rural areas. The second group consists of medium-grade slaughterhouses that service the middle-class premium market, although much of their product also ends up in the mass market in urban and rural areas. Some of the better-managed county- and township-level slaughterhouses also fit into this category. The third group of slaughterhouses supplies part of the carcass to the top end of the premium market, with the remaining cuts sold to the middle class and mass market. Slaughterhouses in this category include the modern and relatively large enterprises often constructed as part of agro-industrial or meat industry development projects. Another group of slaughterhouses in this category are the joint ventures. To meet the requirements of the premium market, these slaughterhouses need to source better-quality pigs. In many cases, they contract farmers or suppliers with specific requirements on feeding, management and physical criteria (Longworth, Brown and Waldron, 2001).

4.2.4 Pork distribution and marketing

Distribution of pork products (including offal) reaching end consumers varies from the simplest systems to rather complex channels. Current pork markets in China consist of wholesale markets, retail markets (mainly wet markets and supermarkets) and international markets. The role of international markets for pork can almost be ignored as pork exports in China only account for about 1 percent. The bulk of the meat is distributed through wet markets and travels along very short (in terms of time and space) local marketing chains. Figure 4.3 depicts the marketing channels of pork products.

Wholesale markets. Only when market reforms took root in 1985 did wholesale markets in China begin their rapid development. Until the mid-1990s, these markets were usually owned by municipal governments or state-owned enterprises as a

FIGURE 4.3
Pork market structure in China



Note: Arrows indicate product flows. The size and colour of the arrows indicates the relative importance of the channel.
Source: field survey data.

reflection of the government's perceived responsibility to provide urban citizens with stable, low-priced food. Moreover, these entities had the best access to finance while private agents still faced constraints in legally establishing their businesses. Since then, the situation has changed and there has been a mass entry of private companies (Hu *et al*., 2004). The government made great efforts in setting up market entry and monitoring systems (OECD, 2006). In 2011, there were 2 565 agricultural commodity wholesale markets with annual sales of above 20 billion yuan. Total sales reached 499.8 billion yuan. Among the agricultural commodity markets, there were 48 nationwide pork wholesale markets with a transaction value of 1.5 billion yuan (*China Trade and External Economic Statistics Yearbook*, 2012).

Wet markets. A wet market can be defined as a place where local farmers and traders supply pork products to consumers. Nowadays, many wet markets in cities are being closed or consolidated since local authorities view them as unsanitary. The outbreak of the severe acute respiratory syndrome (SARS) in 2003 is viewed as an important factor in accelerating this process. In addition, tax revenues from wet markets are small compared with other better regulated markets. In some areas, local authorities have decided to transform wet markets into supermarket-style venues where multiple vendors can operate in a cleaner and better regulated environment (Bean, 2003; Poon, 2006). However, wet markets remain the most popular retail outlets in rural areas and small towns. In the markets, butchers sell fresh pork products on wooden tables and facilities are rather rudimentary.

Nongmao (agricultural commodity) markets vary from very large markets with hundreds of separate stalls located in specially constructed, sometimes multistorey buildings, to open air markets with a large number of stalls or small, simple markets consisting of a few stalls. They are open all day and most stall operators are full-time traders. The operations are licensed and inspected by the local branch of the Industry and Commerce Administration (Longworth, Brown and Waldron, 2001). In *nongmao* markets, most stallholders sell fresh pork products. However, some stallholders also sell cooked and other processed pork products, such as sausages and ham. In some of the more sophisticated and highly developed *nongmao* markets, several major Chinese meat companies have installed what could be described as Western-style butchers' shops. These shops/stalls have freezing facilities and display products in glass cabinets.

Supermarkets/hypermarkets. In the mid-1980s, supermarkets sprang up in large cities throughout China and, since the late 1990s, supermarkets, hypermarkets and convenience stores have spread rapidly in the 60 largest cities and have become a major force in retailing. In addition to the major coastal cities, supermarkets are now also gaining a foothold in second- and third-tier cities all over the country (Reardon, Timmer and Berdegué, 2003; Bean, 2003). Traditional offerings in supermarkets have been cooked meat, frozen meat or processed meat products sold over delicatessen counters. Since the late 1990s, there have been offers of a wide range of vacuum-packed and branded processed pork and pork offal products from open-fronted chilled cabinets.

Compared with domestic supermarket chains, foreign-invested hypermarkets have a better-managed cold chain for meat products. Popular foreign hypermarkets include Carrefour, Metro and Walmart. These hypermarkets, together with the large Chinese supermarket chains, usually have a limited number of suppliers of meat products. These carefully selected suppliers are mostly integrated commercial-type producers that can assure both product quality and consistency in supply (Fabiosa, Hu and Fang, 2005).

Future development in pork consumption in China will see the following trends.

- The proportion of pork consumption when eating out will increase.
- Urban residents will consume more beef and poultry products. Pork consumption will decrease in absolute terms. However, pork consumption will continue to increase in large rural areas.
- With rising incomes and a faster pace of life among the working middle class, convenient and smaller retail packs will continue to gain consumer popularity. Ready-to-eat meat packages offer convenience to consumers and therefore show market growth potential for processors.
- Consumers are increasingly concerned about food safety and quality. This will drive companies to invest more in quality management. Technology investments will focus on safety, hygiene, convenience, cost-effectiveness and environmental friendliness.
- Companies will become more brand-oriented. Large firms such as Yurun and Shuanghui are investing more in promotions, such as television commercials, sample trials in shops and price discounts to win customer loyalty.

- Supermarkets are becoming the major channel for urban consumers, especially for the younger generation. Local supermarket chains are allocating their stores in the expansive rural areas of China, especially in the economically developed eastern areas.
- Speciality shops will become more important channels for large and medium pork processing companies.
- There will be an increasing demand for pork products that are convenient and healthy: small packages and chilled cuts in cities; low temperature Western-style meat products among middle-class urban households; frozen meat in rural areas with the availability of refrigerators; ham and sausages in rural markets.
- Pork prices will increase and remain volatile (more than US$4/kg in 2007 and again in 2011).
- More foreign investment can be predicted in the meat sector in China. For example, Goldman Sachs has invested in the top two meat processors in the last five years. Top meat processors have become listed companies.

4.3 MARKET CONDITIONS FOR CONTRACTING

As mentioned earlier, conditions required for the development of the pork industry only began to emerge in China after the economic reforms of 1978. In the agricultural sector, two major policy changes (reforms) were particularly important. The first was the dismantling of the communes after 1978 and the introduction of the household responsibility systems (HRS). Under the HRS, individual households were able to lease allocated plots of land, take ownership of livestock and receive returns based on output. The HRS greatly stimulated agricultural development. The increased production and demand for agricultural commodities that it triggered spawned a proliferation of rural markets in which households and state companies could trade "surplus" agricultural commodities. By 1985, with the exception of pork-price stabilization measures, the market for livestock and meat products (together with fruit and vegetables) was decontrolled. This move to free markets for most agricultural products was the second major reform that paved the way for the rapid development of livestock production (Longworth, Brown and Waldron, 2001). However, the HRS also created problems for agricultural modernization and governance of the supply chain, especially difficulties in tracking and tracing management.

Empirical studies have been conducted in China to investigate market conditions for contracting in agricultural production. Sun and Liu (2011) examined the relationship between market factors and the degree of vertical coordination in broiler production in Jiangsu province in 2006. They found that broiler producers preferred production contracts with agents (intermediaries) and that production scale was an important factor contributing to contracting. Guo *et al*. (2011) investigated the factors on selecting contract forms by farmer households to market their agricultural products in Jiangxi province from 2005 to 2006. They found cooperatives and intermediaries preferred to cooperate with producers through oral contracts. In addition, price volatility was favourable for oral contracts, while the more difficult it was to sell products, the more likely written contracts would be used. Distance of the markets and government support were also positively related to written contracts. The focus in this chapter will be on the major market conditions influencing contracting in the pig production sector in China.

4.3.1 Small-scale farming economy

China's agriculture is characterized by scarce land, abundant labour and small-scale production using little mechanization. In general, fragmentation characterizes agricultural production. Table 4.3 shows how fragmented the pig production sector is in the country.

The proportion of pig producers with an annual inventory of less than 500 was 65.5 percent in 2009. However, the proportion of this group of small-scale producers was 89.3 percent in 2003. In recent years, the Chinese Government has promoted specialized production and provided financial support to larger-scale operations. Therefore, the proportion of specialized producers with an annual inventory of 500–9 999 pigs reached 27.8 percent in 2011, 19.6 percent higher than in 2003. Commercial farms with more than 10 000 pigs per year also increased from 2.5 percent in 2003 to 6.7 percent in 2011.

Small-scale production may result in a number of problems. These include the following.

- *Unstable supply*. Because of information asymmetry, small-scale producers do not always understand market demand and often make decisions based on their experience or follow their neighbours.
- *High handling costs*. One of the major reasons repeatedly stated by the case study firms explaining why they did not contract with small-scale pig producers was the high handling costs of many small suppliers.
- *Uncertain quality*. The complexity of quality and safety management and their associated costs makes it difficult for small-scale producers to follow quality specifications.
- *Insufficient quality control* through upstream and downstream channels makes it difficult to track and trace product quality.
- *Limited insight into production methods*. Small backyard household producers still engage in traditional pig production practices and, although the number of larger-scale producers is increasing, they are not well trained in pig production technologies. In March 2013, a report also found an overuse

TABLE 4.3
Scale of pig production in China in 2011

Production scale (annual inventory)	Inventory of pigs per production category at the end of 2011 (10 000 head)	Percentage of total pigs
Below 50	33 149.50	35.49
50 ~ 499	27 988.10	29.97
500 ~ 2 999	17 874.90	19.14
3 000 ~ 9 999	8 190.60	8.77
10 000 ~ 49 999	5 269.70	5.64
More than 50 000	927.10	0.99
Total	**93 399.90**	**100.00**

Source: China Statistical Yearbook of Animal Husbandry, 2012.

of antibiotics and heavy metals in commercial farms in China (http://finance.sina.com.cn/china/20130311/115614789456.shtml).

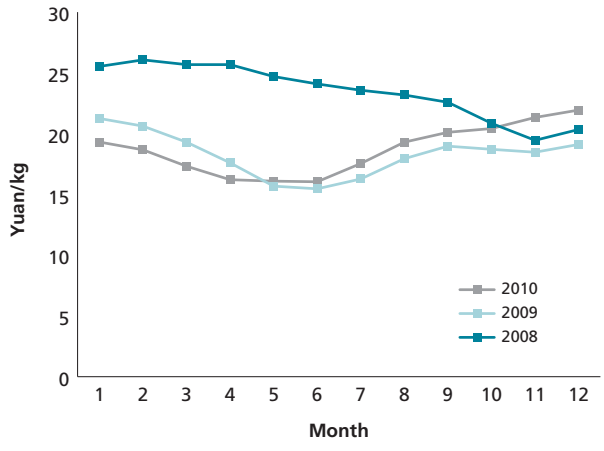
4.3.2 Price fluctuation

In China, pork prices fluctuate every three to five years. After a period of high prices from the beginning of 2007 to the first half of 2008, pork prices showed a decreasing trend from the second half of 2008. Figure 4.4 indicates pork price volatility during 2007 and 2009. Another peak in pork prices came in 2011. According to the National Bureau of Statistics of China, food prices in 2011 increased by more than 13 percent over the previous year, with the price of pork contributing to about half the increase. In addition to the increasing price of raw materials for pig production such as corn and soybean meal, the shortage of supply caused by fewer pig producers and disease were also important factors in rising prices (http://www.chinapig.cn, accessed on 17 July 2011).

4.3.3 Quality and safety management

Food quality and safety have become serious problems in China, especially over the last five years. Frequent media reports have highlighted safety problems in the pork sector caused by drug residuals and *clenbuterol* poisoning. The most recent *clenbuterol* scandal was reported during World Consumer Rights Day on 15 March 2011. Shuanghui, the largest pork processor, was hit hard by recalls of products from supermarket shelves and shifts of business agents to other meat processors. Increasing incomes and changing lifestyles generated by rapid economic and social development will drive China's pork industry to emphasize safety, quality and convenience in the future (Han, Trienekens and Omta, 2011). However, the current pork industry is characterized by the dominant position of smallholder pig produc-

FIGURE 4.4
Change in pork prices from 2008 to 2010



Source: China Statistical Yearbook of Animal Husbandry, 2011.

ers and slaughterhouses. The organization of such a fragmented pork chain induces problems in tracking and tracing pork from "field to table". It is therefore critical to seek better supply chain governance to solve the quality and safety problems in the pork industry. Empirical studies such as Sun, Chen and Li (2009) and Han, Trienekens and Omta (2011) have confirmed that contracts contribute positively to quality and safety in the pork sector.

4.4 FORMS OF CONTRACTS AND THEIR ROLE IN LINKING SMALL-SCALE PRODUCERS TO MODERN MARKETS

Contracts are agreements to undertake future transactions under predefined conditions (Poppo and Zenger, 2002). Contracts outline a selection of promises, obligations and outcomes, procedures for monitoring and dispute resolution, and penalties for non-compliance. Two major types of contracts are often recognized by management and marketing literature: legal contracts and relational contracts. The former are enforced by law, while the latter are embedded within social norms (Cannon, Achrol and Gundlach, 2000). This chapter deals with both oral and written contracts in the pork sector in China. In the governance structure spectrum, a contract is a hybrid governance mechanism, which may include strategic alliance, joint ventures, production and marketing contracts, as well as cooperatives.

Unlike the more integrated broiler sector, the buyer-seller relationships in pork supply chains in China are still dominated by spot market transactions. In a 2005 empirical survey of 218 pork processors in Shandong and Jiangsu provinces conducted by the first author of this chapter, more than 60 percent of respondents indicated that they procured most of their pigs by spot market transactions. However, nearly half stated that they traded with their most important suppliers on the basis of contracts. Sun, Chen and Li (2009) examined the competition and cooperation relationships among pig farmers (376 respondents), pork processors (146 respondents) and supermarkets (239 respondents) in 15 provinces of China, excluding the northwestern region, which is not a major pig production area. Lengths and the general terms of contracts such as quality requirements, price settlement, and monitoring and conflict settlements were the major focuses of their survey. They found the length of the contracts signed by the pig farms and the pork processors was mainly two to three years. About 21 percent of the producers signed one-year contracts with the processors, while nearly 49 percent signed contracts lasting two to three years. Only one-third of the producers signed contracts for more than three years. According to contract theory, shorter lengths of contracts are more subject to short-term behaviour of buyers and sellers and are not favourable for the sustainability and stability of collaborative relationships. Sun, Chen and Li (2009) also studied four important terms in the contracts: decisions regarding quality grade, price settlement and adjustment of pig price, monitoring of contract enforcement and dispute settlement.

- *Decisions of quality grade*. Pig quality was decided upon by the pork processors, pig production cooperatives and commercial farms, in particular the pork processors. Regarding the price settlement mechanism and quality standards, only about 28 percent of the pig producer respondents were aware of these terms. The survey highlighted the dominant position of the pork processors in deciding the quality grade and the unawareness of pig producers in clearly understanding specific quality standards.

- *Price settlement and adjustment*. Price is the major factor influencing benefit distribution among the supply chain members and deciding the stability of the pork supply chain. Pig prices were mainly decided upon by the market and by negotiation between the pig producers and the processors. Nearly half of the respondents agreed with the market price settlement mechanism. When the contract price is different from the market price, only 19 percent of the pig producers mentioned that the price settled by the contract was implemented. Most of the respondents (both pig producers and pork processors) confirmed price negotiations between both parties. However, pork processors were in the dominant position.
- *Monitoring*. In contract enforcement, it is important to overcome opportunism either from buyers or sellers. In monitoring pig producers, about 96 percent of pork processors relied on the terms of the contract. The frequency of inspection was that 23 percent of processors made a visit once a month, 44 percent once a season and 9 percent every six months. About 24 percent of the processors made random inspections. These inspections consisted of nine areas: feed quality, veterinary medicine, disease control, production environment, facilities, pig urine, pig behaviour, health of the producers and animal welfare. Among these, the first five areas of concern, in order of importance, were disease control, feed quality, veterinary medicine used, production hygiene and facilities. Of the food safety scandals reported in recent years, pork safety problems mostly resulted from illegal additives in feed, such as *clenbuterol*, chemicals and heavy metals. Thus, feed is one of the most important elements in contract management. However, less than 30 percent of the processors provided feed to the producers. In terms of contract breaks, about 15 percent of the producers mentioned that the contract was terminated after breaking the contract only once, 72 percent twice, and 10 percent more than four times. Pork processors paid great attention to quality in pig procurement. If the standard of the pigs did not meet their requirements, processors refused to procure the pigs, decreased pig prices, or postponed procurement.
- *Dispute settlement*. Disagreements mainly arose from price and quality. Producers cared more about prices than the quality of the pigs, while both were equally important for processors. Negotiation and compromise were the only way to solve the problem when disputes arose.

Small-scale producers may face a number of market failures for which contracts provide suitable alternative structures/situations from spot markets.

- *Secure marketing channels*. Because of lack of knowledge about market operations and limited transportation facilities, small-scale producers are often constrained in access to profitable markets for their products. By signing contracts with pork processors, producers can secure guarantees for selling their products.
- *Reduction in price risks and information asymmetries*. The pork supply chain is subject to severe volatility in China. By signing contracts with processors, producers know in advance the price(s) that processors will pay to them. On the open market, producers can only depend on prevailing market prices and their own bargaining ability. Contracts help overcome price risks. Conversely,

processors communicate with producers about market demands, which helps to reduce information asymmetries.

- *Reduction in transaction costs.* Contracts can save producers time and effort in searching for buyers and negotiating prices. They can also save transportation costs since processors may offer transportation.
- *Access to production inputs, technologies and services.* Pork processors are the leaders of the supply chain in China. They cooperate with universities and research institutes to adapt to new developments in pig breeding, production and quality management. Small-scale pig producers involved in contractual relationships with processors can obtain more support from processors in terms of production inputs such as feed, technology extension services and veterinary services.
- *Product quality*. The stringent pork market needs processors to be confident about the source of their procurement. By signing contracts, processors can monitor the production process and facilities of the producers and producers can obtain access to more information on quality standards. They may be more committed to meet quality standards because they are bound to lose if their product does not meet the quality standards as agreed in the contract (Masakure and Henson, 2005). Contractual arrangements also make quality assessment more manageable. Although product quality from small-scale primary producers may be difficult to guarantee, processors will certainly be better off obtaining from contracted producers with a stronger motivation to produce good-quality products than sourcing the same products from spot markets (FAO, 2001; Kambewa, 2007; Da Silva, 2005).

As with any form of contractual relationship, contract farming has potential risks. Problems or concerns include side-selling by producers to competing buyers, especially when market demand is more than supply. Another concern is the potential for buyers to take advantage of small-scale producers because of their weak position. Therefore, producers may not obtain the same benefit as buyers in the contract. For developing countries, another problem may be timely payment. Buyers can delay the time when they pay producers. As time passes, both sides may develop conflicts of interest, which hinder the sustainability of the contract.

4.5 EMPIRICAL STUDY OF CONTRACTING IN THE PORK PRODUCTION CHAIN

4.5.1 Company profile

The four case study firms are located in the eastern and middle part of China. Three firms, with the exception of Firm C, which was established in 2004, have a history of more than 20 years. All have witnessed tremendous growth and rank in the top 50 in the meat sector. The general profile of the firms is shown in Table 4.4.

4.5.2 Procurement and marketing channels

With the exception of Firm C, which procured 70 percent of its pigs from outside Jiangsu province, the other three firms depended substantially on pig supplies within their provinces. The proportion of that dependence was up to 95 percent. Firm B, with more than 200 subsidiaries all over China, secured pigs around 20 km away from the branch firms. The sources of various suppliers are shown in Table 4.5.

TABLE 4.4
General profile of the four case study firms

	Firm A	Firm B	Firm C	Firm D
Time of establishment	1986	1992	2004	1988
Location	Shandong province	Jiangsu province	Jiangsu province	Hunan province
Ownership	Private, listed	Private, listed	Co., Ltd	Once state-owned, now listed
Employees	3 500	More than 100 000	1 500	300
Number of pigs slaughtered in 2010	1.5 million	More than 31 million	1.2 million	More than 300 000
Output value (yuan)	8 billion	64.7 billion	1 billion	410 million
Sources of pig procurement	Within province: 98 percent Outside province: 2 percent	20 km away from firm	Within province: 30 percent Outside province: 70 percent	Within province: 95 percent Outside province: 5 percent

Source: first author's field survey data in 2011.

TABLE 4.5
Sources of pig supplies for four case study firms

	Firm A (%)	Firm B (%)	Firm C (%)	Firm D (%)
Specialized producers (less than 10 000 pigs)	10	5	10	80
Intermediaries*	10	80	60	15
Pig farm (more than 10 000 pigs)	40	10	20	5
Vertically integrated farm	40	5	10	

* Intermediaries are those agents who collect pigs from small scale producers and specialized producers and sell the pigs to slaughterhouses and processors.
Source: first author's field survey data in 2011.

Fresh pig meat is the major product of the four case study firms, but they also produce processed meat products for hotels. Table 4.6 shows the marketing channels of the four firms.

In terms of market coverage, all the case study firms sell most of their products to markets within the province. The proportion reached more than 90 percent. Two percent of Firm D's pig meat went to international markets.

TABLE 4.6
Marketing channels of the case study firms

	Firm A (%)	Firm B (%)	Firm C (%)	Firm D (%)
Supermarkets	20	35	60	27
Agrocommodity markets	5	–	10	5
Franchise shops	15	35	10	12
Meat wholesale markets	5	20	–	35
Self-owned shops	20	9	15	8
Groceries	5	–	–	–
Others*	30	1	5	13

* Others refer to Firm A: exporting raw materials; Firm B: retail in firms; Firm C: frozen pork; Firm D: large customers and raw materials for processing within the firm.
Source: first author's field survey data in 2011.

4.5.3 Contract terms

Background of the contract agreement

All case study firms stated that it was quite difficult to sign contracts with small-scale producers directly (backyard producers with less than 100 pigs). It is critical for them to sign formal written contracts with pig suppliers to obtain stable and continuous raw materials. There are no alternative forms of governance for Firm A or B. Firms C and D use about 20 percent oral contracts. Firm A signed contracts with intermediaries (agents), professional pig producers, pig production alliances and cooperatives. The contracts last six months. The target suppliers of contract signatures for Firm B are production farms, intermediaries and specialized producers. Compared with the other three firms, contracts for Firm B last longer, up to two years. Firm C signed contracts with specialized producers, large- and medium-size production farms and intermediaries. Contracts last for a season or a year. Firm D focused more on specialized pig producers compared with other firms. Other contracting groups include intermediaries, pig production cooperatives and large-scale producers. Contracts are usually for one year. All four firms categorize their contract partners to improve the effectiveness and efficiency of contracts.

Contracts include general terms, such as the obligations of the two parties, supply quantities, quality standards, payment method, length of contract, legal obligations and dispute settlements. Firm C also mentioned pig breeds and planned inventory at the end of the year. Firm D mentioned disease control requirements and the obligation to fulfil pig supply plans. Regarding the renewal of contracts with their partners, the highest percentage was 90 percent, which was reported by Firm C. Both Firm A and Firm D have an 80 percent renewal rate, while Firm B renewed contracts with 75 percent of its suppliers. Generally speaking, the percentage of satisfaction in the buyer-seller relationship is good. The major reasons of contract termination for Firm B are unstable quality, disease outbreak and producers' shift to other businesses. Firm D terminated contracts because of producers' failure in meeting disease control requirements and their application of forbidden drugs and antibiotics.

Characteristics of contracts

The responsibilities of each partner are a vital part of the contract. The major contents of the contract include qualification checks on both suppliers and buyers, payment, on-time delivery, and quality and quantity requirements. Table 4.7 shows the results of case study firms in terms of responsibilities, guidelines on cultivation practices, specifications on product quality, financial services, transportation arrangements and contingencies for contract failure.

Assessment of effectiveness of contract arrangements

The case study firms mentioned similar benefits for small-scale producers (mainly specialized pig producers and intermediaries).

- Producers were provided with access to production inputs, such as feed, vaccination and veterinary services. Firm D mentioned that credit could also be provided to producers.
- Producers' productivity could be improved as technicians from the firms visited the producers and provided them with the latest technological developments.
- Producers had better access to markets. Their marketing problems were solved and their rights could be protected during slumps in the market.

The study firms mentioned similar benefits from contracting: stability in pig supply, quantity and quality guarantees, and savings in transaction costs. Firm A said that their suppliers could secure pig marketing channels. In the production process, suppliers could obtain technological support from the firm. Transaction costs were reduced by obtaining veterinary input and vaccinations from the firm. Firm B mentioned that its suppliers' production initiatives were stimulated and production scales were enlarged. The firm-farmer household cooperation model of Firm C helped pig suppliers to understand markets better and improved their productivity through technological and management services provided by the firm.

The other side of the coin is the risks involved for both contracting parties. Firm A indicated the risk of epidemic disease for producers while the firm itself had to carry the market risk. When price fluctuation is high, Firm B said that contract enforceability is reduced. Price volatility is therefore the major risk for Firm B. Firm C said that contracts brought them more benefits than risks and it had not encountered any serious risk. During slumps in the market, the risk for Firm D was excess supply. When it reaped strong markets, the producers' profit could not be maximized.

Firms usually take the following measures to secure contracts. They facilitate producers' initiatives to produce good-quality pigs by paying better prices, and build good and trusted cooperative relationships with producers by providing them with technological and management services. Although China has improved its legal systems since 2000, enforcement is still a problem and lawsuits are time consuming. Contracting failure is inevitable. Firm A only had 3 percent of its contracts not fulfilled. Suppliers having difficulty in providing a stable supply of pigs and shifting to other businesses are the two major reasons. When contract failure happened, Firm A gave a warning or discontinued cooperation. The firm said that it was difficult to find effective solutions. For Firm B, it was critical to establish trusted relationships and it provided as much support as possible when difficulties rose. Price volatility and disease outbreak were the two major factors for contract failure. Firm C indi-

cated 5 percent contract failures, which were caused by regional price differences and suppliers' transfer to other businesses. For Firm D, 80 percent of the contracts could be secured, while the 20 percent failure rate was caused by price volatility.

4.5.4 External factors

Although contract default was not particularly high among the four case study firms, they stated that contract enforcement was still a difficult task because of the characteristics of the sector and the current stage of agricultural development in China. In particular, the price volatility of pig meat, outbreaks of epidemic disease and food safety scandals have tremendously affected contract maintenance. It is rather difficult for buyers and suppliers to include these in the contracts. As both suppliers and buyers cannot predict market demand and price changes, it is inevitable that the contract price deviates from the market price. Eventually this has resulted in broken contracts. Information asymmetry and uncertainty also result in non-completion of contracts or high costs in drawing up comparatively complete contracts.

In recent years, government authorities in China have made a great effort to improve food quality and safety and maintain market stability. The pork price surge in 2011 contributed 57 percent to the percentage of Consumer Price Index (CPI) increase. This was the highest in the past three years. The central government had to allocate financial support to slow down the pressure on various stakeholders in the chain. For example, in July 2011, a total of 2.5 billion yuan was invested to support the development of standardized pig production farms and zones. Each fertile sow received a subsidy of 100 yuan. This was the second largest allocation of funding to the pork sector since 2007. Other measures included improving the national disease control systems as well as providing credit and insurance services to pig production farms and zones. For instance, subsidies were given to farms if pigs were killed for controlling epidemic diseases (http://news.qq.com/a/20110714/000186.htm?pgv_ref=aio [in Chinese]). These policy incentives have helped the development of the sector to some extent. However, case study firms expressed concerns over the continuous and sustainable development of the pork sector as policy incentives were often short term. It is still very difficult for large groups of small producers to benefit from these policy incentives. The firms called for long-term efforts by government authorities to improve the legal framework and availability of financial services to support contract procurement.

Since the early 1990s, the government authorities have encouraged "dragon-head enterprises"[9] in each county of China to cooperate with small-scale household farmers as the problem of disconnect between small-scale household farmers and large markets has had a great impact on the progress of agricultural industrialization

[9] Dragon-head enterprises refer to the leading companies in local areas. In the mid-1990s, the Chinese Government strongly promoted the idea of these enterprises and provided incentives for their establishment and development. The purpose was to strengthen the link between farmers and processing and marketing companies and raise farmers' incomes. Leading companies were selected by the local government authorities to contract with hundreds of individual farmers in their region and procure, process and market agricultural products. Under the contract, farmers provide labour and land, while the enterprises provide seed, operating loans, fertilizer and technical expertise (Poon, 2006).

TABLE 4.7
Characteristics of contracts

	Firm A	Firm B	Firm C	Firm D
Responsibilities and obligations	*Suppliers*: provide pigs up to the standard of buyers *Firm*: provide overall technical and information services	*Suppliers*: meet quality standards, legal production, follow the norms of the firm to upload, transport and download pigs; ask firm to provide information on price change and quality grading standards *Firm*: inspect product quality, advice on quality improvement, require suppliers to show "market pass" of related authorities; fairtrade and on-time payment	*Suppliers*: guarantee quantity and quality of pigs *Firm*: accept pigs according to quality requirements, quantity to be met, payment to be made on time	*Suppliers*: pigs free of disease, forbidden drugs not allowed, water-injected pigs forbidden. Have the right to monitor procurement process and check financial records *Firm*: guarantee fair accounting. Have the right to punish suppliers not following regular guidelines for pig production
Guidelines on cultivation practices and/or specifications on product quality	*Cultivation practices* *Space requirements for each pig* Lactating sow: 3.3 m^2 Young weaned piglet: 0.3 m^2 Young pig: 0.6 m^2 Fattened pig: 1 m^2 Stud sow: 1 m^2 Stock boar: 2 m^2 Within contract period, farm cannot be transferred or subcontracted to others *Quality requirements*: national standard of pig production, weight 90–110 kg; forbidden drugs not allowed; no drugs for 60 days before pigs are slaughtered	*Cultivation practices*: there are specifications on cultivation practices Traceability is required (not specified) Both sides sign quality guarantee and traceability agreement emphasizing safety and high quality, meeting market requirements	*Cultivation practices*: scientific cultivation, standardized management, forbidden additives and drugs into feed not allowed *Quality requirements*: no forbidden drugs, no chemical residues, disease free, lean-fat ratio	*Cultivation practices*: disease control, legal production, hygiene of production facilities, clear water, fine breeds, forbidden drugs not allowed *Quality requirements*: disease free, limited chemical residue, weight 90–110 kg, breeds, animal welfare, castrate time not too late
Credit/advance financing and repayment options	Not available	Not available	Not available	Available

TABLE 4.7 *(continued)*
Characteristics of contracts

	Firm A	Firm B	Firm C	Firm D
Transportation arrangement*	Suppliers are responsible for delivery. Three certificates are compulsory	Suppliers are responsible for delivery. During transportation, suppliers are required to pay attention to animal welfare. No excessive feeding, water and sand feeding allowed (note by authors: to put on more weight in selling pigs)	Most of the delivery is made by suppliers. Firm is also involved in part of transportation. Animal welfare during transportation is required in order to reduce number of dead and injured pigs	Suppliers are responsible for delivery. Three certificates are compulsory. Friendly uploading and downloading are required
Price agreements	Contract protection price is established between the two parties. Regular account settlement. Payment is made every 15 days according to Product Delivery Order	Market price mechanism. Regular account settlement. Payment is made every three days according to Product Delivery Order	Market price mechanism. Regular account settlement. Payment is made every four days according to Product Delivery Order	Market price mechanism. Payment is made the second day of delivery
Quality-based incentive	Good-quality pigs receive higher price. Specific grading system is guideline for payment	Better quality, higher price	Quality indicators are agreed before contract is signed. Price is decided according to the indicators after pigs are slaughtered. Better quality, higher price	Different grades have different prices. Suppliers with stable and high-quality pigs are given more orders
Contingencies for contract failure	Other suppliers in inventory are contacted for pig procurement. Friendly negotiation and problem solving. If there is no agreement, both sides go through lawsuit process	Other suppliers in inventory are contacted for pig procurement. Friendly negotiation and problem solving. If no agreement, both sides go through lawsuit process	Other surrounding suppliers are contacted for pig procurement	Emergency scheme is available for contract failures

*Three certificates in pig transportation are compulsory: animal quarantine certificate, vehicle disinfection certificate and non-epidemic disease zone certificate.
Source: First author's field survey data in 2011.

in China. These "dragon-head enterprises" established production bases to involve small-scale producers. Through contracting with production bases, small-scale producers have been provided with better marketing channels. The "enterprises + production basis + farmers" model became the most popular governance structure in agrifood supply chains. In October 2006, the Law of the People's Republic of China on Specialized Farmers Cooperatives was promulgated. Since then, farmer producers' cooperatives have developed rapidly under government initiatives. In some regions, the local animal and veterinary bureaus worked together with entrepreneurs and producers to establish cooperatives.

4.6 CONCLUSIONS AND RECOMMENDATIONS

In an era of marketing liberalization and globalization, one major concern in China is how to integrate small-scale primary producers and entrepreneurs into modern markets as well as the global market economy. Contract farming in the pork industry has been an important step to help small-scale producers gain access to resources and improve producers' competitiveness. To facilitate the more effective and sustainable development of contract farming, it is critical to improve the following areas.

First, more communication and mutual understanding should be established between pork processors and producers so that trusted relationships and long-term cooperation can be achieved. In China, pork processors are the leaders of the chain and producers are usually in a weaker position. Better communication and trusted relationships enable producers to obtain more information and solve the problem of information asymmetry. The bargaining power of the producers can thus be improved.

Second, producers' cooperatives need to be strengthened. The major obstacles of keeping small-scale producers from contracting with processors are unreliable supply, unstable quality and the difficulty of tracing when quality and safety problems arise. It is therefore important that small-scale producers be better organized into cooperatives. Entrepreneurs are needed to take the lead and negotiate with processors on behalf of producers.

Third, a better functioning macroeconomic policy environment is needed to promote the healthy development of contract farming. The Chinese Government has made a great effort to change its macroeconomic policy environment along with an increased flow of trade, capital, technology and information throughout the country. A more conducive environment to foster economic growth has been established. However, government policies towards small-scale farmers still have to be revised. A long-term view and sustainable policy tools in government incentives are needed to promote pig production in China, such as improving the insurance system to subsidize producers during outbreaks of disease and increasing the capacity of the national meat reserve to smooth over shortages in supply. In addition, the enforceability of legal frameworks should be strengthened to improve regulatory effectiveness and efficiency.

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Chapter 5

Integrating smallholders in the South African citrus sector

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5.1 INTRODUCTION AND BACKGROUND

Following the dismantling of international commodity agreements in a context of globalization, agrifood markets have been restructured, becoming increasingly consumer driven and vertically integrated. Restructuring of markets has resulted, among other things, in the increase of centralized procurement and supermarkets in developing countries (Reardon and Timmer, 2007). In this context, market integration is seen as an opportunity for smaller farmers as it represents a possibility to access new restructured markets while reducing transaction costs and increasing their production and farm income (World Bank, 2007). As such, among other integration mechanisms, contract agriculture – although it may be selective, excluding and subjecting the smaller and worse endowed farmers to high risks and agribusiness normalization (Poulton, Dorward and Kydd, 2010) – is generally considered an attractive way for integrating small farmers into the open market economy (Runsten and Key, 1996).

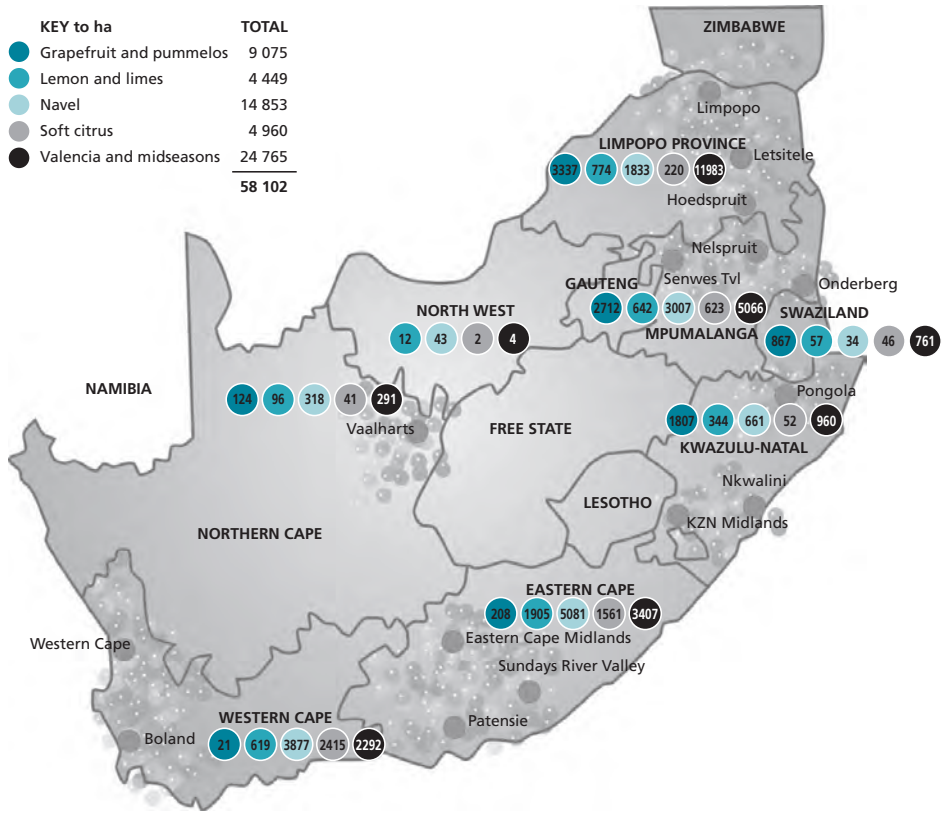
South Africa is characterized by identical trends. First, the country has a highly unequal farming sector, an apartheid "legacy" that excluded black farmers from resources, market-oriented agriculture and mainstream food markets (Anseeuw and Mathebula, 2008; Louw *et al*. 2008). In 1994, the date of the first democratic elections, about 60 000 large-scale white farmers occupied 87 million ha, mostly privately owned land on which they farmed about 95 percent of South Africa's total agricultural production. On the other hand, 14 million black people, still gathered on the former homelands, were engaged in smallholder farming, mainly for self-consumption. Only about 13 percent of these people could occasionally commercialize part of their production and only 0.2 percent of households could effectively live off the land (World Bank, 1994). In this context, restructuring agriculture represents not only a decisive element of ideological transition, but is also one of the conditions of sociopolitical stabilization, and a solution to reintegrate the previously marginalized smallholders is thus primordial.

Second, from the early 1990s onwards, liberalization offered new hopes to overcome the duality of agriculture. The market environment has changed, with the withdrawal of the state from farm development, the establishment of centralized

buying and distribution centres and the concomitant decline of traditional markets, the emergence of private norms and the integration among value chains (Sautier *et al*., 2006). These changes have resulted in a shift towards preferred suppliers' marketing systems – such as contract agriculture models – to procure directly from farmers capable of meeting the requirements in volume and quality of restructured markets (Reardon and Timmer, 2007). Contract agriculture has been considered as a way to integrate black smallholders in the mainstream agricultural economy. Recognized as a planning priority in South Africa, guidance is needed for the key economic players in agriculture to exploit the potential of this instrument (FAO, 2004), which could become a tool in South Africa's agricultural restructuring and the integration of its previously marginalized farmers.

The objective of the chapter is to contribute to the debate on the prospects of contract agriculture in South Africa and its implications for agricultural market restructuring. Focusing on contract farming in the citrus sector, it will assess

FIGURE 5.1
Distribution of citrus production in South Africa



Source: CGA, 2010.

whether or not smallholder farmers can be successfully and sustainably integrated into restructured and liberalized markets through contracts with agribusinesses.

After this introduction, the next section will detail the implications that macroeconomic restructurings and global market transformations had on the country's citrus sector. The following section, based on two case studies, will present an in-depth characterization of the patterns of contract procurement, with a focus on smallholder citrus farmers. Before the conclusion and the recommendations, a section will analyse the effectiveness of the contractual arrangement and will discuss the external factors that affect the likelihood of establishing and sustaining procurement contracts between small farmers and agribusinesses.

5.1.1 The South African citrus sector and its restructuring

Citrus production spreads across South Africa according to agroclimatic patterns: from grapefruit in the subtropical Mpumalanga, the north west, Limpopo and the Northern Cape; oranges in the Eastern Cape, and mandarins and easy peelers in the Mediterranean Western Cape (Figure 5.1).

The citrus sector currently produces 86 million tonnes yearly on 58 000 ha. It contributed ZAR4 720 million (rand) in 2009/10, which represent 4 percent of the Agricultural Gross Product at national level (DAFF, 2010). As the 12th largest producer in the world, South Africa is the third largest world citrus trader. The country exports over 60 million cartons per year (60 percent of the volumes produced are exported, which represent 10 percent of world trade), mainly to Europe (in particular, the United Kingdom), the Russian Federation and the Middle East. The processing industry represents around 25 percent of the volumes produced, and local sales only account for 15 percent of production (CGA, 2010).

Over the past decades, three major evolutions have occurred in the governance patterns of trade and regulation in the citrus sector. These are the liberalization and deregulation of agriculture, the development of a complex environment shaped by private norms and standards, and in-depth restructuring and the emergence of oligopolistic actors dominating both production and trade.

5.1.2 The liberalization process of a mostly export-oriented sector

Like most economic sectors in South Africa, the citrus sector was well organized and strongly regulated by the state until the 1970s. Its organization can be traced back to the late 1800s with the establishment of several citrus growers' organizations, among which the Western Province Fruit Exporters' Association, founded in 1899, and the Fruit Growers' Cooperative Exchange of South Africa, formed in 1922. In the 1920s, with the aim of promoting and regulating exports better, the Perishable Products Export Control Board (PPECB) was founded, taking over the organizations' responsibilities regarding perishable products for export. It was complemented by the Citrus Exchange Board, formed in 1927. As a public body, it promulgated policies aiming at regulating trade and controlling quality: the Fruit Export Act in 1914, the PPECB Act in 1926, and the Marketing Act in 1937. At the end of the 1930s, it also established Outspan, originally an Eastern Cape citrus trademark, as the only channel through which all citrus fruit was exported. Not only did these acts and initiatives partly regulate the sector, together with the Cooperative Societies Acts of 1922 and 1939, the Native Administration Act of 1927 and the Land Act of 1936, but

they also set the scene for the racial segregation of agriculture through dispossession, coercive labour legislation and support for white farmers (Vink and Kirsten, 2000).

From the early 1980s, related to domestic political forces enhanced by pressures emerging from the General Agreement on Tariffs and Trade (GATT) negotiations for the abolition of quantitative import controls and the introduction of tariffs on agricultural commodities, the agricultural sector, including the citrus sector, faced increasing deregulation and liberalization pressures. These included: (i) a general reduction in the use of price controls and registration requirements as instruments of marketing policy; (ii) shifts towards more market-based pricing systems away from the cost-plus pricing procedures that had traditionally been used; and (iii) the dismantling of the marketing boards and parastatals (Vink and Kirsten, 2000). Control measures used for local citrus marketing ceased, export controls were cancelled and the board changed its status to that of a private company known as Outspan International in 1994. By the end of 1995, anyone could apply to register as a citrus export agent. Besides the establishment of a number of exporters, Outspan and another firm of the deciduous fruit sector, Unifruco, amalgamated in 1997 as Capespan. Because of its origins, Capespan has continued to play a major role in the citrus sector and still exports about 60 percent of South African citrus fruit.

5.1.3 A new regulatory environment based on private standards

In parallel with the aforementioned liberalization and deregulation, growing concerns have emerged regarding the safety and quality of citrus fruit in South Africa. These concerns can be backtracked from the 1910s, when the inspection of all citrus fruit for export became compulsory (CGA, 2010). However, standards have become increasingly strict and almost mandatory since the 1980s. They refer to technical, safety, sanitary, environmental and social considerations, with regard to more specific developments related to new patterns in food demand (Vermeulen *et al.*, 2006). Standards have become the primary trade regulatory mechanisms in the citrus sector and, therefore, the ability to address these concerns adequately determines the level of access to markets. Considering the origin of these standards (domestic/international, public/private), several layers of considerations appear.

On the one hand, the Agricultural Product Standards (APS) act provides regulations relating to the grading, packing and marking of citrus. According to the trade markets, the requirements for quality, volumes to be supplied, production practices and accreditation differ. The minimum requirements for a producer, packing house and exporter to trade products of plant origin have to comply with the South African export regulations that fall under the national food hygiene and food safety standards issued under the APS act. DAFF issues a Production Unit Code and a certificate to each citrus producer complying with required standards. PPECB has a statutory responsibility to ensure that standards are maintained and applied, according to the requirements established by DAFF. Considering the export orientation of the citrus sector in South Africa, standards applied in the sector are strongly aligned to international markets.

On the other hand, the export sector also faces safety standards applied in many northern countries, particularly in Europe, which is the main importer of South African citrus. Standards such as the Hazard Analysis Critical Control Point (HACCP), International Food Safety, Good Agricultural Practices (EUREP/GlobalG.A.P.),

British Retail Consortium, Safe Quality Food, as well as organic labels and other private voluntary standards to ensure social accountability (SA8000, Nature's Choice, Max Havelaar, fairtrade, Business Social Compliance Initiative, Total Quality Management, etc.) are applied in the different segments of the value chain (Jooste, Louw and Idsardi, 2007). In addition, European retailers develop their own protocols and pass them upstream to developing countries' exporters. These protocols have been translated in strict standards, often more stringent than national regulatory safety requirements (Okello and Swinton, 2007; Jaffee, Henson and Diaz Rios, 2011).

5.1.4 An ongoing restructuring dominated by oligopolistic actors

The evolutions mentioned above led to important restructuring in the citrus sector. However, contrary to what one might have expected at the end of the apartheid era, i.e. a more inclusive society, restructuring involved the dominance of oligopolistic actors, concentration at both upstream and downstream levels, and the emergence of preferential supply market channels (Urquhart, 1999).

On the production side, the situation has remained dualistic. Approximately 1 400 medium- to large-scale (0.5–500 ha) mostly white export-oriented growers still control over 80 percent of volume, while a further 2 200 smallholders (mostly black, with each having on average less than 100 trees) produce for local markets (Philip, 2006). Even if land reform can be expected to change ownership patterns, implementation remains slow (5 percent of the area in 15 years) and often unsuccessful (90 percent of redistributed farms collapse) (Anseeuw and Mathebula, 2008).

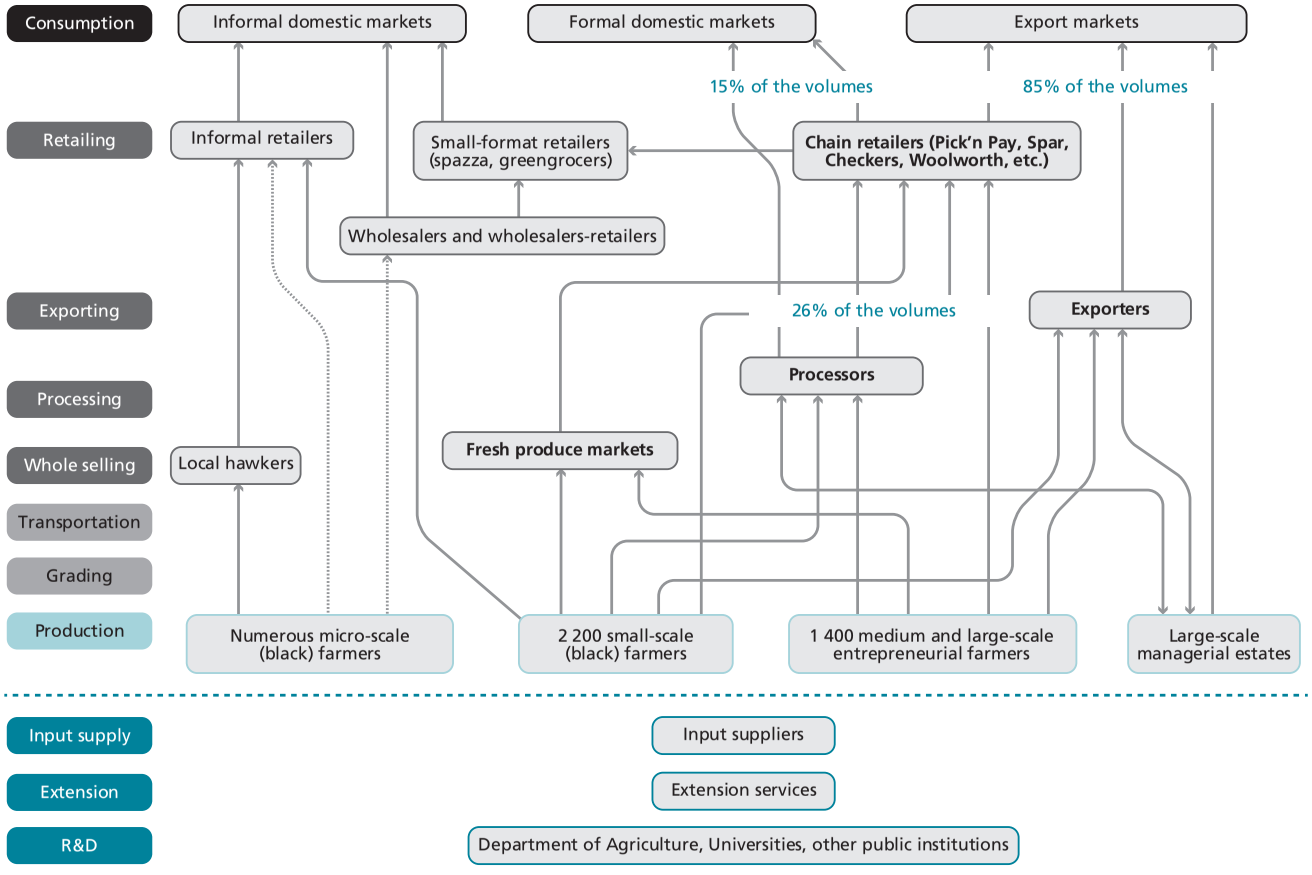
On the downstream side, the market environment has also changed. An oligopolistic structure has developed around a small number of dominant processors, packing houses and exporters (Figure 5.2) (Louw *et al.*, 2007; 2008). Directly related to the latter, as agribusinesses try to facilitate the adoption of their own specifications and reduce their transaction costs, they have chosen to work with a few preferred suppliers able to provide adequate and reliable volumes and qualities at specific times, and in order to ensure less fluctuation in prices. Subsequently, except for the informal market that tolerates small irregular volumes and variable quality, all major channels are subject to standards.

In theory, restructured markets present opportunities for smallholders to reduce transaction costs and increase their farm production and incomes. They could then benefit from these opportunities since they are constrained by historical imbalances in access to land and secure tenure regimes, input and output markets, infrastructures and quality control systems. However, because of the evolution of agriculture and markets, citrus growers face increasing competition and entry barriers, and have no choice but to comply with stringent standards in order to trade their fruit.

5.2 PATTERNS OF CITRUS CONTRACTS: FOCUS ON SMALLHOLDERS

Agribusinesses have utilized contracts for decades when procuring from smallholders from disadvantaged communities in "traditional" value chains such as tea, sugar cane, timber, tobacco and beverages (Kirsten and Sartorius, 2002; Porter and Phillips-Howard, 1997a; 1997b). The tendency within these sectors to organize procurement through these institutional arrangements was mainly related to commodity specificities, such as perishability, permanence of the crops, need for processing, etc. Lately, more directly related to the recent restructuring, linkages

FIGURE 5.2
The structure of the South African citrus sector



Source: authors, adapted from Madevu, Louw and Ndanga, 2009.

between agribusinesses and small farmers have also concerned a number of emerging sectors, such as poultry, other fruit and vegetables (Vermeulen, Kirsten and Sartorius, 2008).

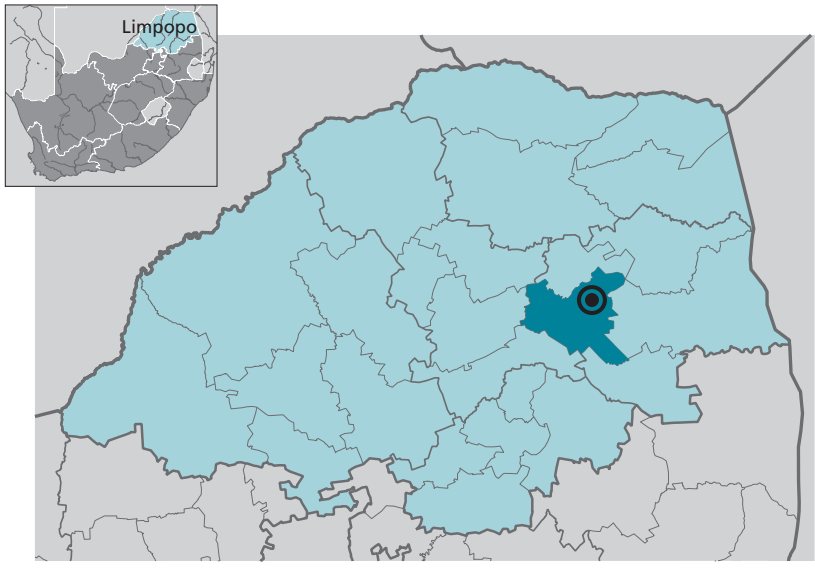
In the following section, two case studies from the South African citrus sector are presented. The first refers to a contract linking a private exporter with land reform beneficiaries; the second focuses on a leading juice processor engaged in a contract with a smallholders' organization. These examples are particularly relevant since the citrus sector, as mentioned before, offers new opportunities for small producers to reach well-developed and lucrative markets.

A case-study approach was applied for two reasons. First, these linkages are the result of recent initiatives and do not represent an overall and common tendency. However, they illustrate the nature of these emerging relationships, for both export and local markets and appear as pioneer initiatives that are given much attention from both the private and the public sectors. Second, contracts do vary. Detailing these case studies allows existing diversity to be covered, before endeavouring to draw generalizations and common factors related to the citrus sector in particular or to the agricultural sector in general.

5.2.1 Integrating land reform beneficiaries into citrus export markets

The first case study project takes place in Limpopo province (Figure 5.3). In the study area, located near the Letsitele settlement, two irrigation schemes are organized under two cooperatives. The Letsitele project consists of 62 smallholders who

FIGURE 5.3
Location of Letsitele in Limpopo province



Source: authors.

acquired 610 ha through land reform in the 1990s and produces citrus under a contract with a private exporter, with the remaining produce sold on the local market.

Background to the contract agreement

In the 1970s, two irrigation schemes were initiated by the Gazankulu Development Corporation, a parastatal that managed farm development in the former Gazankulu homeland to produce fruit (including citrus). Until the late 1990s, the schemes were organized as state farms and managed by the parastatal, which controlled production and trade of citrus.

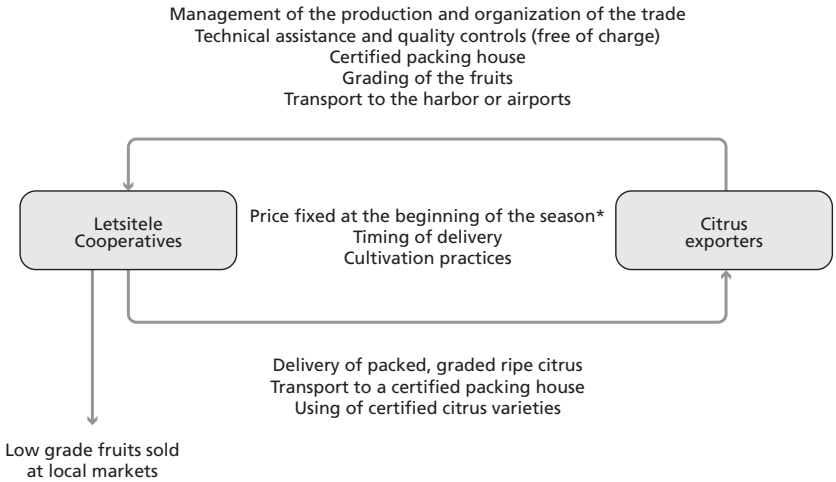
After the end of apartheid and after liberalization, the parastatal was disbanded, which left the smallholders stranded, both technically and financially. This coincided with the schemes being redistributed to local communities in the framework of land reform. In 1998, 62 of the former state farm workers accessed a 10–12 ha plot each. Because of poor management, lack of skills and insufficient funds for maintenance and infrastructure, the overall state of the schemes deteriorated. In 2001, the Limpopo provincial government intervened in the framework of post-settlement support for (failed) land reform projects. DAFF also approached a private company specialized in quality subtropical fruit trees and seedlings to provide assistance to the beneficiaries.

In 2001, under supervision and with support from DAFF, the farmers signed a memorandum of understanding (MoU) with the company, which decided to undertake the management of each cooperative as a single unit. For each "farm", a general manager oversaw production with the assistance of a production manager and section and scout managers. The appointees, some of the members of the cooperatives, were remunerated monthly, in addition to their profit share from sales. The farms employed together around 200 permanent workers, with another 300 people employed during the harvesting season.

The company and farmers mainly target export markets for their citrus. To comply with the high-value market standards, the company made funds available to the farmers in the form of unsecured loans and helped in getting alternative sources of capital, including a loan from the state-owned Development Bank of Southern Africa. A potential obstacle to access such loans was the nature of the guarantees required by the bank: either a substantial financial bond payable by the farmers, pledging the land lease agreement as collateral or personal guarantees by the members of the cooperatives. Neither of these were possible and consequently the company acted as a guarantor. Moreover, as the project was being considered a model pilot project in the framework of land reform programmes, the farmers received support from both public institutions and international donors,[10] which financed capacity building; scout courses; building of a certified packing house; and mechanical and financial management. In 2006, the production process complied with the requirements of GlobalG.A.P. and Nature's Choice certifications and, in 2008, with fairtrade.

[10] Including PPECB, the Limpopo Economic Development Enterprise, the Limpopo Business Support Agency, the United Kingdom's Department for International Development (DFID) (through its ComMARK programme) and the European Union (through its local economic development programme).

FIGURE 5.4
Terms of the contract linking cooperative members with the exporter



* based on a combination of preliminary tests, and on the conditions of the export markets, after deduction of the cost of transport to the harbor, packaging grading, and after reimbursement of the credit loans

Source: authors.

During the 2009/10 season, the MoU between the company and the cooperatives terminated, in accordance with the agreement to end the engagement once the project was well established. One of the citrus exporters decided to take on the management of the cooperatives, using the same model as that of the original company. Currently, this exporter trades 70 percent of all citrus produced to Europe, of which 80 percent complies with GlobalG.A.P., Nature's Choice and fairtrade certifications, the remainder being sold locally.

Contract characteristics

The core part of the contract is related to compliance with accreditation systems and mostly focuses on: (i) cultivation practices and the related resources and assistance; and (ii) handling, storage, packing and transportation conditions (Figure 5.4).

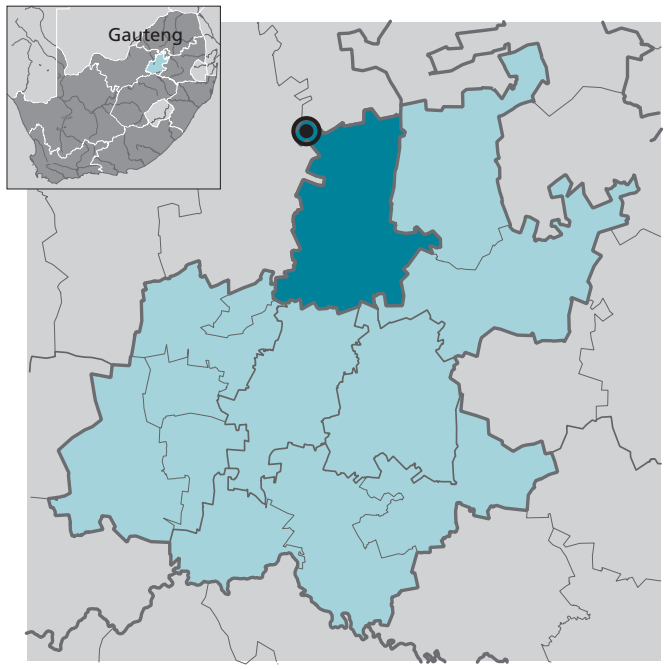
The contract stipulates guidelines in terms of cultivation practices, which are mandatory for certifications, in particular for types of inputs to be used. The exporter's experts frequently visit the farmers, free of charge, to monitor the practices, as well as to assist them technically. Depending on production needs (according to production stipulations) as well as the ability of the grower to pay back, the exporter extends credit to farmers.[11]

[11] Credit at an interest rate of 12.5 percent, payable at the end of the season.

According to the contract, farmers are compelled to deliver all first- and second-grade fruit to the exporter. All consignments delivered that satisfy these grades are bought. Farmers transport the fruit from the orchards to certified packing houses with their own means. The exporter is certified and requires specific transportation conditions from orchards to packing houses and then, once packaged, to a port cold storage facility by rail or truck, before the cooled fruit is exported by ship or airfreight. To comply with standards, it is of the utmost importance for the exporter to be able to track the fruit during every link of the value chain.[12]

The contract is not clear on issues of failure and conflicts; however, farmers indicated that the exporter can reject fruit delivered that does not meet requirements and has the prerogative to terminate the contract, if farmers do not comply with the stipulated cultivation practices.

FIGURE 5.5
Location of Winterveldt, Gauteng



Source: authors.

[12] The APS act specifies that, for traceability purposes, food business operators should keep adequate records that allow them to identify the suppliers of ingredients and food products used in their operations, as well as food businesses supplied with products.

5.2.2 Inserting small farmers in the juice processing industry

The second case study occurs in Winterveldt (Gauteng), one of the largest areas of black settlement in the former Bophuthatswana homeland (Figure 5.5). It is a unique case as, already back in the 1940s, the land was subdivided into 5- to 10-ha plots and sold to black farmers on a freehold basis. In 2002, a group of plot owners established the Winterveldt United Farmers' Association (WUFA). It currently has 145 members who have been engaged in a contract with a local citrus processor since 2007.

Background of the contract agreement

WUFA was created in 1967 by two well-known local leaders, a Reverend and an agricultural scientist, who was also the President of the National African Federated Chamber of Commerce and Industry (NAFCOC) for 25 years. However, at that time, agriculture in the region faced major constraints (displacement and resettlement of nearly two million labourers into the area as a result of forced policies, inauguration of several border industries and mines within a 20-km radius) that contributed to the decreasing interest of local people in this activity and to WUFA remaining inactive for 30 years.

It was only in 2002, when one of the founding leaders of the producers' organization used his retirement package, network and knowledge of citrus to revitalize agriculture in Winterveldt, that WUFA effectively started its activities. It initiated the Winterveldt Citrus Project, a membership-based association that managed to mobilize funds from various donors. These included DAFF (Comprehensive Agricultural Support Programme and Agricultural Business Chamber Cooperative Development Initiative); Tshwane Metropolitan Municipality; National Development Agency; Tshwane University of Technology; Promotion of Agribusiness Linkages Training and Technical Assistance Funds; a local supermarket; and other private donations from a neighbouring community. Most of the funding helped the smallholders to engage in citrus production: de-bushing of the area; purchase of a borehole irrigation system, fencing, machinery for packaging and farm equipment; and construction of a packing house. Other initiatives provided administrative support and technical and business training.

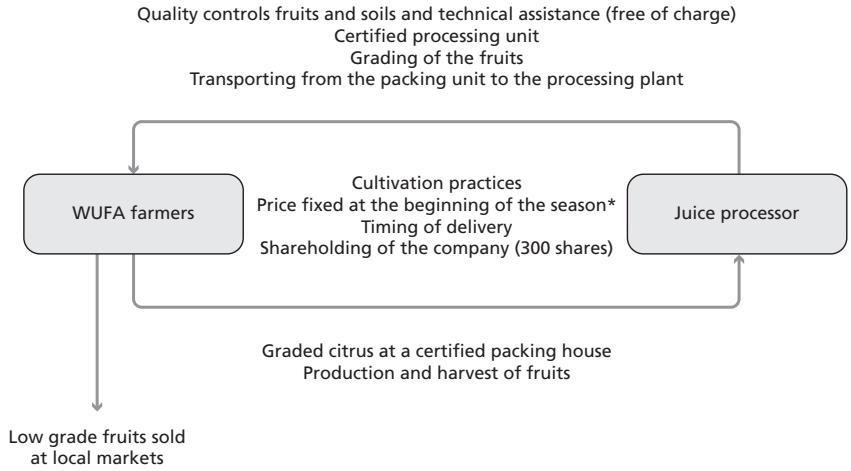
In 2003, the leader of WUFA convinced an old acquaintance from his NAFCO presidential days to have his juice processing firm supplied by the local black smallholders. Later that year, this processor started providing technical assistance to the project and, in 2007, it even granted black equity ownership, resulting in the company being classified as AgriBEE and allowing it to benefit from affirmative action incentives related to the Broad-Based Black Economic Empowerment (B-BBEE) policy framework. Small (black) farmers thus became shareholders and henceforth participated in the governance and executive control of the processor.

Contract characteristics

Based on a one-year renewable formal agreement, the contract mainly deals with issues related to cultivation practices, technical assistance, modalities of the deliveries (timing) and payment according to quality specifications (Figure 5.6).

The processor adheres to various certifications (good manufacturing practice [GMP], HACCP, ISO 9001). As standards are not as strict for processing as for

FIGURE 5.6
Terms of the contracts linking WUFA farmers with the processor



* based on a combination of preliminary tests

Source: authors.

exports, the terms of the contract only rely on production stipulations (inputs to be applied according to a related calendar). The processor engages in providing assistance through regular visits from experts and quality controls of produce and soils. The processor does not provide any resources to farmers. On their side, as shareholders, farmers deliver a certain quantity of ripe fruits at a fixed price. Quantity, quality and prices are determined through samples tested by experts from the processor. The contract and the payment are held at WUFA level, while farmers are paid *pro rata* to their deliveries, which are recorded by WUFA.

Since 2007, farmers harvest on average 1 000 tonnes of citrus a year from 70 000 trees, of which 30 percent are sold to the processor, the remainder being traded either to a local retailer or to informal markets in the settlement. Farmers are looking into the possibility of accessing high-quality fairtrade export markets under their "Bosele" brand.

5.2.3 Assessment of effectiveness of contract arrangements

The evolution related to the liberalized, oligopolistic, export-oriented and standard-dependent citrus sector in South Africa, makes it almost obligatory for (small) citrus growers to comply to production and market stipulations and, thus, to develop agribusiness/smallholder linkages. The following section examines how contracts have enabled smallholders to integrate into modern market channels by alleviating (or otherwise) their constraints, therefore questioning their effectiveness.

Enhancement of production capacity – empowerment, access to resources and capital

In a context where high-value crops necessitate input levels exceeding the financial resources of smallholder growers, and where the state has withdrawn from direct support, contract agriculture can play an important role in smallholders' empowerment, and their access to resources, services and capital. In many cases, smallholders are unable to fulfil by their own means the costly requirements for producing under standards. As such, contracts can enable smallholders to access modern markets in several ways.

First, contracts can enable smallholders to access quality seedlings and adequate inputs, to be able to provide sufficient varieties and quality fruit. Although farmers often have to pay for these inputs, with costs being deducted from the final payment, contracts enable them to access the appropriate inputs at the right moment and, thus, to comply with the stipulations required by the standards and certification procedures. Second, contracts can help smallholders to access funds, through direct provision of loans from agribusinesses or their guarantees to banks. Third, contracts can enable smallholders to benefit from quality services. In most contracts, frequent quality and often free technical and even financial and administrative assistance is provided by agribusinesses. Lastly, contracts may involve capacity building and skills transfer.

In short, contracts enable smallholders to produce according to the required quantity and quality and can be considered positive instruments where there is a lack or insufficiency of public support, a constraint clearly faced by smallholders.

Market access – enabling to compete with large growers

Besides empowerment at production level, contracts directly facilitate market access. This is of particular importance in South Africa where market (non-)access represented a tool of apartheid's segregation policies. However, in addition to the emergence of standards, market restructuring kept the large majority of doors closed to new entrants: in many cases, public entities were privatized through the transfer of state ownership into private shares, mainly controlled by the then well-established larger-scale, and thus white, commercial farmers (Anseeuw, 2004). Not only do contracts now enhance smallholders' production bases in volume and quality (meaning they can compete with other farmers), but they also open up market channel doors. In some cases, smallholders may even be empowered as shareholders and participate (although partly) in governance and executive control of the firms, transforming their position from "market users" to "market makers".

In addition, high-value produce not only needs to meet private standards in terms of cultivation techniques. It also has to be handled after harvest following strict procedures to ensure high quality along the value chain. Agribusinesses have a superior ability in terms of post-harvest handling, infrastructure, storage, and transportation access and management. Again, contracts can help smallholders to overcome complex logistics issues regarding transportation from the orchards to the packing houses and/or processing units, and to the harbour or the airport when products are exported. Labelling and traceability requirements, two major concerns in modern markets, are organized by the agribusinesses, which largely explains exporters' strict control over post-harvest handling and transportation. The final

delivery to international markets is arranged by exporters – the only ones licensed for exportation by the national authorities. Exporters recoup their costs by deducting the requisite charges from the gross amounts prior to paying farmers.

Transferring control and decision rights over production and resources

Depending on the degree of integration (and thus of risk sharing), contract farming is characterized by the transfer of decision rights. From the agribusiness point of view, this transfer offers them an opportunity to expand their activities, to access resources and manage production at the farm level, directly or indirectly. It results in them having major control over production, as the contract takes most decision rights and risks away from farmers. In many cases, smallholders lose control over the broader production-related decision processes. They are thus incorporated within production chains, in which they represent only an isolated element and where they have no orientation power. Generally, the technical capital used does not belong to them, but is made available by the management company, which not only creates a subordinated position but also develops a dependency situation, since smallholders are unable to withdraw from these relations without losing access to the necessary finance and input. The transfer of autonomous family farms into the integration within an entrepreneurial structure necessarily modifies the relations with the agricultural activity *per se* (Anseeuw *et al.*, 2011).

This situation highlights the need to interrogate fully the expectations, interests and motivations of the actors involved, and to question the sustainability of contracts, economically, politically and socially, as well as the relevance of the "empowerment" process.

Concerning only a few, often already better established farmers

It has to be said that contract farming tends to concern only a small proportion of farmers, especially when smallholders are considered. This observation lowers the efficiency of contracts as a broad-based tool for market integration (Table 5.1).

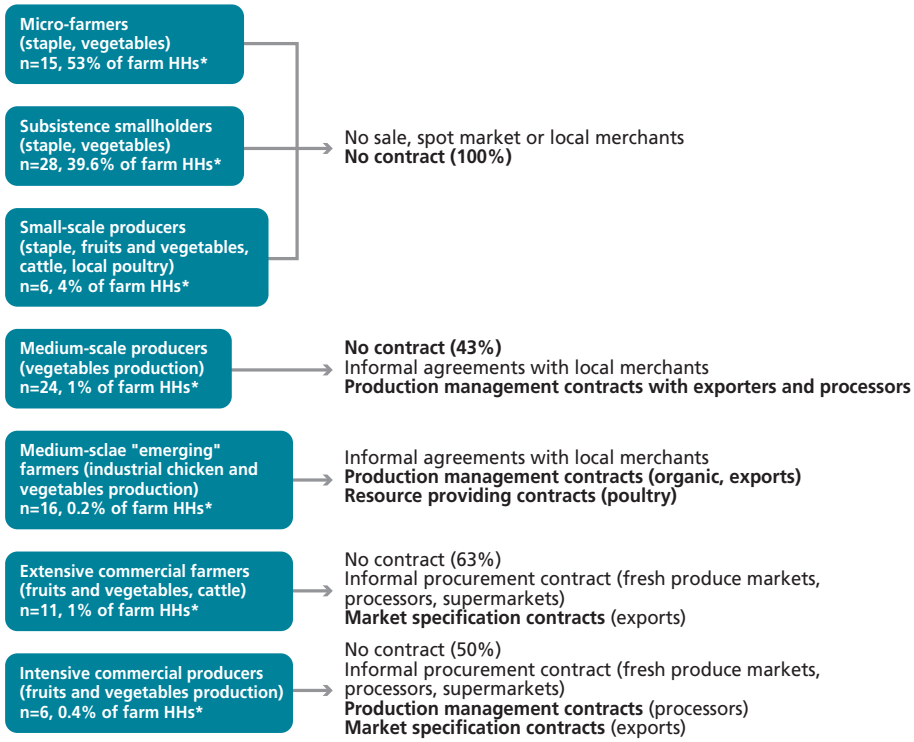
Quantifying the scale of contract agriculture, whatever the level of analysis, is difficult. Whereas some authors attempt to estimate the scope of its development in Africa (Grosh, 1994; Little and Watts, 1994), most studies in this respect focus on its impact at farm level (Bellemare, 2010; Maertens and Swinnen, 2009). In a recent study, Vermeulen, Kirsten and Sartorius (2008) estimate that almost 80 percent of the volume of fruit and vegetables transformed by the South African processing industry

TABLE 5.1
Extent of contracts in South Africa for selected commodities

Subsector	No. of contract farmers	No. of contract smallholders
Sugar cane	16 045	14 830
Timber	50 000	15 000
Cotton	3 000	–
Fresh fruit and vegetables	3 430	278

Source: authors' compilation.

FIGURE 5.7
Types of farm households and participation in markets in Limpopo



* Notes: number of detailed questionnaires to a random group of respondents allowing for the capturing of the diversity in household types. Based on the results of the 239 short interviews conducted and being representative of the population in the study area.

Source: Fréguin-Gresh, D'Haese and Anseuuw, 2013.

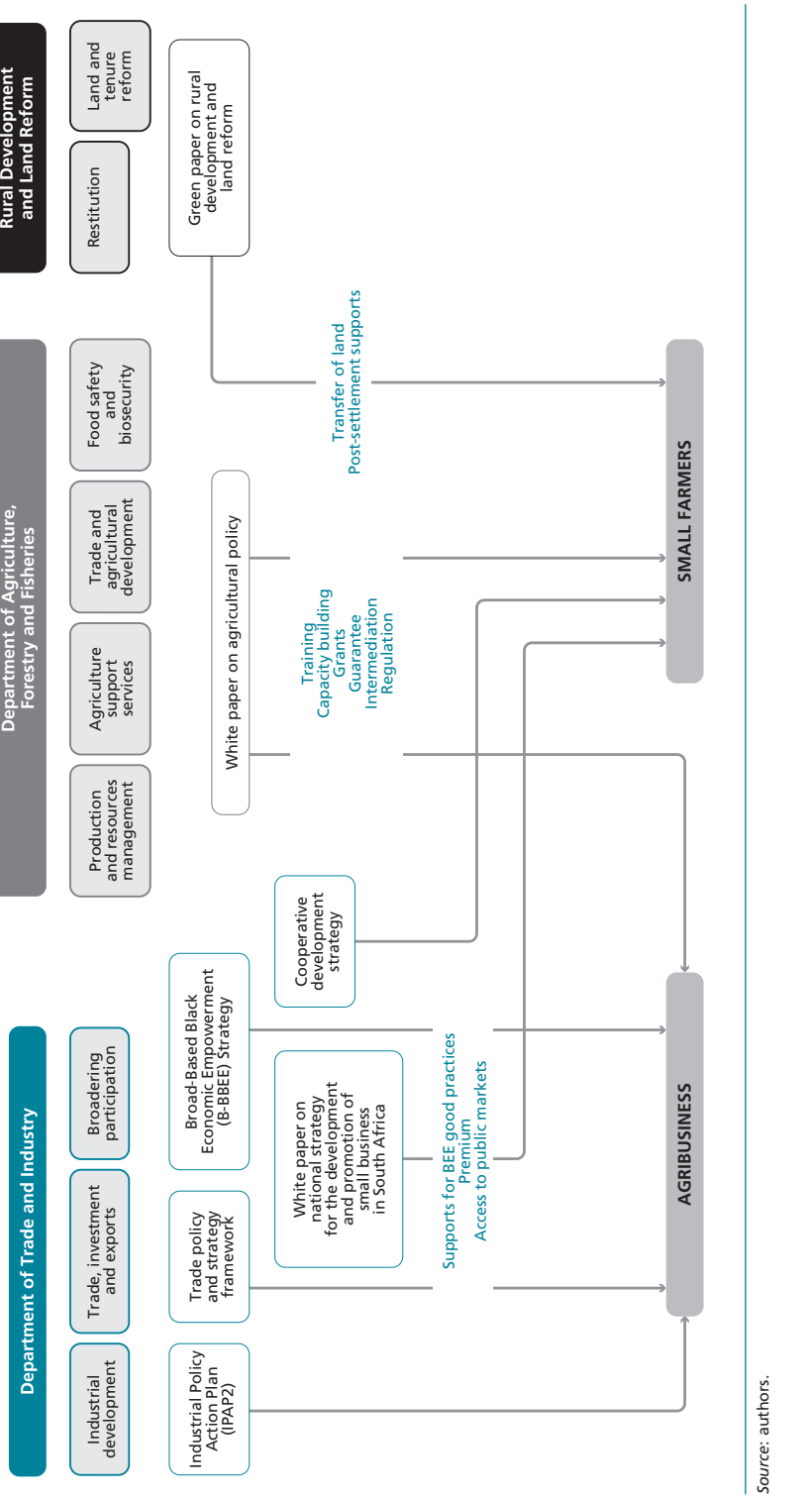
(21 percent of production) and between 70 and 100 percent of products sold in supermarkets were supplied under contract, but only 5 percent involved smallholders.

Consequently, compared with the existing 40 000 commercial farm units and 1.2 million small farms (DAFF, 2010), only 8 percent of South Africa's farmers and 2.5 percent of smallholders are engaged in contract farming. In addition, similar analyses by Fréguin-Gresh *et al.* (forthcoming show that only certain types of farmers, i.e. the already better off and better integrated ones, are engaged in contracts. The large majority is being excluded (Figure 5.7).

5.2.4 External factors that affect the likelihood of establishing and sustaining contracts

The literature details internal factors affecting the establishment and sustainability of contracts. They are related to the product (characteristics, market trade-on, nature and need of processing) and the processing (asset specificities, uncertainty, difficulty

FIGURE 5.8
The current institutional environment of contract agriculture in South Africa



Source: authors.

of measuring performance in fulfilling the terms of an agreed transaction, need for coordination with other transactions with other actors) (Bijman, 2008; Eaton, Meijerink and Bijman, 2008). However, external factors do also play a significant role in establishing and sustaining contracts.

The two case studies presented earlier show, however, that several external factors also do play a significant role in establishing contracts between small farmers and agribusinesses. The paramount factor is related to public support. Without this support, it seems unlikely for South African small farmers to engage in contracts with agribusinesses. Other factors – some of them directly or indirectly related to the previous one – are (i) the historical legacies and the agrarian structure conditioning the means and production factors available to farmers; (ii) the capacity of the initiator of the linkage to screen up and establish/mobilize a network; (iii) collective action; and finally (iv) multistakeholders' initiatives and private voluntary standards.

Public incentives enabling contract implementation process

Although the role of the state has officially decreased in the past decades, as described in the first section and as illustrated by the restructurings of the citrus sector, public action is still strongly influencing the agricultural/citrus sector overall, and therefore the market linkages between small farmers and agribusinesses in particular. Figure 5.8 details the large number and the different types of public initiatives directly or indirectly supporting contract farming, during the implementation phase leading to contract agriculture and/or after the contract has been drawn up.

From the farmer's side, the government intervenes directly in the provision of production factors, mainly during the establishment phase (in its framework of support to previously disadvantaged farmers). This is particularly true in the citrus sector where most smallholder growers are land reform beneficiaries. Of 68 citrus farms incorporating smallholder growers documented by the CGA, 21 percent are producing on state land that has been redistributed or relocated to local communities, 18 percent are engaged in equity shares or joint venture models (i.e. private farm with capital sold to former farm workers through land reform), 12 percent are on lands owned by the Land Bank, and only 3 percent are on private freehold land tenure. In addition, small farmers engaging in contracts also accessed public funding and loans from institutions such as the Land Bank, through microfinance programmes (MAFISA for land reform beneficiaries, but also other programmes for black farmers implemented by the National and Provincial DAFF), or the Comprehensive Agricultural Support Programme (CASP), which provides grants for infrastructural development during the settlement phase. Furthermore, farmers can also take advantage of technical support and capacity building facilities. As such, they can benefit from the industry-focused farmers' training programmes, the training of black farmers in agricultural marketing programmes, and programmes to strengthen compliance and implement national regulations to ensure compliance with plant and animal health, biosafety and biosecurity regulations, and the effective regulation of agrochemicals. This public support fulfils the government's social, economic and political objectives to promote the previously disadvantaged farmers, even though the system and the institutions providing them are often riddled with recurrent failures and have been severely criticized for not carrying out these operations with sufficient technical and primary institutional systems.

On the other hand, for competitive agribusinesses, although contracting smallholder farmers is potentially very risky, they do benefit from incentives from public institutions. The most prominent policy encouraging linkages between agribusinesses and black farmers is the agricultural component (AgriBEE) of the Black Economic Empowerment (BEE) policy, an affirmative action policy. Based on a scorecard, businesses classified as BEE benefit from subsidies – used as incentives by the state to promote inclusiveness. Within the framework of this study, one AgriBEE recognized activity is the procurement of agricultural goods from black farmers, within the broader engagement of the agribusiness in rural development. Other components are black ownership, management and control within the agribusiness, employment equity, skills development and corporate social investment. From interviews with agribusinesses in the two case study regions, it appears that the AgriBEE policy and benefits represent a major – even *the* major – incentive for agribusinesses to enter into contracts with small farmers. In addition, this is generally promoted by the companies as part of their corporate social responsibility duties and used as fairtrade promotional marketing.

With regard to the links between farmers and agribusinesses, the government also intervenes significantly. These interactions occur in both direction: the government often initiates the contacts between the two partners, by bringing in the agribusiness (Letsitele project) or initial contacts between farmers and agribusinesses might initiate further public support – enabling a public-private virtuous circle (Winterveldt's case study). In both cases, besides direct (financial) support, the government engages in the negotiation, establishment and monitoring of the contractual arrangements. It can also intervene as mediator when conflicts or contract breaches occur. Other policies assist the contract formation and ensure standards. For instance, the trade and agricultural development policy, and the biosafety and biosecurity policies promote strategic partnerships/mentorships between smallholders and large-scale farmers. Moreover, the Cooperative Development Initiative encourages farmers to form cooperatives, making it easier for them and the agribusiness to engage.

Since the country's agricultural sector is deregulated, South Africa is encouraging small farmer integration through the already well-established and competitive commercial agricultural and agribusiness sector. It is believed that this is the way forward to promote small farmers into commercial farmers. However, contrary to what the deregulation process of the agricultural sector might imply, the state is still extremely present and active in the support of agriculture, particularly regarding support for smallholders. Nonetheless, the model bears with it several questions. On one hand, the financial sustainability of such a development model is yet to be seen, while on the other, the ability to replicate it in other African and developing countries is certainly to be questioned.

5.2.5 Historical "legacies" and agrarian structures

Besides the agro-ecological and technical aspects directly related to the production and marketing facets, South Africa's legacy influencing institutional, political, historical and socio-economic factors related to its rural transformation influences contract farming. Analysing the agrarian structure – i.e. farming practices and their relations to the asset endowment, capital and farm households' development paths

– is essential to understand the modalities, opportunities and limitations of contracts between agribusinesses and farmers.

The two case studies and a broader analysis of the changes within the citrus sector confirm the permanence of the huge duality of agrarian structures in South Africa. This situation reflects historical "legacies" in terms of past policies, level of past and current public incentives, and concentration of asset endowment and thus of bargaining power, which have strongly and deeply influenced farmers' development paths. This structural duality remains determinant in the ability of farmers to respond to modern markets' requirements and, consequently, their possibility to engage in contracts. On the one hand, the differences in scale of production and trade across the South African farms imply huge competition discrepancies between farmers, negatively affecting the smaller ones. On the other hand, these divergences in production scale and trade lead to biased power relations between smallholder farmers and agribusinesses, resulting in disadvantaged bargaining positions for the latter (D'Haese and Van Huylenbroeck, 2005).

The structural duality of South African agriculture presents a substantial risk of marginalization. This is particularly the case within the highly competitive citrus sector and the modernized South African agricultural markets overall. This evolution and the development of linkage between small farmers and agribusinesses could be decisive for the development of the sector and agricultural restructuring.

5.2.6 Networks

The two case studies show that the likelihood to establish contracts is strongly influenced by the networks of the initiator of the linkage. In both case studies, relationships existed either with private agribusinesses (Winterveldt) or with a public body responsible for agriculture and rural development (Letsitele).

The private sector has proved that it can more easily establish linkages with farmers as it generally has access to more precise information and is more able to screen and identify their future partners carefully – a key success factor of contracts (Porter and Phillips-Howard, 1997a; 1997b, among others). This being said, it seems that these linkages are facilitated by the farmers' existing networks, allowing them to take the lead in approaching agribusinesses or government. The latter would partly enable them to proof voluntary engagement and to influence contractual arrangements. However, individual small farmers are rarely able to initiate contracts, as was the case in the Winterveldt citrus project where the farmers' organization leader could link up with the agribusiness through his exceptional social and business networks. Farmers, in particular the smaller ones, are often limited in terms of social capital and networks.

5.2.7 Collective action

Often related to the capacity of farmers to establish networks, collective action is essential. The existence of farmers' organizations usually facilitates the implementation and the sustainability of contracts engaging smallholders (Runsten and Key, 1996; Eaton, Meijerink and Bijman, 2008; among others). It is clearly a common aspect of the case studies previously presented: contracts were signed at farmers' organization level.

As mentioned by FAO (2004), farmers' organizations are beneficial to commercialization of farm products and agribusinesses' development. Farmers as individuals, particularly smallholders, are at the weak end of the economic exchange system. They therefore have to evolve strategies to enhance their market power. Farmers' associations can be responsible for configuring its members with market requirements including training, extension, technology acquisition, provision of commodity inputs and coordinating harvest delivery schedules. Agribusinesses on the other hand can deal more efficiently with farmers' organizations by acquiring representation in the management structure, as well as allowing the producers' association to be represented in its own management structure. The agribusiness companies, moreover, can further influence the efficiency of the farmers' association by ensuring it maintains records, has no political agenda, is limited in size and that it contains sufficient professional management.

Our interviews with agribusinesses emphasized, however, the difficulties related to dealing with farmers' and producers' organizations. The establishment of these cooperatives is often implemented from outside (often in the framework of land reform or specific government support programmes); the latter lack genuine common principles and effective collective action (Ortmann and King, 2006). Several agribusinesses said that they would not to be willing to work through such organizations further and would prefer individual, agribusiness-to-farmer procurement routes. However, such practices limit the possibilities for smallholders, as they will never be able to attain the required thresholds. Support regarding collective action is thus crucial.

5.2.8 Multistakeholder initiatives and private voluntary standards

Institutional facilitation by international NGOs, donors, and other stakeholders has assisted in establishing linkages between small farmers and agribusinesses. Although such types of engagements are not extensively developed in South Africa, they do appear in particular related to export markets.

This is particularly the case with fairtrade certification, engaging numerous land-reform citrus projects in South Africa (Ikegami, 2008). Although the genuine character of such certification models is sometimes questioned (Fouilleux, 2010), engaged producers can be represented and supported on issues related to standards and market access – delivering technical support, campaigning for new prices, revision of existing standards or making the standards more relevant to local farming practices. These certification initiatives also provide an effective platform to coordinate and communicate among certified producers.

5.3 CONCLUSIONS AND RECOMMENDATIONS

The analysis of contract patterns emphasizes some encouraging results from the smallholders' perspective. They improve agricultural production, access to services (training, capacity building, technical assistance, etc.), access to resources (production factors, inputs, credit, information) and the development of new opportunities to participate in competitive markets subject to strict standards.

Nevertheless, the study also provides counter arguments, emphasizing that contract farming is not a panacea in all situations, particularly concerning smallholders. The current number of smallholders involved in contracts remains limited

(in absolute numbers and in comparison with the number of large-scale farmers contracted). Contracted smallholders are already better off or have benefited from significant public support, leading one to question the effectiveness of contract farming as an instrument for market inclusion overall, for resource-poor farmers in particular. The transfer of production management and decision-making processes to agribusinesses leads to the need to examine fully the expectations, interests and motivations of the stakeholders, and question the economic, social and political viability of contract farming for sustainable and equitable relationships and for mutual benefits. The increasing role of standards in the governance of value chains progressively drives contractualization and pushes towards more fully vertical integration that often leads to the exclusion of independent farmers. Lastly, there is the necessary role of public support, defying the core utility of contract farming and questioning its financial feasibility. These observations lead to several recommendations.

First, an assessment of the different stakeholders (agribusinesses, farmers) is necessary. What are their expectations and motivations to engage in contracts? Whether and how can contracts participate in the resolution of their challenges? Indeed, in South Africa, the majority of smallholders evolve in a context of social dependence and exclusion of productive income-generating agriculture, in particular in the former homelands where agrarian history based on exclusion, inequality and "de-agriculturalization" has resulted in the loss of agricultural identity and the destruction of agrarian, socio-economic development paths for the vast majority of the rural population (Eastwood, Kirsten and Lipton, 2006). Considering the broader South African context and that of other developing countries and the many deep-rooted problems smallholders are facing, overcoming the challenges of their market integration imposes a broader transformation of farm structures. This will allow them to become – along a continuum of improvement – integrated into value chains through which they can meet the demands of consumers and agribusinesses on a sustainable basis. However, this does not mean that targeted efforts to promote the development of contract farming must be ignored, particularly for niche markets and very demanding export markets where smallholders' farming systems, through the use of family labour and flexible production reorientations, might seem more appropriate.

Second, over the last two decades, agribusinesses have oriented their sourcing strategies according to available volumes and favoured procurement from large-scale producers or from their own estates. As a response to the emergence of private governance at present exceeding traditional market logics, the current trend is characterized by a reversal based on quality, traceability and on niche suppliers. Although representing an opportunity for smallholders, Sautier *et al.* (2008) argue that the related trends of bypassing traditional markets and direct procurement from farmers have led to the exclusion of smallholders. Yet the social and political imperatives in South Africa result in increasing room for manoeuvre, openness and commitment to procure from smallholders. As such, characterized by high level of labour productivity and high care advantages, they are able to gain market shares in that environment, if they are correctly supported and accompanied in order to overcome initial inequalities. This chapter demonstrates the feasibility of creating, in South Africa, a virtuous circle combining public policy and private investments.

Such supports to smallholders should engage both government and the private sector, and must be addressed in a rationale of production and market regulations that can target and help smallholders in a context of economic liberalization and withdrawal of the state.

Third, contracts engaging farmers with agribusinesses should remain flexible. Analyses show that frequent and open contacts, based on mutual trust, respect and benefits, with payments upon delivery, and a regular monitoring and quality support, are the key towards "success", particularly when engaging smallholders who are often confronted by uncertainties. However, oral agreements can also raise problems regarding the interpretation of parties' duties and responsibilities, in particular when smallholders are not well equipped in terms of human capital and education.

Fourth, contracts should lead to long-term, sustainable "win-win" linkages based on equitable principles: they should promote production, market access and contribute to increased farm income for smallholders, while at the same time, providing for reasonable returns to agribusinesses. From the smallholders' standpoint, this situation involves a long-term incremental process of coaching, with an implementation involving capacity building, technical, and institutional coordination and – finally – of ownership. Contracts solely based on a "business plan" to generate profits and short-term profitability are rarely successful or appropriate.

Finally, dialogue is important for the sustainability of contracts to avoid misunderstandings, confrontation and conflicts. Consequently, careful and in-depth discussions engaging all the stakeholders (farmers, the state, agribusinesses, producers' organizations, NGOs, etc.) must be conducted. Active producers' organizations, the state, as well as civil society, are important facilitators to develop sustainable relationships. In this context, local NGOs have shown interesting results in projects involving smallholders in terms of provision of training, technical assistance and negotiations. However, it is important to define the roles of each party. Civil society can influence and facilitate the process of negotiation during the initial stage of the establishment of a contract or, in case of failure, it can behave as a third party mediation or arbitration actor, but it should not be directly involved in the contract itself, since this could create conflicts of interests. One possible solution could be the establishment of platforms and/or interprofessional organizations, as found in some sectors such as the South African sugar-cane industry. Such types of arenas could offer opportunities to small farmers to influence the nature of linkages, taking into account the views and the constraints of each stakeholder.

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Chapter 6

Contract farming to access lucrative markets: Small-scale vegetable producers in the United Republic of Tanzania

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6.1 INTRODUCTION AND BACKGROUND

Small-scale vegetable farmers in the Arumeru district in the northeastern part of the United Republic of Tanzania traditionally produce at subsistence level, with limited excess production sold at local markets. Despite favourable production conditions such as fertile soils and abundant irrigation water, the small farm sizes and lack of capital to access technologies such as improved seeds and fertilizers, make it difficult for farmers to increase yields and transport products to urban or regional markets where they could earn higher incomes (Hillbom, 2011). At the same time, commercial farmers operating in the area also face diseconomies of scale because of their small landholdings, which prevent the accumulation of sufficient volume and quality of product to gain access to more lucrative markets either within the region or internationally. Consequently, farmers supplying the local district markets flood the market with similar products at the same time each year, driving prices down and earning low returns. In addition, they have little incentive to improve quality because of low consumer requirements and/or scarce possibility to pay for higher-quality products.

Against this backdrop, the privately owned medium-size farm estate known as "Meru", located in the vicinity of Mount Meru, northeastern Tanzania, started operations in the 1990s to concentrate on vegetable production for export. The estate owned approximately 160 ha of land, and was driven by the potential for significant returns from accessing European markets. Operations at Meru were accredited according to the standards of EurepGAP[13] and the range of export crops produced included beans, peas, chilli, okra, leeks and baby corn. In order to maintain control

[13] EurepGAP has been called GlobalG.A.P. since 2007.

over product quality, the Meru estate built a centralized vegetable packing station on the farm where collecting, sorting, grading, trimming and packing of vegetables for export could be carried out. This operation was registered as a separate legal entity, known as Meru Packing & Export (Meru). Once packaged, vegetables were labelled in accordance with requirements for final European markets, and were transported to the three international airports within reach: Dar es Salaam, Kilimanjaro International and Nairobi International Airport across the border in Kenya. The vision of Meru was to produce the highest quality products for export markets.

This vision was mostly achieved because of the favourable natural environment for vegetable production (fertile soil and year-round irrigation) and the experienced farm management staff. For the sake of delivering consistent first-grade quality for export, Meru took into account that 30–45 percent of waste/losses had to be accepted. These wastes were channelled to the estate piggery to be utilized as animal feed. However, in order to expand its business and increase earnings, Meru needed access to additional land for cultivation, and also needed to hire more farm labourers to expand the area under production. The degree of mechanization for horticulture is very low because of the sensitivity of the edible parts to mechanical damage, so virtually all the horticultural work has to be carried out manually. Thus, Meru was faced with two major challenges.

- *Additional land was difficult to obtain.* Land use and land allocation were managed via the district governor and/or the local village chief, depending on the colonial history of the land. Moreover, Meru is an area with a high population density – on average, more than 1 000 people/km^2, compared with the national average of 41 people (Larsson, 2001), thus land is scarce.
- *Additional labour was hard to find*. People living in the surrounding areas provided family labour to support subsistence agriculture.

In 2004, in order to overcome these challenges, Meru decided to engage in a nucleus estate contracting model as described by FAO (2001). In addition to operating its own farm, the estate began contracting commercial farmers, i.e. those with 2–20 ha of land already producing and supplying vegetables to the domestic market, to produce beans and various types of peas for export. To incorporate surrounding land further into the production process and gain access to additional labour, Meru also sought to involve what were previously considered to be subsistence farming communities. It achieved this goal by forming horticultural cooperatives known as Market Intermediary Cooperatives (MICs), which supported farmers to produce according to Meru's technical specifications and quality requirements laid down in contracts.

Hundreds of smallholders in the surrounding areas were attracted by the option of upgrading their small-scale vegetable production operations and agreed to accept and follow specific instructions as dictated by the contracts. This involved producing new varieties of vegetables, according to a specific time schedule and leaving the marketing to Meru Packing & Export, acting as the Produce Marketing Organization (PMO). After much deliberation with the local authorities and the elders in the areas surrounding the estate, it was decided that the MICs would be created in the villages since they act as the administrative division for smallholders who primarily cultivate plots surrounding their homes (Hillbom, 2011).

The MICs were formed along tribal lines and each MIC had no more than 200 members. A manager was seconded to each MIC from the Meru estate to assist farmers with implementing the standards required according to EurepGAP. In total, approximately 220 ha were united under the one contract scheme at any given time. Because of the intense disease pressure associated with vegetable cropping, and in accordance with EurepGAP rules, a strict crop rotation schedule was followed whereby no more than 25 percent of the land could be used at any one time. Thus the total land area involved in the contracting system was approximately 1 000 ha, which included the 160 ha of Meru estate land; the land contributed by the commercial and emerging commercial farmers; and the small parcels of land under contract through the MICs, which represented approximately 1 700 subsistence farmers and a production area of approximately 25 ha of active land. Contracting of commercial farmers began in early 2005 and of subsistence farmers towards the end of the same year.

The contracting model required the collaboration of independent commercial farmers, emerging commercial farmers and MICs to work together with Meru Packing & Export (i.e. vertical coordination), in order to achieve the matching of supply and demand between different stages of the supply chain, e.g. producers, traders, processors and retailers as discussed by Minot (2011).

Meru effectively took over the farm management role, from selection of varieties and the provision of inputs, to providing detailed technical support and monitoring throughout the production process. In return, it paid competitive prices to farmers for grade one vegetables after sorting. The contracting mechanism successfully linked small farmers with European markets (albeit indirectly), as frequently described in the contract farming (CF) literature (da Silva, 2005). The provision of necessary inputs and expertise through ongoing extension advice, and a transparent grading and pricing system, when combined with professional receiving, sorting, cleaning, packing and shipping of produce, formed a bilateral win-win situation for both contracting partners. At least initially from the production perspective, the partnership was a success. However, for reasons that will be discussed later in this chapter, the CF operations were ultimately unsustainable because of the poor financial and operational management skills of the contracting firm and an inability to manage its relationships with demanding downstream customers.

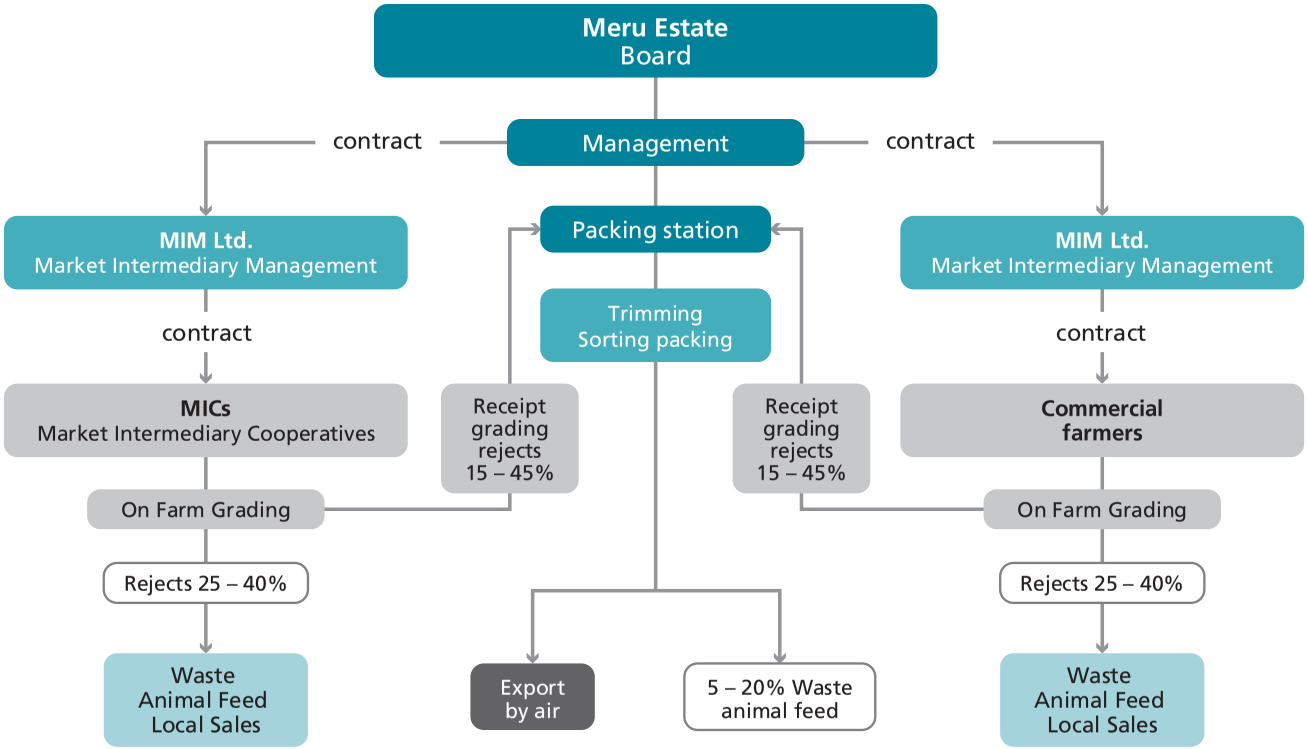
6.2 CONTRACT AGREEMENTS

6.2.1 Description of partners and experience with contracting

In order to achieve the objective of increased volumes of vegetables for export that met EurepGAP quality standards and thus greater returns from sales, Meru redesigned the organization of its overall business model. The enterprise changed from a simple, vertically integrated farming, packing and export business that utilized its own staff and retained complete control over the production and marketing process, to a more open and complex structure that included several new entities and players. In particular, it included small-scale commercial farmers and emerging commercial farmers; and MICs that pooled together many small subsistence farmers into production clubs or sub-units to cultivate the same crops in a defined production area.

Figure 6.1 shows the complex new structure adopted by Meru in its contracting operations.

FIGURE 6.1
Participants in and structure of the contracting company



Source: compiled by Ohlde and Rüsch.

The relationships identified in this scheme are akin to those of the multipartite contract model described by FAO (2001).

Contract farming was identified as the long-term sustainable solution for the required growth of the company. Through the introduction of a contracting scheme, Meru hoped to achieve the following outcomes:

- increased supply of certified high-quality products to Meru for export to the EU;
- increased production area to implement crop rotation and integrated pest management (IPM) criteria as per EurepGAP requirements;
- reduced reliance on employed labour since contracting producers cultivated their own land;
- centralized management to coordinate timing of planting, harvest and supply of quality produce from a multitude of landowners;
- provision of a number of centralized services to ensure adherence to EurepGAP quality standards and requirements;
- provision and financing of inputs to contracted farmers;
- organization of flow of produce to packing station.

When assessing Figure 6.1 and expected outcomes, it is important to note the varying levels of skills, experience and knowledge of contracts and CF. Never before had subsistence farmers in northeastern Tanzania participated in CF and very few had any previous exposure to local markets, since the focus had been on self-sufficiency. Similarly, small-scale commercial farmers had not had prior experience in growing many of the export varieties required by Meru's customers. Meru's management team was therefore required to adapt the contracts it issued to the varying demands imposed by this diversity of partners – a fact that cannot be overestimated when considering the management complexity associated with such an approach and the limited previous experience of Meru in managing a CF scheme.

6.2.2 Characteristics of the contracts with each partner

Four different types of contracts were used by Meru for engaging with each of its partners, i.e. commercial growers, emerging commercial growers, MICs and the farm estate. All the contracts aimed to stress the advantages for both sides as well as reduce any potential problems or risks. The main details of each of the contract types are described below.

Contracts with commercial growers

Commercial growers own sufficient land (2–20 ha) to produce for markets and were therefore contracted directly by Meru. This contract type was the easiest to implement as both parties had a clear understanding of their respective obligations and duties. Constant dialogue was maintained between the packing company and the growers to ensure that a common interpretation of contract clauses was maintained and consistent quality delivered. There were three main commercial growers under contract with Meru from early 2005.

Part A. *Common features.* Contracts with commercial growers shared the following standard features:

- standard price fixed for the contract period, set on a delivered-at-packing house basis, after pre-sorting and field-side grading were completed;

- standard quality description for each product produced under contract;
- a representative of the supplier was allowed to observe the grading process at the packing house;
- payment calculations based on net graded weight of product that meets quality standards;
- penalties applied for more than 11 percent rejects at packing station;
- rejects not returned;
- undersupply penalized at a fixed rate per kg for quantity promised yet not delivered;
- oversupply penalized unless it could be offset against production variation elsewhere in the system;
- payment on Friday in the week following the week of delivery.

Part B. *Special features*

Agreement Type 1: contains a financing clause where the packing house would supply (via central stores) all fertilizers and chemicals and was authorized to deduct the costs from payments for products received according to an agreed schedule.

Agreement Type 2: where commercial farmers could buy inputs from central stores against a deduction of the current week's payout. Chemicals purchased from the central stores were usually non-standard chemicals since these farmers were allowed to buy and manage their own chemicals as stipulated under the contract terms, provided they had proved their professional skills to do so through the presentation of necessary EurepGAP documentation.

Emerging commercial growers

These contracts were essentially the same as the contracts with the commercial growers described above, although there were differences in the provision of services such as input supply and technical advice. These farmers were classified as "emerging" by Meru, based on an assessment of their previous experience in growing vegetables and their technical skills. Six farmers under contract were classified as "emerging". For these farmers, the packing station would supply (via central stores) all fertilizers and chemicals and was authorized to deduct funds for these according to an agreed schedule. In addition, the agronomist would spend more time with the emerging farmers than he would with the commercial farmers, to check soil moisture levels, soil preparation, irrigation scheduling and other technical aspects. The visits would be two or three times a week, depending on the level of experience of the grower. The cost of these visits were shared on a 50/50 basis between the packing house and the farmer.

Market Intermediary Cooperatives

Members of MICs were small farmers traditionally cropping at subsistence level, usually on land under one hectare. The formation of MICs resulted in the grouping of subsistence farmers into more economically viable units, which was a clear advantage for Meru with regard to reduced transaction costs. In this way, Meru was able to incorporate subsistence farmers' land into the overall production scheme. The formation of MICs also received political support from local politicians (e.g. MPs, District Governors, Labour Union representatives), who attended the MIC

formation meetings. Out of necessity to overcome land and labour constraints, Meru offered more favourable contract conditions to the subsistence farmers organized in the MICs as compared with commercial farmers. The contracts between Meru and the MICs began in late 2004 and were signed between Meru and the leader of the MIC. Individual contracts were then signed between the MIC and participating farmers, which were countersigned by Meru to demonstrate their commitment to the smallholder farmers. The following "softer" conditions and additional support services were offered under the MIC-Meru contract:

- a permanent agronomist was seconded to each MIC
- no penalty for over- or undersupply was applied
- the excess waste/rejects penalty was suspended until all farmers in a specific MIC had completed at least one cycle of a specific crop
- initial grading was overseen at field side and/or collection points by representatives from the packing house until a certain level of skills in on-farm grading was attained

New contracts were signed with the MICs for every new crop, usually every 12 weeks as per the crop rotation cycle.

Estate-managed farms

Contract agreements between the packing station and the farm estate were also formalized as each operation represented a separate legal entity with different management responsibilities. The arrangements consisted of three parts:

- a commercial component identical to the terms and conditions included in the agreements with commercial growers;
- a buffer clause, where the estate farms could be asked to harvest at short notice to compensate for problems associated with produce delivered by other contract partners; and
- an extension component detailing the responsibilities of the estate for:
  - trial plantings with new varieties
  - field days
  - training arrangements for MIC farmers and/or emerging commercial farmers
  - assisting MICs with their accreditation administration whenever necessary, including record-keeping for traceability, etc.

6.2.3 Main features of farming contracts

The Annex gives an example of the standard contractual clauses included in the agreements between Meru Packing & Export and the farmers under contract. The aim was to standardize the approach to contracting, with additional clauses then added to this base contract as required, depending on the type of partners. For example, the softer conditions described above for the MICs were included in their contracts, whereas for commercial growers, the contracts were more detailed and complex with more risk transferred to the growers and harsher penalties for non-compliance. The details of some common clauses included in the CF agreements are discussed below.

(i) Responsibility

Details are given on the responsibilities of both contract partners, in producing and receiving crops under contract.

(ii) Guidelines on cultivation practices and specifications on product quality

All these details were pre-set and clearly defined in the *Growers' Manual* developed by Meru and provided to farmers. As members of Meru's PMO, growers agreed to follow the manual strictly and adhere to standards outlined by EurepGAP – maintaining accreditation of farming operations was of the utmost importance for Meru as their relationship with downstream customers depended heavily on this factor. Any deviation from these practices on the part of the farmer could result in sanctions or expulsion from the scheme, in cases where non-compliance could not be rectified.

From their side, Meru supervised and enforced these rules by providing extension support to the farmers as well as physical inputs. In all contracts, seeds were supplied by Meru and could not be sourced from any external provider. For other agrochemicals, centrally appointed agronomists from the Meru estate farm were responsible for monitoring all chemical and fertilizer application. Central stores could only issue chemicals and/or fertilizers to farmers if the appropriate documentation could be shown and only after prior inspection by a trained agronomist – a standard procedure under EurepGAP. While the commercial farmers were allowed to buy their own chemicals independently, they were still visited regularly by an agronomist to monitor application. Maintaining EurepGAP accreditation required continuous documentary evidence on the part of the farmers to demonstrate adherence to technical production precepts. For the MICs, this was the responsibility of the centrally appointed accreditation manager. These accreditation managers were trained and accredited by Meru but at the expense of the MIC. Meru also retained the right to veto the appointment of managers if it felt they did not meet the standards required to act as custodian of the EurepGAP accreditation for the group. Since the MICs represented four different tribes, there needed to be one accreditation manager for each tribe, i.e. four managers.

Farmers were required to plant crops in accordance with the Crop Planting and Price Programme, where Meru would advise farmers of the hectares to be planted in order to deliver the required tonnage. As part of this programme, farmers were required to submit weekly reports on forecasted amounts of vegetables to be harvested for the coming week so that Meru could plan deliveries in line with the capacity of the processing facilities, and also notify customers in the EU of the likely quantities available for supply in the coming week. Only grade one produce was purchased by the company with quality specifications for each product type clearly set out in the *Growers' Manual*. Selling of rejected grades on local or regional markets proved to be difficult because of the traditional vegetable consumption habits of consumers (i.e. preference for non-export varieties) and the low sales capacity of these smaller markets. Most rejected produce was used for household consumption or for animal feed.

(iii) Credit and advance financing

Credit and advance financing were available for the purchase of agricultural inputs as described under section 6.2.2. All farmers were obliged to buy seed from Meru, which could be deducted from the growers' account during the month when the

crop grown from the seeds was harvested or, alternatively, farmers could pay cash for the seeds on delivery.

(iv) Responsibility for transport

Meru was responsible for arranging and covering the cost of transport for production inputs to farms, of crops from growers' fields to the packing station, and of extension specialists to farms.

(v) Price agreements for commodities supplied

Prices for the various product types were pre-announced in the Crop Planting and Price Programme, which the farmers agreed to upon signing the contract, and occurred approximately every 12 weeks for each new crop cycle. For subsistence farmers, these prices were fixed prior to planting; for emerging commercial farmers a minimum and maximum price was provided in the contract and the actual price would usually fall somewhere in between; and for commercial growers the contract price was linked to the prevailing market price. Prices referred only to grade one quality as anything under grade one was rejected and therefore did not obtain a price from Meru Packing & Export.

(vi) Quality-based incentive payments

Since the production and payment scheme was only applicable for grade one crops that met EurepGAP standards, no additional quality incentives were paid.

(vii) Contingency for contract failure

This was covered by two clauses in the contracts, which related to non-compliance with EurepGap requirements, and not following the crop planting programme. In both cases, heavy penalties applied. Non-compliance with EurepGAP standards identified during inspection led either to immediate or deferred suspension. The grower either had to resolve the non-compliance issue or appeal in writing, explaining the reasons for the appeal. Any variations in the crop planting programme such as changes in planted crop areas or varieties without prior approval from Meru were considered as contractual breach. Penalties included a 15 percent price reduction to be deducted from crop delivery earnings for one month or, at worst, suspension from the marketing network.

While these penalties can be considered as more or less standard for CF agreements for export horticulture, there are more advanced and appropriate means of settling CF disputes that have emerged in recent years. As suggested in the FAO *Guiding principles for responsible contract farming operations* (2012, p. 5), "Farmers and buyers should agree in the contract on a neutral third party to assist them in the event of disputes. When contractual disputes arise, both parties should endeavour to resolve them amicably. If these attempts fail, it is advisable that the parties seek mediation or arbitration before resorting to judicial proceedings". Stipulations like these are missing from the Meru contracts.

6.2.4 Main features of the downstream buyer contracts

Prior to assessing the effectiveness of the contract arrangement from the perspective of Meru and the farmers involved, it is important first to understand the demand-

ing nature of the downstream buyer conditions as dictated by the sales contracts between Meru and its international buyers. The requirements for the various products were standardized and clearly described in the sales agreements. They included elements specifying the exact type of packaging and labelling allowed and any barcodes that had to be affixed. Various buyers had different packing and labelling requirements. Seventy-five percent of Meru's sales went directly to three supermarket chains in the EU and the United Kingdom, including the large retailers Tesco and Waitrose. The remaining sales were handled through an intermediary in the Netherlands that worked on a commission basis to service other EU retailers.

The following conditions were common across the sales contracts.

- Pricing was set on a Delivery Duty Unpaid[14] basis and payment terms were set at month-end statement plus 30 days.
- Contracts required weekly confirmation of deliverable quantities by Meru, followed by an order issued by the European buyer.
- Rejects for the period were deducted from the statement. Payment was only effected for goods ordered.
- Oversupply was often not paid for and undersupplies were penalized by placing reduced orders for subsequent contract periods.

When entering into these agreements, Meru estate did not detect the potentially unfavourable contract conditions set out between the international buyers and itself, nor did it consider the extent of market power that these buyers could exert. Under these conditions, Meru shouldered the cost and associated risk for all transport and was required to meet exact ordered volumes for each date of delivery, otherwise penalties would be applied for breach of these conditions. Yet, on the buyers' side, they could opt to reject part or full consignments of the produce with no mechanism for recourse by Meru. Delays in payments were also common when rejected produce was involved, which caused critical cash flow problems for Meru's operations.

Meru underestimated the serious consequences of these statements and proved to be unable to manage the volumes of high-quality vegetables that were entering into the system and required coordinated production and delivery schedules, sorting, packing and export in a professional and timely manner. Thus, the misalignment of conditions/incentives between Meru and the importers ultimately had an impact on the contracting system between growers and Meru, as Meru began to be penalized for its inability to manage delivery to its customers as stipulated in its sales agreements. This issue of contracting firm mismanagement will be discussed further in subsequent sections dealing with risk and internal factors with potential to influence the effectiveness of the CF scheme.

[14] DDU refers to a transaction in international trade where the seller is responsible for making a safe delivery of goods to a named destination, paying all transportation expenses but not the duty. The seller bears the risks and costs associated with supplying the goods to the delivery location, where the buyer becomes responsible for paying the duty and other customs clearing expenses. ICC, 2000.

6.3 ASSESSMENT OF THE EFFECTIVENESS OF CONTRACT ARRANGEMENTS

Both contracting parties, i.e. Meru Packing & Export as the buyer, and its production partners (commercial farmers and MICs), had to consider the potential advantages and disadvantages of entering into the CF scheme. Table 6.1 provides a summary of these issues for each of the partners.

6.3.1 Benefits for small farmers from participating in the CF scheme

Table 6.1 highlights many of the key benefits for small farmers from participating in the CF scheme, including access to new technology, credit for inputs and higher returns. The scheme built on the regional high levels of basic technical knowledge in horticulture and then offered a complete set of support services to help small-scale and previously subsistence farmers achieve high-quality production in line with contract requirements. All technical production aspects were covered through the provision of manuals and personal technical advice from cultivation specialists. In this way, contract growers were confident they could fulfil the complex indications of certified quality production. Compared with the income opportunities available from supplying produce to local markets, contract growers benefited greatly from this export outlet. Given the rotational cropping cycle to be followed according to EurepGAP requirements, farmers produced in 12-week cycles and were generally able to produce 3–3.5 cycles per year. This resulted in a net profit of US$200/plot/cycle or the equivalent of US$800–1 000/ha/cycle.

With regard to the contract indications, smallholders were completely satisfied with the strict and specific instructions in writing as stipulated in the formal contract agreements, as these were clearly explained to them when the MICs were formed and the benefits from participating quickly became evident. This finding is supported by authors such as Saigenji (2010), who also identified the positive impact of formal written production contracts on improving the technical efficiency of farmers engaged in tea production in northwestern Viet Nam, when compared with those farmers participating in informal arrangements with private firms based on trust.

As a flow-on effect from participating in the CF scheme, smallholders learned valuable cropping practices associated with the production of export crops that had positive effects on their other (subsistence/food staple) crops. For example, they learned how to handle and dispose of chemicals safely; calculate appropriate application rates and timing of application of inputs such as fertilizers and plant protection chemicals; and how to apply IPM techniques. All these factors resulted in an increase of production capacity and safer and better quality products. In addition, the by-products of grade one production (i.e. waste/rejects) were all utilized by smallholders and proved to be valuable inputs to improve family nutrition and animal production, which again supported the food supply and income of the family. Any direct sales to local markets also contributed to additional income. Livelihood in general was greatly improved for small farmers by joining Meru's PMO via participation in the MICs.

In addition to improving production expertise, Meru also collected the harvested produce and took over the transport challenge. This was highly valued by smallholders, as they were not in a position to arrange and rent transport by themselves. This is consistent with findings from a household survey conducted from 2008 to 2011 with 240 smallholders in ten villages in Meru. The survey found that 74 percent

TABLE 6.1
The pros and cons for both partners in the contract farming system

	Advantages	Potential problems/risks
For farmers	▪ Inputs and production services supplied by Meru ▪ Access to credit/advances from Meru ▪ CF introduced new technology and enabled farmers to learn new skills even though the level of cropping expertise for vegetables was already quite high in the region ▪ Farmers' price risk reduced as contracts specify prices in advance ▪ Prices for grade one products under contracting achieved unbeatable earnings compared with limited local market access ▪ CF opens up new markets that would otherwise be unavailable to small farmers ▪ On-farm rejected crops can be consumed by the family, used as fodder for farm livestock or sold in limited volumes on local markets (in particular grade two produce, commonly rejected for cosmetic reasons but virtually unblemished)	▪ Particularly when growing new crops, farmers face the risk of both market failure and production problems ▪ Inefficient management, administration or marketing problems on the side of the contractor can mean that quotas are manipulated so that not all contracted production is purchased, leading to sub-optimal income ▪ Farmers are subject to strategic and swift or seasonal management decisions that may adversely affect income ▪ Sponsoring companies may be unreliable or exploit a monopoly position ▪ Staff of sponsoring organizations may be corrupt, particularly in the allocation of quotas ▪ Farmers may become indebted because of production problems and excessive advances
For Meru	▪ CF with small farmers is more politically acceptable than production on estates ▪ Working with small farmers overcomes land and labour constraints ▪ Production under contract is more reliable than open-market purchases since more consistent quality and volumes can be obtained ▪ Close supervision of fields and farmers is achieved as Meru provides inputs and technical advice, thus ensuring production meets customer requirements ▪ Meru shoulders fewer production risks by contracting farmers and only agreeing to purchase grade one quality products. For subsistence farmers, an in-house insurance scheme was provided in the case of *force majeure*. However, no such clause was included in contracts for commercial growers since they were considered able to shoulder this risk. In this area, climatic conditions are generally very favourable and ample irrigation water is available, therefore the risk level is considered low. The high level of involvement of Meru in monitoring the production process also helped to reduce production risks	▪ Contracted farmers may face land constraints through lack of security of tenure, thus jeopardizing sustainability operations ▪ Social and cultural constraints may affect farmers' ability to produce to managers' specifications ▪ Poor management and lack of consultation with farmers may lead to farmers' discontent ▪ Farmers may sell outside the contract (extra-contractual marketing), thereby reducing processing factory throughput ▪ Farmers may divert inputs supplied on credit to other purposes, thereby reducing yields ▪ Lack of transport infrastructure (vehicles and good roads) may lead to unexpected problems in delivering according to schedule ▪ Similar to the above, reduced mobility associated with poor transport infrastructure can inhibit/delay supervision, provision of inputs and technical advice, which can negatively influence the relationship between MICs and the contractor

of farmers sold their produce to nearby markets in Meru because of a lack of financial resources and labour to transport products to more distant markets (Hillbom, 2011). Therefore, the PMO opened up a new and attractive marketing channel for farmers and at the same time allowed for associated marketing to local markets, thus demonstrating to the community that the farmers involved were no longer operating at a subsistence level. In contrast to the commonly described CF concern related to the "danger of displacing decision-making authority from the farmer to the downstream processor or distributor" (Kirsten and Sartorius, 2002: 519), in the case of Meru, this shifting of decision-making and the provision of concrete support to diversify and upgrade existing farming systems were highly welcomed and appreciated by the small-scale farmers.

6.3.2 Benefits for the company from contracting

Prior to implementing the CF scheme, Meru Packing & Export sought to increase their production capacity by leasing farms in the surrounding areas. However, obtaining lease arrangements often proved difficult and frequently incurred additional costs. The contracting of additional farm production capacity from commercial farmers and smallholders through MICs helped Meru to overcome many of these challenges as cultivation took place on the contracted farmers' land. For Meru, CF solved its fundamental constraints in land and labour and did so in a way that was politically supported at the regional level. The involved labour was an integral part of the contract and of key benefit to Meru as there were no associated direct staff costs or staff problems to be dealt with on the production side. By providing technical guidance and management through the CF scheme to a multitude of small farms, Meru was able to access sufficient land and secure production volumes required to service export markets.

The complex set of support services offered to farmers, as well as the clearly formulated penalties and sanctions to be applied if farmers broke the rules, ensured a continuous supply of high-quality vegetables to Meru, which helped them to expand their business significantly. At the same time, it reduced some of the potentially critical risks to the business since the grading took place at the packing station after transport and pre-grading had already occurred on the farm. Since Meru only purchased grade one quality vegetables, it could not be held responsible for any losses/decrease in quality associated with on-farm production problems or inadequate transport, including excessive holding periods in trucks prior to processing.

Meru concentrated its investments on improving the processing capacity of the plant and in hiring sufficient staff to provide extension and supervision services to the CF scheme initiated in 2005. It did not make any additional investments in transport logistics or other areas of the process. Over time, this created a favourable sales/cost ratio and the business model appeared to be working. At the height of Meru Packing & Export's operations in late 2005, weekly exports to the European market (United Kingdom, Germany, the Netherlands and France) totalled 60 000 kg of net weight exported, with an approximate weekly invoice value of US$400 000.

6.3.3 Risks involved for both parties

Many of the risks involved for both the farmers and Meru have been identified in Table 6.1. For farmers, there were significant risks associated with the dominant

market position of the buyers both in Meru and in Europe. The dominant position of Meru towards the farmers (whether intended or unintended) was very similar to that of a monopsonist. The risk for the individual producer was therefore significantly higher than that of Meru. Meru could abuse its position towards individual farmers by applying clauses included in the contracts such as no obligation to purchase oversupplies. Farmers collectively were also at risk from Meru not performing its duties/obligations under the contracts or that internal inefficiencies and incompetence could lead to the demise of Meru, which would harm farmers without possibilities for recourse.

However, Meru was in a similar position *vis-à-vis* its buyers. The European buyers were in an oligopsonistic position and could use their market dominance to affect Meru significantly. This was evident in the management of rejects/waste by the buyers and harsh penalties that were applied for under- and oversupply. Consequently, this resulted in the stricter application of standards by Meru towards the farmers, which negatively affected the financial returns for both parties.

6.4 EXTERNAL FACTORS

There will always be external factors that are outside the control of the direct parties involved in the contract, yet these factors have the potential to affect the likelihood of establishing and sustaining procurement contracts. Using the inventory of preconditions for CF developed by FAO (2001: 41–42), an assessment is made (favourable, adequate, marginal) in the following section of the social, physical and political environment in which Meru and its contract partners found themselves (Table 6.2). This tool is useful since it can potentially highlight weak points/marginal areas that will need to be addressed in order for a CF operation to have the best chance of success.

As highlighted from the assessment above, the area chosen for the Meru CF scheme met most of the preconditions for CF, with either an adequate or a favourable ranking for most components. In terms of the political assessment, the project was publically supported at the village and district administration level and did not face obstacles at the national level. The CF operation did not participate in or receive any governmental subsidies, thus the business developed independently. Unlike other examples of CF, such as those discussed by da Silva Júnior *et al*. (2012) in Brazil, this case did not suffer from the negative influence of state bureaucracy or negative national policies. The only major challenges were identified under the assessment on public utilities and services, where many elements were identified as marginal because of poor transport infrastructure and unreliable electricity. The transport element is an area that Meru perhaps should have considered more carefully when planning its CF operations and will be discussed further under Section 6.5.

For the physical and social assessment, outstanding physical/agricultural conditions were matched with suitable social conditions, including the participation of an experienced farming society. Good soil fertility and sufficient irrigation provided the critical production factors for the operation, and even a heterogeneous geological morphology (elevations between 1 000 m and 2 500 m above sea level) could be utilized to reduce climate risk and exploit climatological differences to produce various types of crops over an area of approximately 7 200 km².

TABLE 6.2
Inventory of preconditions for contract farming – assessment of Meru CF operations

SOCIOPOLITICAL ASSESSMENT				
Component	**Rating**			**Remarks**
	F	**A**	**M**	**F = favourable; A = adequate; M = marginal**
Political environment				
National		X		National political stability. Support for agricultural transformation of smallholders
Regional-district		X		Modest support for project from local politicians through support to MICs
Village-community	X			Positive response from local village leaders in support of MICs
Public utilities and services				
Roads			X	Few tarmac; other roads require 4x4 vehicles
Distances farm – packing station			X	Up to 60 km; challenge for agricultural advisors, transportation of inputs and collection of produce
Airport/air freight	X			Good access to international airports and air freight options
Frequency of flights		X		Adequate to service customer needs
Public transport			X	For passengers only
Goods transport			X	Low technical standard, not in compliance with EurepGAP
Telephones	X			Good mobile phone coverage. Landlines unreliable, Internet very expensive and unreliable; only by direct satellite dishes
Electricity supply for processing			X	On national grid but load-shedding occurs
Water supply		X		Adequate for project through boreholes
Hospitals and health		X		Access to government hospital for all labourers, own clinic on farm
Schools		X		Several primary schools with a high pupil to teacher ratio but a moderate level of literacy and numeracy achieved during primary schooling. High school only in town
Government agencies		X		Positive response from research and extension sections (Ministry of Agriculture)
Quarantine services		X		Good location and well administered
Customs services	X			Very cooperative; good knowledge of African Growth and Opportunity Act (AGOA) and EU preferential trade agreements

TABLE 6.2 (*continued*)
Inventory of preconditions for contract farming – assessment of Meru CF operations

PHYSICAL AND SOCIAL ASSESSMENT				
Component	**Rating**			**Remarks**
	F	**A**	**M**	**F = favourable; A = adequate; M = marginal**
Market identification				
Fresh produce (export)	X			Strong demand from EU markets for high-quality, EurepGAP-certified fresh vegetables
Fresh produce (domestic)			X	Low demand for secondary grades in fresh form on local/regional markets
Demand for value-added products (frozen, canned)			X	Only in international market, local demand insignificant, transport cost a hindrance
Physical environment				
General climatic factors	X			Adequate, no frosts, 80% sunlight hours
Rainfall		X		Seasonal; good water catchment system
Natural water availability		X		Adequate for crop requirements
Irrigation availability	X			Most subsistence farmers have gravity-fed flood irrigation; others have combinations of pump and gravity-fed drip and micro-irrigation
Soil fertility	X			Soils very suitable for crop cultivation
Topography	X			
Natural vegetation	X			Natural vegetation can be incorporated into IPM system
Social and farming environment				
Existing cropping mix	X			Practice of inter-row and relay planting; traditional polyculture
Historic productivity	X			Very productive farming community
Cultural influences	X			Cultural obligations form no obstruction to project when understood and incorporated into management
Land tenure				
Estates above 30 ha	X			99 years leasehold, registered at district level, can be forfeited if abused
Commercial farmers 2.5–30 ha	X			99 years leasehold, simplified conditions
Subsistence farmers		X		Land for subsistence allocated by village chief; can be forfeited when abused, no registration

Source: adapted from FAO, 2001.

A highly profitable market was identified prior to the commencement of the CF scheme as the Meru estate had already been exporting small quantities of EurepGAP certified vegetables to Europe from their own vertically integrated operations and found this to be profitable. However, it is also important to acknowledge the competitive environment for high-value vegetable exports from the United Republic of Tanzania when considering the expansion strategy adopted by Meru. An analysis of the fresh fruit and vegetable value chain subsector in the country conducted in 2008 identified several weaknesses, including strong competition for new entrants with long-established exporters in Kenya; insufficient direct air freight connections to support high export volumes; and no clear differentiating factor or strategic advantage for Tanzanian exporters over their competitors (MMA, 2008). Meru should also perhaps have paid more attention to these areas.

Despite the generally positive and favourable overall external preconditions for the CF scheme, more attention should have been given to internal factors such as firm-level competency in financial and administrative management and operations. As highlighted by Prowse (2012: 35), this is an area that is often neglected in CF literature yet "clearly the ability to create and sustain contract farming operations relies to a large extent on the skills and experience of (contracting firm) staff and the ability of the organization to maximize these".

6.5 INTERNAL FACTORS

6.5.1 Assessment of management, financial and administrative aspects

Partners entering into CF agreements with Meru did so under the implicit assumption that the company was in fact in a position to fulfil its managerial and financial tasks associated with running the CF operation. However, as time passed and the CF operations were gradually expanded during the period from 2005 to mid-2006, it became evident that there were shortcomings in the management, financial and administrative aspects of the business.

TABLE 6.3
Examples of some short-term finance requirements for the CF operation

Variable costs	Value
Input finance for five-month period prior to harvest	US$1 900–2 100/ha depending on crop ~US$460 000 per 12-week production cycle on 220 ha
Vegetable purchases	~US$1 000/ha net profit for farmers ~US$18 000 per week (18 ha harvested on average) or ~US$220 000 per cycle
Packaging materials	US$0.77–85/kg ~US$50 000 per week for 60 000 kg
Freight costs (paid in advance)	US$2.05–2.55/kg ~US$140 000 per week
EurepGAP initial accreditation costs	~US$50 000/10 ha This cost includes costs associated with production of one full cycle that cannot be delivered as per EurepGAP guidelines

One of the major shortcomings was associated with poor financial management. The short-term financing (i.e. working capital) required to support the CF operations was significant and had been grossly underestimated by the contracting company that had previously only managed its own production estate. In the past it had not needed to maintain large inventories of agro-inputs and packaging materials; provide financing for input supply; or cover transport costs of produce from distant farms to the packing station. Table 6.3 gives an estimation of some of the variable costs involved as an example of the capital required to run the CF operation.

In addition to some of the variable costs highlighted above, there were also other ongoing costs associated with providing support services to farmers, including technical assistance and monitoring. Additional technical and administrative staff had to be hired by Meru as well as causal labour for the packing house operations. At the height of the export operations, the packing house was running two shifts per day with 400 staff employed per shift. With a liquid working capital limit of approximately US$600 000, Meru fell well short of the ~US$2.7 million required per production cycle. This was not helped by the fact that payments from buyers in Europe were generally made six weeks after export.

Meru also incurred costs in the setup of the MICs, which were entirely funded by the packing house. Various avenues were explored to discuss grant funding with a number of Non- governmental Organizations (NGOs) and foundations, however the conditions to access these grants were either not acceptable to the business or too difficult to fulfil. Locally active NGOs tended to overemphasize their own cultural and society backgrounds, which did not fit with Meru's more business-oriented approach. Thus, the search for funding through NGOs failed. In reality, securing funding for the enlargement of Meru's vegetable exports should have been done before the operations started, with options for both grant funding to support the MICs and commercial financing explored for the various elements of the CF scheme. The requirements associated with accessing external funding would probably have helped Meru to build better checks and balances into their system, which would have helped to identify cash flow problems earlier on.

On the administration side, weaknesses emerged in the way production and marketing data were collected and managed. Many areas of the business used a paper recording system to maintain production records, inputs supplied, harvest forecasts, etc. Administration of these records was then undertaken at a central office where the information was entered into two separate programs. The software for the financial administration was a normal off-the-shelf accounting program, while the EurepGAP administration was a customized database package.

Unfortunately, the management of Meru never identified the need to use an integrated marketing and bookkeeping software package that could provide linked information on both the production and the marketing/sales side of the business. Such a simple but nevertheless extremely effective investment would have provided economic and operational analyses that could have greatly supported firm decision-making. For example, information on the flow of cash and goods, transport costs, and production data including the use of inputs, quality and waste/reject percentages of crops delivered from each grower, among other information, would have helped the management team to track the performance of the business and react accordingly to problems. Neglecting the use of such tools indicates the limited

managerial skills and experience of Meru's management team, which had previously only been responsible for the management of an estate farm with a comparatively simple operational and financial structure. As discussed below, other organizational and technical shortcomings also went unnoticed with significant impact on the farmers and the overall business.

The complexity of Meru's CF and export operations, when coupled with a lack of management skills (especially financial management), over time resulted in an ever increasing shortage of working capital. In the end, this was fatal for the enterprise, and it eventually collapsed in March 2007.

6.5.2 Assessment of organizational and technical aspects

All contracts clearly state Meru's responsibility for transporting produce from the fields to the packing station. Yet rather than investing in refrigerated trucks that would have resulted in a considerable improvement in shelf-life and a higher percentage of grade one vegetables, Meru rented open-load trucks. Crops were hand-harvested and frequently loaded on to the vehicles in almost perfect condition. However, long transport times, bad roads and exposure to the elements meant that upon arrival at the packing house, considerable waste was detected (e.g. wilting, decolouring), which led to lower grade one percentages. Despite the fact that this situation fell outside the control of the farmers, they were the ones who carried the risk and ultimately suffered from lower returns and penalties for high reject levels. This problem was never acknowledged by the management and no steps were taken to address the issue, and so the negative effect of cheap open transport on grade one production performance persisted.

In addition, instead of optimizing the results of the existing number of growers on a given land area, Meru chose to extend the production network and increased the total size of the production area and the number of farmers involved. This approach further increased the negative transport effects – to the disadvantage of all growers involved. Committed and diligent farmers contributed both their land and labour to the CF scheme and expected in return that Meru's PMO would also fulfil its obligations under the contract in a responsible manner.

6.6 CONCLUSIONS AND RECOMMENDATIONS

6.6.1 Conclusions

This case demonstrates the suitability of CF as an institutional mechanism to overcome land and labour shortages and meet the needs of quality vegetable production according to EurepGAP standards. The comprehensive contractual package with a full range of support services was welcomed by over a thousand small-scale farmers who desired to benefit from the income opportunities offered by the scheme. The organization of farmers into MICs proved successful, based on clear communication with partners and the involvement of intermediaries such as village chiefs who ensured that the details of the contracts were fully understood. The transmission of technical expertise and ongoing technical supervision helped farmers to achieve certification standards. Meru's contracts were in fact able to help farmers develop new skills and access more demanding and lucrative markets. However, from the internal perspective of corporate development, Meru's management and administrative body was neglected, with little consideration given to their critical role and contribution to the system.

No attempt was made to integrate the administrative systems with the operational processes, and in the absence of modern software tools to supervise flow of goods and payments, problems were not detected until too late. Management at all levels did not have the necessary skills and experience to manage such a complex operation. Consequently, cracks began to appear in the operations where poor transport decisions and mismanagement of the packing station throughput led to the downgrading of grade one produce into waste. Ultimately, Meru's weak customer orientation, skills and experience (in particular its management and administrative staff) led to growing frictions between producers and the packing station, and resulted in increased penalties and reduced downstream orders from its European customers.

Financial and operational management skills and experience of staff on the side of the contractor are no soft criteria and should be considered as an essential precondition for successful CF. When planning the transition from a simple farm estate management structure to a complex CF scheme, the financial and operational management capabilities of the management team should have been further scrutinized. Thus, from the beginning, the project carried an inherent defect that eventually lead to its demise and negatively affected hundreds of farmers in northeastern Tanzania.

6.6.2 Recommendations to improve contracting for all parties

Because of its proven experience in vegetable production, Meru designed its CF system with a primary focus on securing a consistent supply of certified vegetables. However, the extrapolation of the skills of former staff with the experience of running a simple estate administration does not extend to the complex and demanding requirements of an international production and export business. Therefore, when designing and implementing a contracting scheme, the following requirements related to management should be stipulated.

- Management must have previous experience in running an enterprise of similar scale with a similar operational approach.
- It should have proven financial management experience.
- Reliable routine administrative tools and up-to-date computer support programs must be in place that integrate both the production and marketing/export side of the business.
- Administrative and managerial staff should have clearly defined roles and skills and experience must be developed that can support both the production and export operations of the business in an integrated manner.

In 2009, at an export conference,[15] a round-table discussion on a similar case was held and participants proposed the following recommendations.

- Accurate estimation of the long- and short-term finance needs must be determined prior to commencing a CF operation with smallholders.
- The various options for external financing and the role that financers may play to support the CF scheme must be understood.

[15] 3rd Annual Africa Trade & Investment Conference – panel discussion, Cape Town, South Africa, 26-27 March 2009.

- Improving the flow of information (type of information, timeliness of information) from the processor to the various financiers is critical.

One suggestion that could overcome some of the internal challenges discussed in Section 6.5 is the adoption of an external accreditation system to certify the management systems and practices of the packing and export business. Firms engaging in the production of certified quality crops are familiar with quality management systems and thus the adoption of such an internal system would most likely have prevented the operational and financial problems from going unnoticed until too late. However, the cost of implementing and maintaining such a system would need to be considered and would be largely dependent on the scale of the operations. Regardless of whether certification would ultimately be achieved, preparation of the business through implementation of these standards would undoubtedly have been of use and may have prevented the overall failure of the CF system as observed in the case of Meru.

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ANNEX

Specific contract features for both contract parties

CONTRACT HEADINGS
Specification of contract partners, season, date and general stipulations between Meru Packing & Export and the grower.
Meru and the grower wish to enter into a contract wherein the grower sells fresh produce to Meru.
Meru purchases fresh produce for the export market.
Meru would like to be assured of its supply of fresh produce.
The grower has a farm capable of growing fresh produce.
The grower wishes to sell fresh produce to Meru.

OBLIGATIONS/UNDERTAKINGS/RESPONSIBILITIES	
Meru shall	**The grower shall**
1. Provide a *Growers' Manual* in which the methods of production are outlined.	1. Agree to be part of a PMO and by signature accepts membership in such an organization of farms supplying Meru.
2. Provide the instructions and information on all infrastructure requirements needed to fulfil the contract.	2. Follow the systems and guidelines set out by the PMO; all fertilizers and chemicals must be sanitary checked by the Meru agronomist or his assistant before application. Growers agree that their outlet is part of the PMO management system.
3. Set out all the management systems in the *Farm Operations Manual*, which must be followed by the outgrower as Meru is the PMO (Produce Marketing Organization).	3. Follow the instructions in the *Growers' Manual*. Failure to follow such instructions and or such amendments, as the Meru technical staff shall provide shall be deemed cause for annulment of this contract and any obligation to purchase product.
4. Provide technical advice in the methods of production.	4. Contact or otherwise have available all the infrastructure requirements that shall be required as in paragraph 2 hereinabove.
5. Provide exact specifications for the product to be accepted under this contract in the *Growers' Manual* or by subsequent communication.	5. Follow Meru's technical advice within reason. Should the grower not follow Meru's technical advice, it shall be deemed cause for annulment of this contract and any obligation to purchase product.
6. Provide transport of the product from the grower's farm to Meru.	6. Make production records available to Meru.
7. Provide samples of all records needed (forms).	7. Adhere to the EurepGAP standard. Sanctions may be applied to the grower in case of the EurepGAP requirements not being met. Upon finding that the grower no longer conforms to the EurepGAP standard, the internal auditor will report this to Meru, detailing the non-compliance identified during inspection. This will lead to immediate or deferred suspension. The grower must either resolve the non-compliance communicated or appeal in writing against the non-compliance, explaining the reasons for appeal.
8. Make available to the grower product of an equal weight to any product not accepted for failure to meet the specification. Such returned product will be whenever possible the grower's own product.	
9. Grade the grower's product to the required specification and weigh that product which satisfies the specification and shall pay based on this weight.	
10. Make available to the grower a "batch history" document detailing the product to specification, the rejected product and the reasons for rejections.	
11. Open the packing house office for growers to visit *without* prior notice, during working hours and to observe the grading and weighing of the product obtained from their farms.	

OBLIGATIONS/UNDERTAKINGS/RESPONSIBILITIES	
Meru shall	**The grower shall**
12. Supply seeds at the grower's expense, which shall be deducted from the grower's account the month of harvest of the crop grown from those seeds or to be paid for in cash by the grower. The grower shall under no circumstances plant seed varieties other than those provided or specified by Meru. 13. Pay the grower for all to-specification products delivered to the packing house where such product falls into the limits described in the clauses below. 14. Pay the grower on the first banking day on or after the 15th of each month for the to-specification product received during the previous month. At Meru's discretion the "previous month" shall be the calendar month or the total days of all weeks whose Friday falls in that month. Meru shall buy ALL the produce that the grower produces, so long as it meets specification and agreed tonnage is supplied. 15. Purchase produce by kg. This will be agreed upon with each grower and clearly indicated on the crop planting and price programme. The grower will be required to deliver the indicated tonnage each week on the itemized list to be delivered before Friday midnight. Should the grower deliver in excess of order, Meru will have an option to buy but not be obliged to do so.	8. Follow the Tanzanian labour code and all other laws and regulations of Tanzania. 9. Agree to act in accordance with the "Meru Ethical" code and in a socially responsible and environmentally friendly manner. 10. Inform Meru of any incident, situation or occurrence, which may, adversely or positively, affect the expected production or the timing of the expected harvest. 11. Plant sufficient land to fulfil the Crop Planting and Price Programme where Meru shall advise the hectares needed to make the indicated tonnages. 12. Acknowledge that any change to the areas, crops or varieties without the knowledge and consent of Meru shall be considered a breach of this contract. Should the grower fail to plant according to the programme, and not inform Meru in time nor have a good reason for not planting, there will be a price reduction of 15 percent. This will be deducted from that crop for a total of one month's delivery, choosing the delivery of that month or the previous month's deliveries. 13. Deliver and sell to Meru all to-specification product, as a result of the said planting and under no circumstances shall the grower sell such to-specification product to any other parties or persons. 14. Allow Meru reasonable access to the farm without notice and to inspect the farming thereon. 15. Send in a weekly Export Forecast to Meru, no later than Friday of each week. Meru will provide the format. 16. Give Meru a notice period of 60 days of withdrawal from the PMO unless agreed otherwise by both parties.

Deliverables of Meru	**Deliverables of the grower**
▪ *Farm Operations Manual* ▪ *Growers' Manual* in which the methods of production are outlined ▪ Crop Planting and Price Programme ▪ Data record forms for the grower ▪ Export Forecast Form (weekly from grower to Meru) ▪ Technical advice ▪ Visits of a trained EurepGAP agronomist ▪ Transport of the product from the grower's farm to the packing station	▪ Weekly export forecast reports to Meru ▪ Provision of production records (on request) ▪ Adherence to EurepGAP standards ▪ Inform Meru on every event related to planned harvest ▪ Plant sufficient land to fulfil Meru's Crop Planting and Price Programme ▪ Exclusive delivery of produce to Meru

Chapter 7

Organic chocolate for the Swiss market: Contract farming in the cocoa sector in Honduras

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7.1 INTRODUCTION

When small-scale farmers in developing countries secure contracts with large international buyers, they are protecting themselves against certain risks such as short-term price fluctuations and other market uncertainties. However, there are certain conditions that must be met to keep all parties satisfied with the commercial relationship that has been established. There are several agricultural sectors where contract farming (CF) is less common, including the coffee and cocoa sector. Coffee and cocoa producers in developing countries have arms-length contact with intermediaries and there are few cases of CF for cocoa. This chapter presents the case of small-scale cocoa farmers in Honduras, who have been able to establish CF agreements and a solid commercial relationship with a Swiss buyer.

This example from the field gives a different view as to how farmers can secure a sustainable income from the relationship established between an international buyer, which procures directly from them, and other local actors. Partnerships between the cocoa producers, the private firm and Non-governmental Organizations (NGOs) go beyond a contract; it is in the mutual interest of all parties to achieve a common goal that keeps all stakeholders committed to the relationship. A decade ago, most cocoa producers were abandoning their plantations because the prospects of a sustainable income from cocoa production were so grim. It has since become a reality for farmers to generate a reasonable livelihood from the income associated with cocoa production. The interaction among so many different actors in the sector, because of CF, was crucial in linking these farmers to a Swiss buyer.

7.2 HONDURAN COCOA FOR THE SWISS CHOCOLATE INDUSTRY

Numerous corporations worldwide source raw materials from developing countries, often not knowing exactly who is producing these commodities. This has particularly been the case in the chocolate and coffee industries. However, consumers in Europe, and especially in Switzerland, are increasingly demanding more information about the products they buy, thus motivating corporations to find ways to respond to these demands. In response to the changing market trends, Chocolats Halba, a division of Coop, one of the largest retailers in Switzerland, has launched a

pilot project that embraces its corporate philosophy of working with a supplier base it calls "partners" as opposed to unknown suppliers in developing countries. Other partners include NGOs, farmers' associations, local and regional research institutions and development cooperation organizations. Since 2008, Chocolats Halba has developed a collaborative relationship with about 500 organic cocoa producers in Honduras, who have now come under a contract scheme where they are supported in production and certification aspects, given access to credit and paid a fair price for their product.

Chocolats Halba is working with Helvetas, a Swiss private development cooperation organization (now called Helvetas Swiss Intercooperation), the Honduran Association of Cocoa Producers (APROCACAHO) and other partners in Honduras. They assist organic cocoa farmers in quality improvements, building up infrastructure and complete all the necessary export-related paperwork. Local and international partners have helped farmers in strengthening their organization, acquiring certifications (organic, fairtrade), and capacity building with regard to cocoa production. This relationship between the producers, Chocolats Halba and other partners is beneficial to all parties, as the result of the close collaboration with the organic farmers means that Chocolats Halba can source directly from producers, and is able to trace the product it will sell to consumers in Switzerland right down to the farm level. Furthermore, a strong relationship and mutual investments enable the value chain to improve quality jointly and therefore add value to the product. These organic cocoa farmers in Honduras are now profiting from having a secure buyer and a better income. Chocolats Halba has a secure source of certified organic cocoa beans, is improving the transparency of the value chain and assuring the farmer a fair price in a long-term perspective.

7.3 COCOA PRODUCTION IN HONDURAS: RELEVANT ASPECTS

Cocoa has been grown in the Mesoamerican region for centuries and has its origins in the region. Historians have found traces of cocoa consumption in the Ulúa valley in Honduras and traced cocoa consumption as far back as 1150 BC (Joyce and Henderson, 2010). For the Mayas, the cocoa bean was of great value and was also used as a form of currency. Cocoa was consumed as a thick and bitter beverage, known as *xocoatl*, made from ground cocoa beans mixed with water, black pepper, vanilla and spices. It was first brought to Europe by the Spaniards, but sugar was added to suit the taste of Europeans and by the late seventeenth century it had gained great popularity in France, although it was a luxury enjoyed not by the masses, but by the nobility. Subsequently, the invention of the cocoa press and a dramatic drop in the prices of sugar and cocoa made chocolate popular among people of all income levels. Switzerland, and most prominently the Nestlé, Lindt, Suchard and Sprüngli companies became dominant actors in the expanding chocolate market.

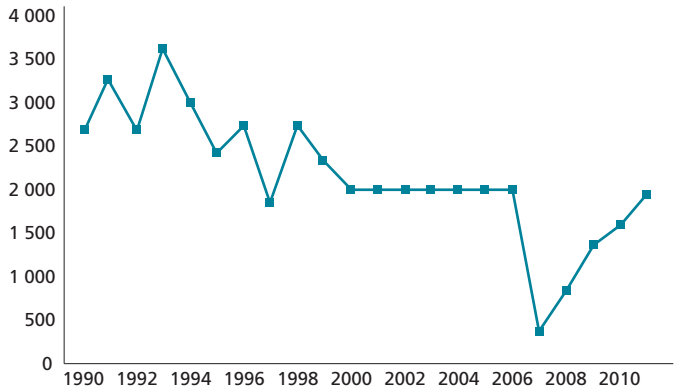
Cocoa cultivation has had a long tradition in Honduras and the Mesoamerican region, but coffee has become the leading agricultural product in terms of production volume and trade. Over 90 000 families (SAG, 2010) depend on coffee production, compared with a mere 1 200 families producing cocoa. Nevertheless, cocoa production is still an important agricultural product for farmers in Honduras and the market is currently growing. During the 1980s and 1990s, the cocoa sector in Honduras was booming, but in 1998 most of the cocoa plantations in northern Honduras were

badly hit by Hurricane Mitch and producers reported significant economic losses. Another factor that distressed cocoa producers in the years after Hurricane Mitch was the farmgate price for cocoa. According to the ICCO (2010), the liberalization of cocoa marketing systems in the 1990s was reflected in the farmgate prices in most cocoa-producing countries which were consequently largely determined by international prices. Farmgate prices have shown greater fluctuations in most cocoa-producing countries since the mid- to late 1990s. The price for cocoa today depends not only on changes in international cocoa prices, but also on variations in the international value of the domestic currency, and specific local market structures and conditions (for example taxation, competition, distance from port and quality).

Despite the fluctuations in production experienced over the last 15 years (Figure 7.1), cocoa production in Honduras in recent years looks promising. According to a report by PYMERURAL (2010b), Honduran cocoa producers are gaining access to a very specific market segment, because of the conditions under which cocoa is currently produced in Honduras, i.e. cocoa is grown with fruit trees, which give the beans a particular flavour. International retailers have shown interest in sourcing cocoa from Honduras for the high-end retail market. Additionally, diverse NGOs, public and private organizations and development cooperation programmes have been active in developing the potential of small-scale producers to meet the demands of the international market. Public and private actors have been influential in the expansion of the cocoa sector. In 2008, over 250 000 new cocoa trees were planted (PYMERURAL, 2010a). Particular attention has been paid to organic production.

Most of the cocoa production in Honduras is concentrated on the northern coast, which has ideal climatic conditions for production. The geographic departments are Cortés, Atlántida, Yoro, Santa Bárbara and Gracias a Dios, which account for 950 of the estimated 1 200 cocoa producers in the country (SAG, 2010). In other departments, namely Copán and Olancho, cocoa plantations have not yet reached

FIGURE 7.1
Total cocoa production in Honduras (tonnes)



Source: FAOSTAT, 2013.

FIGURE 7.2
Distribution of cocoa production in Honduras

Source: PYMERURAL, 2010b.

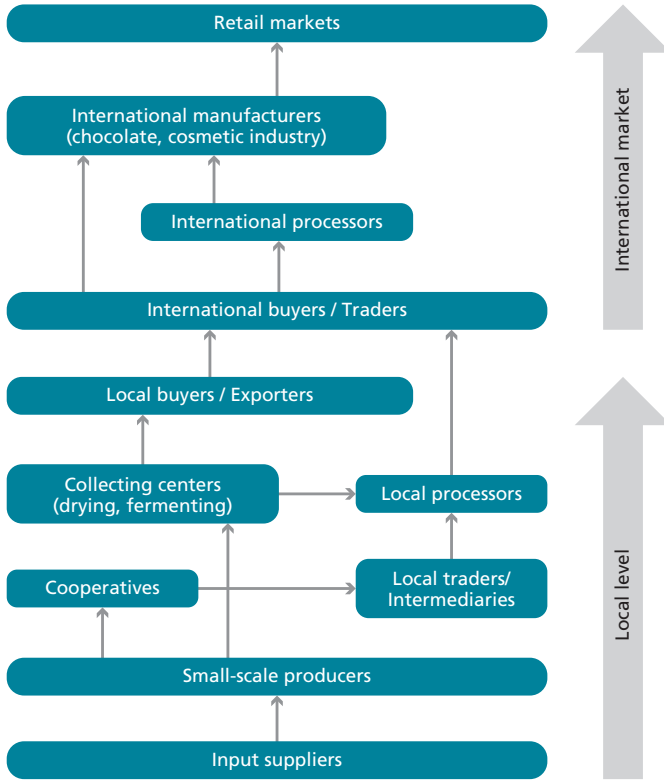
a maturity stage (Figure 7.2). The Honduran Ministry of Agriculture (SAG, 2010) reports that there are roughly 2 100 ha of cocoa planted nationwide and most of the cocoa is produced on areas of 2 ha or less. Cocoa production is almost exclusively in the hands of small-scale farmers. Most cocoa farms are found in areas 200 m above sea level and since cocoa trees require shade, most farms have several fruit and wood trees. The fruit trees commonly found alongside cocoa production are mango and avocado. Tropical trees are also often planted, typically from the Aquifoliaceae, Mimosaceae, Combretaceae and Meliaceae families (FHIA, 2007).

One of the biggest challenges for producers in Gracias a Dios department is access to collection centres or buyers. The Mosquitia, a tropical rain forest, is located in this area and there are no roads, making access to potential customers extremely difficult. In fact, the cocoa beans are typically transported by small wooden boats to Brus Laguna, a larger coastal town in Gracias a Dios. Producers in all other areas have easier access by road to San Pedro Sula, the second largest city in the country and the place where most buyers are to be found.

7.4 ACTORS AND INTERACTIONS IN THE COCOA VALUE CHAIN

At the local level, small-scale farmers are at the base of the cocoa value chain (Figure 7.3). Input suppliers mainly sell fertilizers and pesticides to the producers. Until recently, producers had contact with intermediaries who would buy the cocoa beans and transport them to collection centres for drying and fermenting (CATIE, 2006). There are few processors, mainly the plant built by APROCACAHO in San Pedro Sula, but some of the production is also sold to neighbouring countries,

FIGURE 7.3
The cocoa value chain in Honduras



Source: Author's own.

mainly Guatemala, El Salvador and Costa Rica (SAG, 2010). The local industrial demand for cocoa is weak, with approximately 14 industrial plants that demand cocoa for further processing (mostly for cocoa powder) – total volumes absorbed by these local processors is an estimated 3 percent. Most of the *cooperativas* (farmers' associations) carry out trade agreements and negotiate with international buyers. Until 2009, up to 98 percent of the total national production was exported to the United States of America, Belgium, the Netherlands, Spain, Costa Rica, El Salvador, Guatemala and Italy (SAG, 2010).

In general, cocoa producers in Honduras have limited technical knowledge related to production aspects, particularly organic production; they also have scarce resources. In a survey conducted by PYMERURAL (2010b) where over half the cocoa producers in Honduras were interviewed, only 5 percent had acquired secondary-level education. The vast majority of small-scale producers had but a primary-level education. The fact that the education level is so low makes aspects such as managing production costs, dealing with standards and negotiating with traders more challenging. APROCACAHO and other organizations such as FHIA,

TABLE 7.1
Main actors in the cocoa value chain in Honduras

Name	Scope	Type
APROCACAHO	Honduran Association of Cocoa Producers (also a processor)	Association (Honduras)
Chocolats Halba	Cocoa buyer	Private enterprise (Switzerland)
Helvetas	Private development organization	NGO (Switzerland)
FHIA	Honduran Foundation for Agricultural Research	Research institution (Honduras)
PYMERURAL – Swisscontact	Programme for Rural Development – Swiss Foundation for Technical Cooperation	Regional public-private partnership (PPP) (Honduras, Nicaragua, Switzerland)
Ecomercados	Project executed by the Swiss Foundation for Development and International Cooperation (Intercooperation)	NGO (Switzerland)
TechnoServe	Business development organization	NGO (United States of America)
FUNDER	Foundation for Rural Enterprise Development	NGO (Honduras)
Kawo Bu Kaya	Cocoa Producers' Association (Mosquitia)	Association (Honduras)
MOPAWI	Local capacity-building organization (Mosquitia)	NGO (Honduras)
APACH	Agroforestry Producers' Association, Choloma	Association (Honduras)
APROCAFICH	Fine Cocoa Producers' Association, Choloma	Association (Honduras)
EACPAC	Cuyamel Producers' Association	Association (Honduras)

Source: Author's own

TechnoServe, diverse NGOs (see Table 7.1) and, in the last few years, Helvetas, have been active in training these producers.

Training small-scale cocoa farmers is one important way to increase production and improve yields, although financial resources are equally as important. The total average monthly net income of the producers is lower than US$320 (PYMERURAL, 2010b). An average family has six members, which means that there is little money to invest in proper infrastructure (for storing, drying and fermenting cocoa beans) and transportation to the collection centres. Thus, farmers have had to rely heavily on intermediaries to buy the cocoa and transport it to the centres for processing. The price paid for unprocessed beans is low and intermediaries often pay producers the lowest price they can, leaving producers little bargaining power.

Nevertheless, funding options for small-scale producers are becoming increasingly available. These funds are usually credits from specialized institutions that aim at helping farmers. Access to credits from private banks is difficult and tied to conditions that most farmers cannot meet. One of these organizations giving credit to cocoa producers is FUNDER (the Foundation for Rural Enterprise Development). Through a strategic alliance with APROCACAHO, FUNDER has assisted over 500 producers with small loans. As the cocoa sector continues to grow, more funding will be available to producers. Another form of assistance has been the Coop Sustainability Fund, which has been used to improve post-harvest infrastructure.

FHIA, the Honduran Foundation for Agricultural Research, has invested over 25 years of research in cocoa and agroforestry. New technologies and knowledge on the sustainable production of cocoa in agroforestry systems have been generated and transferred by this institution, which has an agroforestry research station with an extension of 145 ha. A wide array of genetic material is collected there and used for demonstration purposes. FHIA promotes the replacement of low-value crops with high-value cacao agroforestry systems. FHIA was one of the first and most relevant alliances established by Chocolats Halba when the project was first launched and since then it has provided expertise on cocoa production to the farmers. FHIA has carried out substantial work in the Mosquitia region over the past few years (FHIA, 2008).

Swiss organizations are notably present in the sector and have funded several projects and programmes to support the cocoa sector in Honduras. For example, PYMERURAL is a programme of public-private regional interaction, national and local for the competitive development of the rural micro, small and medium enterprises (MSMEs) in Honduras and Nicaragua, funded by Swisscontact. It has two complementary approaches: value chain and territorial local economic development. It is aligned with relevant public policies in both countries, promoting the capacity building of different actors and actions for inclusive economic development. PYMERURAL has worked in partnership with the Ministry of Agriculture, APROCACAHO, FUNDER, FHIA, Ecomercados and Helvetas Honduras to improve financing mechanisms for cocoa producers, designing and implementing a competitiveness monitor for the cocoa value chain (PYMERURAL, 2010a). According to Mr Anibal Ayala, President of APROCACAHO, the support of PYMERURAL has helped APROCACAHO "position itself as the leading organization representing the interests of cocoa producers, encouraging the affiliation of other smaller farmers' organizations".

The most relevant Swiss organization, which has been key to linking cocoa producers with a private company in Switzerland, has been Helvetas Swiss Intercooperation. Since 2007, it has been working closely in Honduras with APROCACAHO, Chocolats Halba, Ecomercados, FHIA, FUNDER, PYMERURAL and TechnoServe. APROCACAHO, as the main institution responsible for the development of the cocoa sector in Honduras, was a key partner for Chocolats Halba. APROCACAHO, founded in the 1980s, currently represents about 600 small-scale producers located throughout the country. Until recently, an estimated 95 percent of the total cocoa production in Honduras was traded through intermediaries to APROCACAHO. Intermediaries bring the cocoa beans to the collection points, especially from remote places with difficult access, such as the Mosquitia region in eastern Honduras. Contracts were established between Chocolats Halba and APROCACAHO.

7.5 LINKING COCOA PRODUCERS TO THE SWISS MARKET: THE CHOCOLATS HALBA EXPERIENCE

According to CAOBISCO (2011), Switzerland has the highest per capita consumption of chocolate in the world, averaging 10.8 kg per year. It has a long tradition in processing cocoa and chocolate confectionery and represents a huge industry. Not only are the Swiss conscious about the choices they make, but they are also looking for high-quality products. They have a sense of responsibility that sets them apart from many consumers in the world. Supermarkets, in particular the Coop, clearly

designate the origin of their products – a response to the need for information by Swiss consumers and a trend that is becoming more popular and necessary. The function of a product is not only to fulfil a need or want, but also to do so in a way that speaks for the values of the consumer.

The selection of a pilot project in Honduras was most appropriate, given the five issues this company has as core values. The goal Chocolats Halba has set for itself is to produce high-quality chocolate, while helping farmers in cocoa-producing countries to earn a sustainable income. Biodiversity should be safeguarded and the environmental impact should be as minimal as possible. Because of the location of the cocoa producers in the Patuca region in the tropical rain forest, the project also has to deal with aspects related to the conservation of biodiversity and sustainable production. Thus, Chocolats Halba has positioned itself to respond to customer demands while maintaining its corporate values.

Helvetas first came into contact with Chocolats Halba with the intention of linking Honduran producers with a private company in Switzerland in 2007. After an exhaustive analysis of the cocoa regions in the world, the ten most important cocoa-producing regions were identified and Honduras was selected because of its potential. According to the studies undertaken, the genetic material of the cocoa in Honduras is ideal for the production of high-quality organic chocolate. In 2008, the project started and other local partners were brought on board. APROCACAHO was the first partner approached and contracting schemes were drawn up. A multipartite contract was established between Chocolats Halba, APROCACAHO and the cocoa farmers. Other partners included the following farmers' associations: APACH, Cooperativa San Fernando de Omoa, Kawo Bu Kaya and Flor de los Laureles. Part of the contract with APROCACAHO included funding for the project, which came from three sources: Helvetas, Chocolats Halba and the Coop Sustainability Fund. The first phase of the project was executed from 2008 to 2010. The following targets were achieved:

- reforestation of 150 ha of tropical rain forest under an agroforestry system, benefiting 150 rural families
- building up the infrastructure of two associations for drying and fermentation of cocoa beans, as well as warehouses
- analysis and improvement of the drying and fermenting processes
- export of the first container to Switzerland
- production of the first chocolate prototype made from Honduran hybrid cocoa beans

The second phase of the project began in 2011. At this stage, the main goal was to improve the sustainable income of farmers by establishing a long-term supply chain. An important characteristic of this chain is that the cocoa has to be organic and fairtrade-certified. The project partners expect that the cocoa producers and the associations that represent them take leadership in the execution of the required processes for production, post-harvest management, marketing and other administrative aspects required by the organic and fairtrade labels. They should also continue expanding the agroforestry systems in other regions of the country such as Olancho, seeking sustainable production in order to position Honduran cocoa in the high-quality international market. Financial systems and *ex ante* export

guarantees have been promoted so that small and medium-sized producers have a higher incentive to engage in organic production of cocoa. These financial systems must also provide a safety net for those organic farmers who are already producing organic cocoa, mostly because they have to meet certain criteria for the agreement to persist (such as meeting certain export volumes).

Although the demand for organic cocoa is growing at a fast pace, the organic cocoa market still represents a very small share of the total cocoa market, estimated at less than 0.5 percent of total production (ICCO, 2010). Certified organic cocoa producers must comply with all requirements of importing countries on production of organic products. Given the complexity of these transactions (i.e. paperwork, costs), the main incentive for cocoa farmers is that organic cocoa commands a higher price than conventional cocoa, usually ranging from US$100 to US$300 per tonne (ICCO, 2010). Countries with smaller production volumes, such as Honduras, can fetch much higher premiums if they sell fine or high-quality organic cocoa. This premium should cover both the cost of fulfilling organic cocoa production requirements and the cost of going through a compliance process to acquire organic certification. Although Helvetas and Chocolats Halba, together with APROCACAHO, have helped farmers meet these requirements by providing the necessary training and assisting in the certification process, the premium must be high enough for them to cover the less tangible costs, such as the time and effort invested in the whole process.

7.6 A STEP BEYOND CONTRACTS: ESTABLISHING PARTNERSHIPS WITH SMALL-SCALE FARMERS

One of the main objectives of the project was to work directly with key partners in Honduras (Chocolats Halba buys from APROCACAHO) and have a direct link with small-scale producers. It has been a challenge to implement coordination mechanisms in order to help the producers achieve a certain level of quality. One of the main issues was that cocoa farmers were very poorly organized, and sold their cocoa to intermediaries with few quality checks. Making sure that farmers are better organized so that volumes can be consolidated and quality checks built into all aspects of production, in particular the drying and fermentation stage, is critical. Small-scale producers bring the cocoa beans to the cooperative, which typically has a collection centre, where the cocoa beans are fermented and dried while being constantly monitored for quality. The cocoa is then transported directly to APROCACAHO's central warehouse. Since Chocolats Halba cuts out intermediaries and works directly with the cocoa farmers and their associations, they benefit from fair prices and a long-term business relationship. Those farmers who are part of the contract scheme are also trained (through farmer field schools), assisted in setting up infrastructure and given microcredit for reforestation. It is expected that the lessons learned from this project will be transferred to other places, helping to meet the huge long-term demand for organic cocoa (Coop, 2011). This model is somewhat different from other CF experiences, because it is essentially a project with diverse partners involved (i.e. NGOs, associations, research institutions, government agencies) and not only a lead firm establishing contracts with suppliers.

Contracts and coordination mechanisms (collection points and quality checks at each stage of the process) have been of great importance for farmers to have a chance to export organic cocoa. Without the existence of these contracts, exporting

to Switzerland would be virtually impossible for small-scale producers. A tripartite contract between the producers, APROCACAHO and Chocolats Halba has been signed. The contract specifies that certain quality criteria must be met for export. If producers do not reach this quality standard, APROCACAHO will still buy their cocoa, but at a lower price. Thus, there is a motivation to produce, ferment and dry high quality-cocoa beans. The post-harvest facilities have been instrumental in the development of the project. It is at these centres where Chocolats Halba monitors certain quality aspects that must be met by cocoa producers. Clear quality guidelines have been given to the producers (Table 7.2).

One of the main benefits of establishing partnerships with cocoa producers and other local actors is that Chocolats Halba, together with Helvetas and APROCACAHO, has actively engaged local producers in training courses, where the critical aspects of organic production and sustainable cultivation of cocoa are taught. By summer 2010, 150 farmers in the Patuca region of Honduras had completed a training course on sustainable and organic production of cocoa. Furthermore, there are about 150 ha of organic cocoa cultivated in this region. Because Chocolats Halba is part of Coop, one of the largest retailers in Switzerland, the Coop Sustainability Fund has been made available for this project. This fund supports and promotes innovative projects to the amount of 15 million Swiss francs a year.

Chocolats Halba has sought to establish a transparent, long-term and direct collaboration with farmers' cooperatives in three different areas of Honduras. Setting up a long-term supply chain for high-grade fairtrade and Bio Suisse-certified organic cocoa not only improves the living conditions of local cocoa farmers, but also provides Chocolats Halba with a long-term source of high-quality, sustainably cultivated cocoa. This project includes the reforestation of cleared rain forest and the use of organic, water-conserving production methods, thus helping to maintain biodiversity (Coop, 2011). APROCACAHO, because of growing demand and the interaction with Chocolats Halba, has built two processing and packing plants to export cocoa beans to Europe. The Coop Sustainability Fund has also been instrumental in the improvement of local infrastructure conducive to ensuring improved drying conditions. Greenhouses made of wooden platforms raised about a metre

TABLE 7.2
Quality requirements for cocoa beans

Quality criteria	Standard
Humidity	Max. 6.5%
Grain weight	Min. 1.05 g
Appearance	Min. 90%
Fungal rot (external)	Max. 7%
Fermentation	Min. 75%
Under-fermented (i.e. not up to standard above)	Max. 3%
Fungal rot (internal)	Max. 1%

Source: PYMERURAL, 2011.

above the ground and covered with plastic keep the beans dry and therefore they retain a better quality during the drying process.

The partnership (through contracts and interactions with the Swiss firm and local actors) that has been built up with the retailer in Switzerland has allowed these cocoa farmers to have direct access to a market that a few years ago was unthinkable for such small-scale producers. However, because APROCACAHO has signed a contract with Chocolats Halba and it exports as an association representing the producers, reaching the Swiss market has become a reality. The agreement between both entities was first established in 2009 and conditions are reviewed biannually.

7.7 CHANGING PROCUREMENT PRACTICES: CONTRACT FEATURES AND ORGANIZATIONAL APPROACH

The way of establishing contracts and agreements with different partners and entities in Honduras has been complex for Chocolats Halba and Helvetas. A contract has been established with APROCACAHO and it, in turn, works with smaller associations: Cooperativa San Fernando de Omoa, APACH, APROSACAO, Kawo Bu Kaya and Flor de los Laureles in the Mosquitia region. It is the task of APROCACAHO to manage and consolidate the export volumes required by the buyers. All the organic cocoa is stored in the warehouse provided by APROCACAHO until the export volume is reached. Keeping the product in defined locations simplifies the task of monitoring to ensure high quality. The contract specifications have been outlined by Chocolats Halba and agreed by APROCACAHO, giving the producers limited bargaining power to influence these conditions. However, APROCACAHO is the association representing the small-scale producers and thus conducts transactions in the name of the farmers it represents. Dealing with a few associations reduces transaction costs for the buyer and facilitates aspects such as communication and the transmission of codified information (i.e. contract specifications, standards and requirements) for the farmers.

The relationship established between Chocolats Halba, APROCACAHO and cocoa producers in Honduras has increased the transparency of the supply chain. The producers are paid a higher price for their product. Traditionally, this sector has paid farmers 30–50 percent of the free on board[16] (FOB) price for cocoa beans. Chocolats Halba pays 75–80 percent of the FOB price to the producers because the intermediaries are eliminated. The price paid to producers has been predefined under the terms of the contract. To establish a price, the New York Board of Trade (NYBOT) and London Stock Exchange (LSE) are used as price references and the fairtrade minimum price must also be taken into consideration, which covers producers' average costs of production. Once the base price is established, a differential for organic certification is added to this price, and producers are also paid a fairtrade

[16] Under the Incoterms 2010 standard published by the International Chamber of Commerce, FOB is an acronym for free on board, and means that the seller pays for transportation of the goods to the port of shipment, plus loading costs. The buyer pays the cost of marine freight transport, insurance, unloading and transportation from the arrival port to the final destination.

premium[17] in addition to the payment for their products. Chocolats Halba will pay producers a price above the market price. Another benefit for small-scale producers is the training they have received related to sustainable organic production and quality management.

In April 2010, and again at the beginning of 2013, several stakeholders, including producers and representatives from APROCACAHO, Cooperativa San Fernando de Omoa, APACH, APROSACAO, Kawo Bu Kaya and Flor de los Laureles were invited to visit Chocolats Halba for the official launch of the Honduran chocolate in the market. Chocolats Halba and Helvetas financed the visit, which had the goal of making all the interested parties aware of how important quality is at each and every step of the production process. They saw the whole production process at the factory, the laboratory tests that are conducted, and other quality control aspects, and were able to visit the supermarkets and retail points where chocolate is sold. The Honduran producers now have a better understanding of why quality is so important. Workshops were conducted to talk about quality and organic chocolate. They have seen where the end product is sold and who buys it. This is a distinctive type of relationship, going beyond a contract, because the producer is considered by the buyers as part of the whole process and they have developed a sense of pride in their work and product. Chocolats Halba has repeatedly stated that the Honduran producers are its partners, indicating that the relationship goes beyond buyer-supplier and a contract specifying what each party is expected to do (Fromm, 2010). For Chocolats Halba, the benefit of this project is that it is doing something in tune with its corporate values.

The investments made by Chocolats Halba, Coop and Helvetas are estimated to be over US$1.8 million. Helvetas is responsible for the administration of these funds for the development of a supply base of cocoa producers and associations in Honduras. Most of the money has been used for training purposes (including farmer field schools), strengthening the cocoa chain in the country, and helping producers comply with organic certifications (COOP, 2011).

Certifications play an important role in the modality of the contract established with the Swiss buyers. In essence, they are the core of the business relationship for the cocoa producers. Without going through a certification process, there would be no possibility for them to export to Switzerland and particularly to Chocolats Halba. Therefore, the initial phase of the project, and the actions of the supporting organizations were geared towards helping these farmers produce in a sustainable way. Another issue that is a core corporate value of Chocolats Halba is sustainability. Because the producers it procures from are located in a natural reserve area, there has been a strong orientation, if not pressure, to engage these producers in sustainable agriculture practices. With the funds provided by the Swiss organiza-

[17] The fairtrade premium is a sum of money paid on top of the agreed fairtrade price for investment in social, environmental or economic development projects, decided upon democratically by producers within the farmers' organization. The premium fund is typically invested in education and healthcare, farm improvements to increase yield and quality, or processing facilities to increase income. http://www.fairtrade.org.uk/what_is_fairtrade/fairtrade_certification_and_the_fairtrade_mark/the_fairtrade_premium.aspx

tions, five farmers' associations now have organic certifications. Standards and certifications are coordination mechanisms guaranteeing that buyers will have a product that meets very specific requirements. If producers do not comply, the agreement could not take place.

Managing a project of this nature presents several challenges. There are external factors that have to be dealt with, otherwise the success of the project could be compromised. Switzerland is not close to Honduras and, logistically, there are barriers including language and cultural differences. Communication is imperative in the success of any business relationship. Making sure that the producers understand the conditions of formal business agreements is part of the challenge. Certain complexities regarding standards are new to these cocoa producers. For small-scale producers, the risk of not complying with standards and certifications, or not fulfilling the expected volumes is high. For Chocolats Halba, securing a constant supply of high-quality cocoa beans produced under very specific environmental conditions is an even greater risk, even after establishing formal agreements with APROCACAHO and small-scale producers. The requirements that have to be met are high. Not only are certifications expected, but certain environmental conditions, particular to the region (i.e. agroforestry systems in a tropical rain forest area) must be respected.

For the cocoa producers, the stakes are equally as high. The cocoa sector in the country is just beginning to thrive, after a decade-long slump. Above all, the profits from engaging in organic production must be visible to the producers. Funding opportunities are currently at the disposal of farmers, and access to credits is possible, but the improvements and upgrading made in terms of production, post-harvest infrastructure and certifications should rapidly translate into an increased cash flow. Otherwise, the prospects of an increased income are not really obvious to farmers and the decision to engage in organic production of high-quality cocoa will be difficult to take, i.e. short-term benefits should be tangible.

7.8 CONCLUSIONS

The cocoa sector in Honduras is beginning to thrive again, after being badly affected by natural disasters, falling prices in the international market and the spread of plant diseases. The cocoa bean, that was once sacred to the Mayan civilization and has its origin in Honduras and the Mesoamerican region, can again be grown under conditions favourable to the producers and the environment in which it is cultivated. It would be simplistic to attribute the growth of this sector to the influence of a Swiss company sourcing from Honduras and establishing contracts with farmers. CF and the establishment of agreements between the cocoa producers and Chocolats Halba have played a significant role, yet essentially it is the market that is the real pull in this CF example. However, this has not been the only factor responsible for the revitalization of the cocoa sector. Rather, it has been the work of numerous organizations, both local and international, from both the public and private sector, that have worked together to support producers and the Honduran cocoa sector in particular. For increased smallholder participation in the agricultural sector, it is imperative that multiple stakeholders are involved. The increased prices paid to the cocoa farmers have helped them achieve a better income, but it has been the investment made in training (i.e. increased knowledge on organic production aspects, thus

promoting awareness about quality, agricultural practices and environmental issues) that will have the greatest impact in the future.

To date, the export volume delivered to Chocolats Halba is still low, but the potential to develop this market exists. Current trends indicate that the demand for organic products, among them cocoa, will continue to grow. Thus, for Honduran cocoa producers to remain competitive, they must keep complying with the standards and certifications that are essential for their survival. If these requirements are not met, they will have little chance of maintaining access to high-value export markets in the future. The relationship built between producers and Chocolats Halba has been favourable for small-scale farmers, as they have had to transform their production practices and upgrade their processes. They have acquired new knowledge and implemented improved practices in the drying and fermentation of the cocoa beans. This has all been because of the agreements with Chocolats Halba and the other supporting organizations. It has not been possible to set a monetary value against these gains, but they would probably be as high if not higher, than the premium prices farmers are now paid for their cocoa. The case of the cocoa sector in Honduras supports other empirical studies of how CF can be beneficial for small-scale producers in developing countries.

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Chapter 8

Contract linkages and resource use in grain production: The Argentine *pradera pampeana*

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8.1 INTRODUCTION

There are three reasons for the increased interest in contractual arrangements in agriculture. The first relates to topics such as changes in farm size, risk-transfer mechanisms, agricultural technology inflows and rural labour markets. These are all affected by different types of contractual arrangements made at the farm level. Of particular importance is the fact that factor- and product-market contracts are not independent of one another – the choice of, for example, a land tenure contract affects and, in turn, is affected by contracts made with input suppliers and output demanders. Contracts are tools for managing risk and providing incentives and, as such, have effects that cannot be studied in isolation.

The second reason is the need to explain structural change occurring in the food sector of many countries. Rural-urban migration, in particular, is resulting in changes in the nature of food chains: rapid urbanization increases the demand for transport, storage, processing and wholesale and retail distribution. Consider Brazil, where the rural population as a fraction of the total population fell from 19 percent in 2000 to 15 percent in 2011 (see World Development Indicators)[18]. Likewise, in Argentina, the rural population decreased from 10 to 8 percent in the same period. In Bolivia and Paraguay, the relevant figures were 38 and 45 percent respectively in 2000, falling to 33 and 38 percent 11 years later (ibid.). Changes such as these involve a massive shift in linkages between the food production and consumption stages. In particular, an increasingly urban population results in the development of a transport, storage and distribution system. It also results in changes in the types of foods that are demanded, in particular in a scenario of increasing incomes.

Growth in agricultural trade is the third reason for studying agricultural contracts. Since 1960, the world population has increased from three billion to more than 6.5 billion (United Nations, World Population Trends). However, trade in agricultural products has increased even more: cereals by a factor of three, fruit and vegetables by six and livestock products by nearly eight (FAOSTAT, 2013).

[18] http://wdi.worldbank.org/table/3.1

While additional trade opens up opportunities for economic growth, challenges have to be met for understanding who benefits and who loses by these trade flows. For example, current economic policy in Argentina attempts to reduce meat exports via export quotas. The stated objective is to keep prices down in order to benefit consumers. Prices paid by consumers, however, depend not only on the farm-level price of meat but also on a host of other factors affecting the meat value chain, particularly on the smoothness by which contractual arrangements are carried out among farmers, intermediaries, processors and distributors. An improved understanding of these arrangements appears to have much to offer in order to reduce the negative effects of high international food prices on domestic consumers.

This chapter focuses on contract farming of barley for beer production in Argentina, concretely in the *pampas.*[19] The chapter has two objectives. The first is to determine the importance of farm and farmer characteristics in explaining the extent to which selected contractual alternatives are chosen. As explanatory factors of contractual choice, attention is focused on farm size, farmer human capital and the pattern of production specialization. The second objective is to determine the possible impact of contracting arrangements on selected measures of input use and technology choice.

Contracting can be seen as a response to less than optimal functioning of conventional spot transactions. Forces favouring bilateral contracting may be related to asset specificity (Williamson, 1985) and need to assure product quality (Ricketts, 1994), improved coordination, protection of intellectual property, risk sharing, financing, and improved labour and managerial incentives. Different kinds of contracts can be considered as "technologies", the adoption of which results in benefits as well as costs. In particular, contract adoption may involve fixed costs and thus be affected by farm size. Adoption may also be dependent on general managerial skills and consequently on aspects such as farmer education.

8.2 BACKGROUND

8.2.1 The market for barley in Argentina

Over the last decade, consumption of beer in Argentina increased by 60 percent (INDEC, 2011). However, per capita beer consumption (41 litres/year) remains substantially below that of the United States of America (84 litres), Spain (86 litres) and the United Kingdom (94 litres) (CICA, 2011). Consumption patterns are influenced by relative prices between beer and other alcoholic beverages (particularly wine). However, the observed beer demand patterns in Argentina are also possibly a result of the comparatively lower per capita income in the country. If this is the case, an increase in beer consumption could well occur if the current trend in increased per capita income continues in the near future. An increase in the size of the domestic market could result in substantial changes in the production of barley at the farm level. In particular, as pointed out by Stigler (1951), a larger market opens up the possibility of more specialization, by both barley farmers and malt and beer producers.

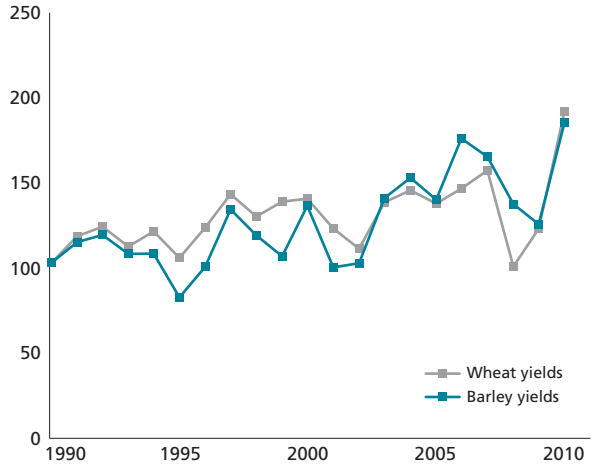
[19] The vast grassy plains of southern South America, especially in Argentina.

Cereal and oilseed production technology in the *pradera pampeana* (pampean prairie) region shares similarities to that employed in comparable areas of the United States of America, Canada and Australia. Argentine crop production, however, has some differences from these countries. In particular, in Argentina, a smaller share of total labour input is supplied by family members – hired labour is comparatively more important. Preliminary evidence also suggests that *agricultural contractors* (supplying farm machinery services to landowners or to firms renting land) are of considerably more importance than in the more developed economies. These different patterns of resource use are the result of and, in turn, determine contractual arrangements at the farm level.

Contract alternatives do not occur in a vacuum but are a result of the market linking farmers with barley processors. In particular, aspects such as degree of market concentration; substitution possibilities in the production of barley *vis-à-vis* other crops; and the substitution of different barley varieties in the production of beer play a role in transactions occurring between primary producers and processors. Agricultural production in the Argentine *pampas* allows significant substitution among crops and among crops and livestock activities. Production of barley (a winter crop) competes for resources, particularly with wheat, but also with crops such as soybeans and sunflower. Substitution possibilities result in the marginal cost of barley production being closely linked to the profitability of alternative crops. Even if farmers face a single-buyer scenario, the possibilities of their being exploited are limited since they can always "exit" by allocating resources to an alternative crop.

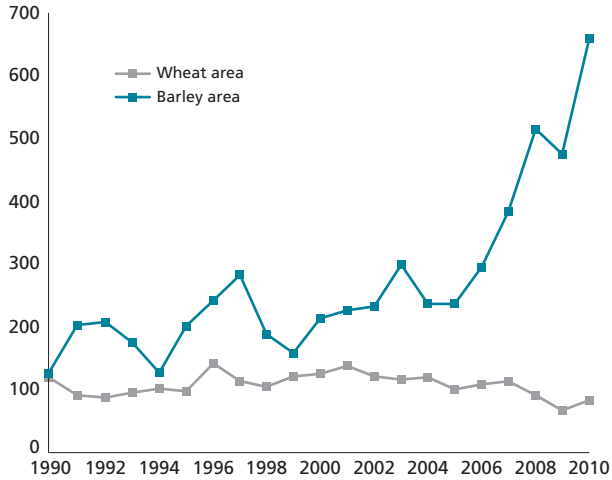
Over the last two decades, barley and wheat yields have followed the same general trend (Figure 8.1). Land allocated to barley has increased six fold, however, while that of wheat has decreased (Figure 8.2). As shown in Figure 8.2, the area

FIGURE 8.1
Wheat and barley yields



Source: Ministerio de Agricultura, Ganadería y Pesca.

FIGURE 8.2
Wheat and barley planted area



Source: Ministerio de Agricultura, Ganadería y Pesca.

allocated to barley increased slowly until 2005, and rapidly thereafter. A possible reason for this shift is the increasing regulation imposed on wheat producers, as shown by Passero (2011). From 2006, export quotas and other interventions imposed on the wheat crop resulted in wheat domestic prices some 10 percent below the equilibrium price that exporters could pay domestic producers. The result is that the domestic wheat/barley price ratio is lower than the ratio prevailing on the international market. This factor accounts for part of the increase in the barley planted area. As discussed in more detail below, growth in the barley crop has resulted in changes in the contractual linkages between farmers and barley buyers.

The domestic market for malt barley is highly concentrated. In the mid-1990s, the largest company (Cervecería y Maltería Quilmes) accounted for two-thirds of total beer production, whereas the second and third ranked companies had a share of 10 to 11 percent each. The remaining market share comes from several companies (Rucci, 1999). More recent results report a market share of 69 percent for the largest company and of 12 percent for the second largest (Ministerio de Economía y Producción, 2008). In the Argentine beer industry, mergers result in increased market power and thus increased company profits (Rucci, 1999). However, when smaller companies merge, consumers may benefit because of the reduction in market power of the largest company or as a result of operational advantages. Economies of scale in distribution and advertising are two important factors in the market power of dominant companies.

Evidence exists of the growing importance of the export market for Argentine barley production: exports increased from 15 percent of total output in 1990 to nearly 60 percent in 2009 (FAOSTAT, 2013). A barley trader explained to the author that the increasing importance of exports coupled with the high price of barley for forage is changing the nature of the malt barley market – a market with few and

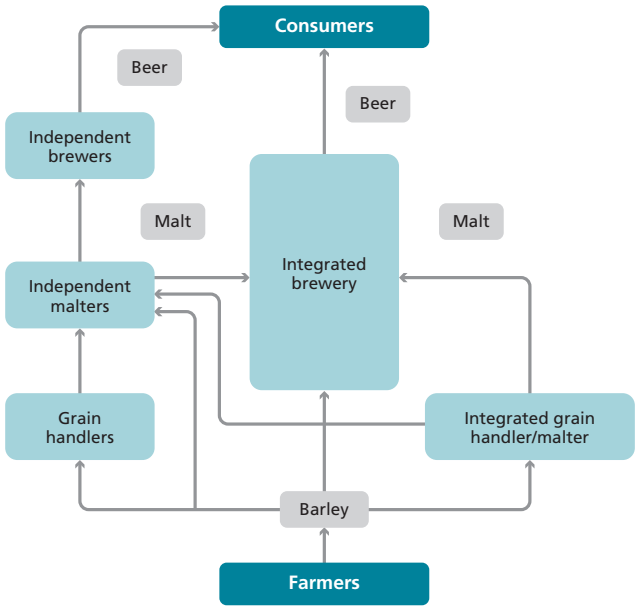
large participants may give way to a more competitive scenario (Murphy, 2011). The gradual emergence of a "price discovery" process for barley, resulting from increasing exports and competition from buyers, may result in the future in decreased emphasis on barley contracts based on wheat prices, and increased importance of spot market transactions.

In contrast with the vigorous increase in barley exports, trade in beer remains low. The "trade intensity" metric (Export + Import) / (2 × Production) has hovered around 1–2 percent over the last two decades (FAOSTAT, 2013). The price-setting process for barley, as stated previously, is thus increasingly affected by the barley trade. However, transaction costs possibly limit beer exports and imports from playing an important role. These transaction costs imply that demand for barley at the farm level will be determined by both the international price of barley and domestic supply/demand conditions of barley for the local production of beer.

8.2.2 The barley-malt-beer value chain

The barley-malt-beer value chain is a good starting-point for discussing agricultural contracts in the *pradera pampeana* region. Barley, is of course, the basic input for the manufacture of beer. The production process involves three basic stages: farm-level production of barley, production of malt using barley as an input and production of beer using malt and other inputs. The high industry concentration referred to above suggests either substantial product differentiation or economies of scale in the produc-

FIGURE 8.3
The barley-malt-beer value chain



Source: Gallacher, 2007.

tion, distribution or consumer marketing stages. Concentration also suggests the possibility of "market power", i.e. non-marginal cost pricing upstream or downstream.

Despite industry concentration, multiple alternatives exist in the beer production value chain (Figure 8.3). As compared with, for example, the wheat or maize value chain, barley production has a larger number of possible linkages between producers, on the one hand, and users of barley on the other (Gallacher, 2007). Barley – in contrast with other cereals and most oilseeds – is frequently produced under contract with malt- or beer-producing companies. A "quasi-vertical integration" (QVI) process results in users of barley contracting with producers. Contracts usually specify the type of seed to be used, quantity and type of fertilizer, weed control strategies, timing of harvest and other aspects. Agronomic advice or monitoring is included in the contract terms. Contracts usually also specify an output price for producers, taking (harvest time) wheat price as a reference, wheat being the main winter crop that competes with barley for land.

As shown in Figure 8.3, the extent of market transactions varies substantially. On the left of the figure, it can be seen that beer reaches consumers after market transactions have taken place between barley producers, grain handlers, malt-producing firms, beer-producing firms and distributors/wholesalers and retailers. The middle "path" of the figure shows QVI between malt and beer production: one market stage is eliminated. In turn, the path on the right of the figure shows QVI occurring in the grain handler/malt-producing stage. Here, a large multinational grain trade company (Cargill) vertically integrates forwards in order to sell malt instead of barley grain.

The existence of contracts between farmers and downstream market participants has sometimes been rationalized in terms of industry concentration or "market power". In the case of Argentina, mergers occurring in the beer industry have been shown to increase profits of the merged company above the sum of profits of the pre-merged companies Consumer welfare losses have resulted (Rucci, 1999). Despite the above, it is not clear what these changes in industry structure imply for primary producers since they could participate (at least partially) in the surplus transferred from consumers to the production sector.

If farmers are paid a barley price that only covers opportunity costs, rents are captured entirely by the manufacturing stage. Producers are then not "worse off" by participating in the beer production process, but they are not "better off" either. However, another possibility is that some portions of rents (understood as returns over opportunity costs) are transferred from the manufacturing to the primary production stage. Indeed, the theory of "efficiency wages" argues that companies may choose to pay salaries above those necessary to recruit workers (Milgrom and Roberts, 1992; Ricketts, 1994). The somewhat different theory of "gifts exchange" in employment relationships (Akerlof, 1982) also results in payments above opportunity costs: by paying a "rent", companies create a reciprocity obligation in employees. This concept may well apply to vertical linkages between the agribusiness and farm sector – farmer "loyalty" to agribusiness firms may result from prices paid in vertical transactions that are somewhat above strict opportunity costs.

Rent payment to employees (or in this case to farmers producing barley) can be justified by pointing out that contracts between farmers and barley purchasers are incomplete. In particular, procurement in a timely manner of high-quality barley requires the farmer to supply (partially unobservable) "effort". The probability that

this effort will be forthcoming will increase if the farmer receives a payment covering not only opportunity costs but also a rent. This rent constitutes the incentive for contract compliance. If only opportunity costs are offered, farmers perceive no cost in shirking since they always have a fallback option of producing conventional crops free from contractual obligations.

8.3 COMPETITIVE MARKETS, CONTRACTS AND NETWORKS

Market prices are *the* relevant variable in competitive markets. As pointed out by Hayek (1945), prices summarize the workings of an economic system and economize on the need to gather complex and frequently conflicting information. By contrast, contracting results in a dampened (competitive) price-setting process. Moreover, contracting frequently replaces the one-dimensional setting of competitive markets (where exogenous price is the principal variable) with a multidimensional scenario where in addition to exchange prices, other requirements (complex quality standards, timing patterns, constraints on information disclosure, labour and agricultural input standards) have to be met.

Decision-making based on prices contrasts with situations where exchange takes place under constraints resulting from contracts. These constraints may transfer decision authority either away or alternatively towards the farm unit. For example, egg producers under contract with a large agribusiness firm receive feed, animal stock and veterinary expertise as part of the deal. In a sense, these producers are not independent entrepreneurs but may be seen as (piece-rate) "employees" of the agribusiness firm. As compared with the situation where they produce the same output but without a contract, scope for individual decision-making has been reduced.[20] On the other hand, farmers engaged in producing commercial seed for a seed company, or "vertically integrating" by investing in an on-farm storage facility have additional decision-making challenges over and above those of farmers simply selling their output to grain handlers. Contract choice, in short, may either reduce or expand opportunities for exercising decision-making discretion.

Characteristics of the asset subject to exchange determine contract choice. Exchange involving non-specific assets such as grains of cereals or oilseeds do not benefit from contractual protection other than that provided by "classical" contracting arrangements (Williamson, 1985). In contrast, exchange of assets characterized by specificity will benefit from more detailed contracts. In the absence of these, recourse may be made to "relational" contracting, whereby parties rely on reputation and rents from repeated interaction.

Increased decision-making skills may result in a shift from simple to more complex contractual arrangements. For farmers, the relevant choice may therefore not be between "producing wheat" or "producing green peas" but between interacting via spot markets (the case of wheat) or, alternatively, interacting via more complex contractual forms. Indeed, the acquisition of knowledge regarding agronomic practices of one crop versus another may be of secondary importance as compared with the acquisition of knowledge of one contractual environment versus another. In

[20] However, if contracting allows an increase in output (resulting, for example, from expanded operations through financing provided by the agribusiness firm) decision-making scope may well increase.

other words, wheat farmers attempting to produce a higher-value crop (green peas) may find it easier to learn green-pea production technology than the contractual subtleties and alternatives for the marketing of peas as compared with the more simple (spot price) wheat.

The adoption of certain contractual forms may thus be compared with the adoption of production technologies. Decision-makers with higher skills may adopt earlier or, to a larger extent, potentially profitable but relatively complex contractual arrangements. As stated by Schultz (1975), human capital (both acquired in formal schooling and as a result of learning-by-doing) is crucial for improving decision-making capabilities – contract choice may well be an arena over which these decision-making skills are exercised.

Contract adoption is also a function of the potential volume of transactions to be channelled through the contract. The reason for this is that both *ex ante* and *ex post* per unit contract costs are a decreasing function of contract volume, i.e. fixed costs are involved in contracting. These may take the form of search costs, compliance with production technology standards, provisions for contract non-compliance, etc. Indeed, for large agribusiness firms, volume transacted with individual suppliers may be a crucial aspect determining the cost of inputs used in the value chain.

Output contracting alternatives include the use of futures and options (F&O), farmer group sales and different vertical coordination arrangements. Although F&O transactions are impersonal, they involve time-dependent contingent obligations. By contrast, group sales and QVI constitute personalized arrangements involving a greater number of dimensions than F&O and (particularly) spot transactions. These dimensions may include input use requirements, agreements for outside monitoring, alternatives for contract termination and arrangements for the use of loaned assets. Group sales and QVI may thus require more complex implicit or formal contractual arrangements. For these alternatives, relational contracting may be of particular importance.

Input interface alternatives include spot market purchases, farmer group purchases and different vertical coordination arrangements with input suppliers. Again, the extent of contract commitment increases when moving from spot purchases to group purchases and to QVI.

8.4 EMPIRICAL ANALYSIS

8.4.1 The barley contract

A contract linking barley producers with purchasers results in the following constraints to participants.

- Seed is delivered to the farmer, to be paid for in kind at the ratio of 2 kg of grain for every kg of seed received. The farmer is under obligation to deliver crop production resulting from the seed contract. This obligation is enforced more by reputation than by strictly legal procedures.
- Different pricing alternatives exist; however, the bottom line is that the price paid for barley is a weighted average of the export price for wheat (minus export taxes) and the prevailing price of wheat in the spot market. Prices may be locked in during the growing season: up to 20 percent of agreed production may be sold six months prior to harvest or later, four months prior to harvest or later up to 50 percent may be sold.

- Discounts (premiums) are charged (paid) according to a detailed schedule that takes into account: (i) germination; (ii) moisture; (iii) protein; (iv) grain size; (v) damaged grain; and (vi) inert matter (dust, straw, etc.). The price paid increases with the protein content, reaching a maximum for protein content ranging from 10.5 to 12 percent and decreasing thereafter. The schedule of price discounts/premiums is available prior to contractual commitment.
- In some cases, barley purchasers finance part of the fertilizer and agrochemical inputs used by farmers. If this occurs, farmers are required to purchase a hail and frost insurance policy endorsed by the barley purchasers.

The agreement is thus basically a contract where price is contingent on the price of a substitute crop for which a vigorous spot and futures market exists. Clauses incorporated in the contract result in an obligation of the purchaser to pay a higher price in the case of premiums, and the option to pay a lower price in the case of discounts. If the barley is below a certain standard, the purchaser is freed of contractual obligations.

As mentioned above, contractual compliance between farmers and barley purchasers rests largely on reputational factors. Contracts are also "self-enforcing" in the sense that rents from non-compliance are possibly quite low, both for the farmer and for the barley purchaser. There exist, however, private mechanisms to settle possible disputes. An important institution is the Cámara Arbitral (arbitration chamber), a grain inspection and arbitration service organized by private grain exchanges located in several cities. The oldest of these (Cámara Arbitral de la Bolsa de Cereales de Buenos Aires) has been in existence since 1905. The procedures of the Cámara are quite detailed. They include not only (binding) arbitration but also mediation, quality control and other aspects. Arbitration procedures (in contrast with commercial law) are extremely agile and, moreover, results from this private arbitration can be enforced through the normal judicial process.

The existence of the Cámara institution is of considerable importance as a facilitator of exchange. It is possible that its mere existence in some cases deters opportunism. In particular, and as pointed out by Williamson: "…contractual disputes and ambiguities are more often settled by private ordering than by appeal to the courts – which is in sharp contrast with the neoclassical assumptions of both law and economics" (Williamson, 1985, p.10).

What is achieved by contracting that cannot be achieved by spot transactions? Price premiums and discounts such as presented here for barley do not explain *ex ante* contracting between farmers and barley purchasers. Indeed, spot transactions usually include this type of clause. Farmers selling wheat to a grain elevator will receive a price that is contingent upon aspects such as moisture content, inert matter and other factors. Farmers only need to know the premium/discount schedule of one grain elevator *vis-à-vis* another in order to decide where to send their grain – no *ex ante* contract is required months prior to the delivery period for grain. The point made is that a *price differential due to quality* does not explain the existence of contracting in barley production.

Contracts prior to planting that exist for barley production can be explained by two factors. The first relates to the non-homogeneous characteristic of barley used for malting: barley used for beer by one firm is not a perfect substitute for that used

by another. Moreover, beer producers use certain varieties in certain proportions, thus a (partial) "lock-in" situation arises between farmers and malt producers. For farmers, this lock-in implies dependence on a given purchaser, with potential losses associated in the case of redirecting output to alternative purchasers.

The second reason is the need for brewers to reduce uncertainty with respect to total input (barley grain) supply. The concentrated nature of the demand for barley results in purchasing firms posting a price schedule, with farmers reacting to this schedule. Barley purchasers do not take prices as given, but set prices. Prices offered must of course be sufficiently attractive to cover opportunity costs (e.g. returns from barley must be at least as high as returns to wheat). If a given brewer has (i) partial monopsony power because of geographic location; and (ii) partial monopoly power because of product branding, then posted prices should maximize brewer net revenue subject to the constraint that farmer earnings are as good as in alternative production activities. In the absence of contracts, farmer expectations will lead to variation in output with corresponding efficiency losses. If output is larger than the *ex ante* optimum, farmers will lose and barley producers will gain. The opposite occurs if barley output is less than the optimum needed by malt producers. Output variability thus results in risk-adjusted net revenue loss for the value chain.

The need to reduce uncertainty mentioned above is a valid reason for contracting only if costs are associated with supply variability. This occurs, in particular, in situations where costs exist in order to access the international market. By contrast, if barley or malt exports (imports) can act as a buffer for excess supply (demand), supply uncertainty need not be a problem. A perfectly elastic demand (supply) in the world market can be accessed for selling (purchasing) barley. However, transaction costs such as export/import taxes and transport costs may result in the export market not being a perfect substitute for the domestic market. In this case, a premium is put on accurate matching of domestic supply and demand. *Ex ante* price postings by brewers contribute to this purpose.

In Argentina, production of malt as well as beer is subject to significant concentration. Five plants account for most of the malt produced in the country. Distances between malt plants of competing firms are significant – in at least one case more than 900 km. Lock-in in the barley market thus results both from malt producers demanding certain barley varieties, as well as from transport costs reducing net prices for farmers choosing to sell their output to an alternative malt producer. This lock-in is probably the most important reason for contracts being used to link farmers with the agribusiness sector.

8.4.2 Analysis of contractual patterns

Contractual patterns in three crops of the Argentine *pampas* region are analysed: "cereals and oilseeds" (C&O), peanuts and barley used as an input for malt production. Wheat, maize, soybeans and sunflower comprise what are called here "cereals and oilseeds". As a first approximation, crops included in this group are channelled through "impersonal" markets. Quality determination is relatively simple – as a class they are highly "non-specific" and thus do not benefit from personalized contractual linkages between sellers (farmers) and purchasers (grain handlers, agro-industrial buyers, the export sector). The peanut crop also shares non-specific characteristics with the C&O group, although the fact that an important part of

the output is used for direct human consumption results in quality standards (bean size, harvest methods and timing) somewhat stricter than those of the C&O group. Furthermore, peanut production requires more specialized machinery than that required by crops included in C&O.

Barley for the production of malt, and subsequently beer, is generally subject to closer specifications than the other crops mentioned. The concentrated (and "asset-specific") nature of the malt purchasing market implies that "bilateral dependence" exists between sellers (farmers) and purchasers (malt or beer producers).

The extent of contract use at the farm level has been analysed with focus on several groups of contracts. The 2002 Agricultural Census (INDEC, 2002) was used as a data source. Micro (farm-level) data from the census is summarized in Table 8.1. The following points are highlighted in the table.

Input purchase sharing. Farmers may share or pool input purchases, training services, machinery/facility use and other input procurement requirements. These arrangements necessitate considerable coordination effort on the part of participating famers. In fact, the network nature of share relationships implies lack of hierarchic discipline and an increase in the number (and hence cost) of communication linkages. As shown in Table 8.1, 8–12 percent of farmers participate in some type of input-sharing relationship. Differences in participation among different farmer groups are small but evidence exists of increased sharing in barley and peanuts as compared with C&O. These results underline the difficulties of one farmer coordinating activities with other farmers. They also show that the expected benefits of sharing activities are relatively small, otherwise sharing would be more prevalent.

Output marketing sharing. These sharing arrangements refer to several farmers coordinating the sale of their output in order to market their crop jointly. The reasons for doing this may be related to the possibility of improved sales prices, either because of better bargaining or reduced transaction costs (e.g. for transport, intermediaries). In some cases, groups of farmers jointly marketing their crop may avoid "short transport" (i.e. having to transport grain to the local intermediary instead of directly to the grain processor or the export purchaser). Results show that these arrangements are very infrequent and are used by no more than 1 percent of farmers. The frequent claims of "significant" output price differentials between smaller and larger farmers may be exaggerated since the existence of such differentials would lead smaller farmers to "join up" in the marketing of their crop.

The fact that (input and output) sharing arrangements are infrequent also points to other mechanisms that allow farmers to coordinate their activities. In particular, *firms* substitute for informal sharing or network mechanisms. Input retailers, agricultural contractors, grain traders carry out (for profit) an intermediary function that in essence results in *n* farmers coordinating activities through a single contractual intermediary. Coordination is thus not a result of conscious effort by farmers integrating a network or sharing group but by incentives leading to one firm to supply coordination services for all these farmers. As stated by Alchian and Demsetz (1972), the fact that the proprietor of this firm is the residual claimant to excess rents leads to efficiency. Network and sharing arrangements, then, "compete" with conventional firms as coordinating devices.

TABLE 8.1
Contractual arrangements

	Cereals and oilseeds*	Barley for malt*		Peanuts*	
	%	Small (20–100 ha barley) %	Large (<100 ha barley) %	Small (20–100 ha peanuts) %	Large (<100 ha peanuts) %
Farmers reporting "sharing" arrangements					
Input acquirement sharing	7.9	9.5	10.1	12.1	10.6
Output marketing sharing	0.8	0.5	1.0	0.8	2.1
All sharing	9.5	11.3	12.2	14.1	13.8
Farmers reporting "quasi vertical integration" arrangements					
With service-providing firms (seed, machinery, contractors, transport)	2.0	2.0	3.0	2.4	4.6
With agribusiness firms (cereals mills, oilseed crushers, malt barley processors)	0.9	19.4	32.9	1.8	6.7
With trade firms (seeds, agricultural chemicals, grain handlers)	1.7	1.9	4.9	1.4	5.3
All QVI	3.7	21.6	35.1	4.6	11.7
Risk management					
Insurance use	58.9	64.1	79.0	56.2	69.9
Futures and options use	9.8	8.5	19.1	7.5	18.8
Agronomic consulting/extension					
Private	68.2	68.8	81.1	66.5	76.2
Public	5.9	5.4	5.8	3.0	8.2
Cooperative	17.6	15.5	11.4	16.4	8.2
Agribusiness	1.0	0.7	0.9	5.1	2.8
Crop area (total crop ha)	**405**	**349**	**1 071**	**310**	**1 635**
Number of farms	**41 928**	**1 120**	**572**	**495**	**282**

* Farms included in the sample: 50 ha or more of crops and with less than 5 ha of barley or peanuts.
Source: computed from Censo Nacional Agropecuario 2002 (INDEC, 2002).

Quasi vertical integration (QVI). As defined here, QVI includes formal or "relational" arrangements with (i) service firms (technical support, machinery, contractors, transport); (ii) agrifood industries (grain processors); and (iii) trade firms (seed, agrochemical, grain handlers). Table 8.1 shows considerable differences in QVI arrangements between farmer groups. As expected, QVI as a whole is lowest (4 percent) in the C&O group. In the case of barley, one-fifth to one-third of farm-

ers participate in these arrangements. Participation is higher for large as compared with small barley producers. For most crop/size groups, the most important QVI arrangements involve linkages between the farm and agro-industries; linkages with service or with trade firms are much less prevalent. Census data, therefore, support the notion that vertical linkages between farmers and agribusiness firms (both at the input as well as the output interface) are only justified when additional "contractual guarantees" are deemed necessary – such as in the case of barley production but not of C&O. Peanuts are an intermediate case.

Risk management. Formal insurance and the use of futures and options (F&O) markets constitute two (among many other) contractual alternatives for risk management. Results show that 55–80 percent of farmers purchase some type of insurance (insurance types considered here are hail, hail plus additional damages, multi-risk and labour liability). Clearly, insurance is a significant issue for farmers in the region. For both barley and peanut groups, insurance use appears to be positively associated with farm size. Available data only allow inferences to be made on the percentage of farmers using some type of insurance, and not on total premiums paid. However, the finding that a smaller proportion of smaller farms adopt insurance points to the possibility of higher delivery costs to these farms as compared with those of larger size. *A priori,* one would expect smaller producers to be strong advocates of insurance, given that they are more affected by production risk than larger producers. Insurance use is also more prevalent in barley as compared with peanut and C&O crops. Several reasons may account for this. Barley purchasers may require insurance as part of the contract, particularly since a significant area of barley land is located in relatively high (hail) risk production zones.

As relates to F&O, participation is low (10 percent) for the C&O group as well as for the smaller peanut and barley producers. It increases substantially for the larger producers of these crops. Risk management strategies are therefore contingent on both crop type and farm size. Census data used here correspond to 2002, only one year after abrupt changes in macroeconomic policies resulted in major devaluation, abandonment of the fixed exchange rate and imposition of export taxes for grains. All these developments had severe consequences on local F&O markets, and may thus explain low participation rates. Nevertheless, the positive relationship between (peanut and barley) farm size and F&O use is evident. Clearly, larger farmers "manage things differently" from their smaller counterparts.[21]

Technical knowledge. Over the last decades, Argentine agriculture has experienced a vigorous inflow of new technologies (Lema, 2000). Technology adoption requires significant on-farm expertise. What kind of contractual arrangements are made between farmers and those who have access to relevant expertise? Table 8.1 shows that private-sector consultants (generally agronomist advisors) are by far the most important purveyors of production knowledge. No less than two-thirds of farmers report having contact with private advisors. Again, as in the case of insurance,

[21] But note that the average size of the "small" farm group is still significant: 349 ha for barley and 310 ha for peanut farms.

available data do not allow inferences to be made on how much private consulting is used. The public extension service appears next to last in relation to farm-level advising (the last category is advice supplied by input sale firms [e.g. seed companies and fertilizer dealers]). Technical advice from cooperatives reaches 8–18 percent of farmers. Somewhat surprisingly, linkages to cooperatives are not more prevalent for barley and peanut farmers as compared with those in the C&O group. The findings reported here on the importance of private *vis-à-vis* public agronomic advisory services raise issues related to policy and, in particular, to the design of information delivery systems. In fact, they run counter to the widespread opinion that the public-good nature of most agronomic advice implies that the only way of delivering is via publicly financed endeavours.

Results from Table 8.1 show that the barley crop is by far the most intensive as related to contract use. This is particularly true for QVI arrangements between the farm and agribusiness firms: one-fifth to one-third of barley producers participate in these arrangements, against no more than 1/100 for the C&O group and 1/14 for the large peanut producers. It is of interest to examine the factors determining, for barley producers, two aspects related to QVI arrangements, i.e. what led to QVI being chosen over conventional spot market arrangements and whether QVI had an impact on input and technology choice.

In relation to the first issue, QVI arrangements are widespread. However, a significant number of barley producers do *not* participate in QVI arrangements. Why the difference? The following factors would appear to have some significance regarding the decision of the farmer and agribusiness firm to engage in some type of vertical arrangement.

- *Size of the barley crop.* Very small barley producers impose transaction costs on the agribusiness purchaser. Within limits defined by the need to diversify suppliers, this purchaser will prefer to deal with fewer as compared to more suppliers.
- *Farmer managerial skills*. The production of barley of a consistently high quality requires farmer managerial skills. These skills are also needed in order to coordinate activities between the farm and the agribusiness client.
- *Production specialization*. This may increase efficiency and thus constitutes an attractive asset in the agribusiness vertical chain.

An econometric analysis carried out by the author[22] showed that farm size (measured in hectares planted with barley) and farmer education are positively associated with the decision to participate in QVI arrangements. The number of years of schooling was also found to be a relevant variable explaining choice of contract. Whether the higher participation in contracts of more educated farmers is because these farmers are "preferred" by the agribusiness purchaser or because they have different perceptions as to the advantages of contracts are issues worth exploring in future research. Both reasons – the "supply" of contracts by agribusiness firms to a given firm as well as the "demand" for contracts by farmers can be affected by

[22] Model details available upon request.

TABLE 8.2
Input/technology use by contract choice

			Indexes of input/technology use ("No" = 100)						Consultant/extension service use (% farms)			
			All crops		Barley							
		Number of farms	Fertilizer use	AgChem use	Fertilizer use	AgChem use	No till	Technology	Private (%)	Public (%)	Cooperative (%)	Ag Industry (%)
Share	No	1 810	100	100	100	100	100	100	70	5	14	1
	Yes	233	107	121	111	112	134	116	82	10	18	2
QVI	No	1 547	100	100	100	100	100	100	67	5	16	0
	Yes	496	149	112	134	128	95	108	85	6	10	2

Source: Censo Nacional Agropecuario, 2002.

farmer decision-making skills. As regards production specialization in barley, the analysis revealed that plausibly it does not really matter to either the farmer or to the agribusiness firm whether other crop activities are carried out besides barley.

Table 8.2 presents evidence on the possible impact of contract form (farms participating and not participating in "sharing" arrangements, and farms choosing or not choosing QVI) on selected dimensions of input and technology use. The following can be noted.

Sharing arrangements. Farmers participating in these arrangements show a higher level of input use, both in all crops as well as in the barley crop. They also show a higher level of general adoption of agricultural technology. The extent to which farmers avail themselves of agronomic consultants increases when comparing farmers participating with those not participating in sharing arrangements.

Quasi vertical integration. The impact of QVI on input, technology and consultant use follows the same general direction as that of sharing arrangements: farmers participating in these contracts generally show higher levels of all variables. The impact of QVI, however, in many cases appears stronger than that of sharing. For example, fertilizer use increases with QVI to 46 percent (all crops) and to 34 percent (barley) as compared with 7 and 11 percent for farms participating against those not participating in sharing arrangements.

Higher input use for farmers adopting sharing or QVI arrangements, as compared with those not using these contracts, may be the result of (i) lower input/output price ratios for these farmers (the agribusiness firm shares part of the input cost or pays a premium price for output?); (ii) higher marginal productivity of inputs (expertise transfer from the agribusiness firm?); or (iii) lower financial or risk-related constraints for farmers participating in these contracts.

8.5 CONCLUSIONS

The design of contracts linking farmers, input suppliers and output purchasers has the important objective of increasing efficiency in the agricultural value chain. "Efficiency", as understood here, refers to maximizing the difference between the value of outputs produced by the value chain, and the costs of inputs necessary for these outputs to be forthcoming. Additional objectives such as meeting environmental standards, or contributing to increased equity may be considered when analysing value chains in agriculture. These are certainly important issues for public policy.

This chapter shows that contract use is highly dependent on crop type. For pure "commodity" crops, the use of (input or output) "sharing" (or "farmer network") arrangements is quite low. QVI, understood as contractual linkages between a farmer and an input or output firm, is also infrequent in commodity-type crops. For crops characterized by more specific quality or overall procurement standards, both sharing and (particularly) QVI arrangements are more common. Clearly, "something is going on" in the production of barley as opposed to (for example) wheat that calls for a shift from impersonal to more personalized exchange.

Contracts linking farmers producing barley with barley processors are relatively simple. Contract compliance seems to be based, at least partially, on reputational factors. Having said this, it is important to note the following. First, in many cases,

non-compliance probably does not result in large gains for the defecting party. Further study of this issue is needed but, *a priori*, it appears that alternatives open for the farmer to improve *ex post* upon the initial contract are limited. In turn, for the barley purchaser, very large downward shifts in the demand for beer would be needed for non-compliance to be a relevant option – excess supply of barley can always be exported. The second point is that a private-ordering arbitration institution has long existed to inhibit non-compliance further. The Cámara Arbitral described earlier is such an institution. Whether these institutions play an important role in agricultural development, and what public policy measures can be taken to further these institutions are issues worth exploring.

The author's research shows that QVI is more prevalent in larger than in smaller barley-producing farms. It also shows that even when controlling for farm size, farmers´ managerial ability (measured here by years of formal education) increases the probability that some type of integration will be chosen. Decision-making skills are then an important factor in negotiating and carrying out contracts. Results presented here – at least for some production activities – point to increasingly sophisticated value chains linking farmers with both input suppliers and output processors. Managerial skills are an important input for the smooth functioning of these value chains.

The evidence presented in the chapter lends support to the hypothesis that factor use is affected by contract choice. In particular, barley farms integrating activities with agribusiness purchasers show considerably higher fertilizer, agricultural chemical and general agronomic technology use than those choosing not to integrate. They also show higher use of private consulting services. Whether higher input use is a result of the decision to participate in contracts, or whether it is simply a consequence of the overall higher general ability (i.e. education) of the farm manager remains to be determined. If the former is the case, interesting issues arise. In particular: does QVI allow capital constraints (or subjective risk premiums) to be reduced, therefore leading to higher levels of input use? Does it lead to an increase in allocation efficiency, as compared with the situation where no integration takes place? Who captures the benefits of the increased efficiency: farmers, processors or consumers?

Further questions arise as to what can be done to improve the functioning of agricultural markets, and what role contracts play in this process. In this regard, both efficiency and equity dimensions are relevant. Efficiency refers to reductions in transaction costs. In turn, equity relates to how gains from trade are distributed among market participants.

Improved information on prices and contractual alternatives appear to be important for both efficiency and equity of agricultural markets. "Sunk costs" are significant in relation to the production and distribution of information. As a consequence, farmer organizations have an important role to play in acting as clearinghouses gathering information relevant for decision-makers. In fact, participants in agricultural production strongly emphasize the need to strengthen collective action at the different stages of the marketing channels. Agricultural cooperatives, non-profit organizations and, in some cases, consulting and for-profit firms can play an important role in developing linkages among market participants.

A role also exists for the public sector. However, experience in many countries suggests that significant barriers have to be overcome for the public sector to be a

relevant (and useful) player in improving the efficiency and equity dimensions of agricultural markets. In some cases, public action is hampered by a slow reaction to changing conditions, or by a mistaken definition of the priorities and problems to be solved. Furthermore, hostility to private solutions to problems has characterized public action in many Latin American countries. In particular, limits to agreements that private agents wish to enter into have been forced on market participants. In Argentina, for example, contracts denominated in United States dollars are illegal, despite the fact that many participants would find them advantageous, given the high inflation (+ 25 percent per year) existing since 2008.

Vertical linkages between farmers and agribusiness firms, as well as sharing (network) linkages between farmers themselves, allow improved financing, risk sharing and access to expertise and organizational capabilities. All of these are important for efficiency and agricultural growth. In short, the study of contracts can contribute important insights for understanding food and agriculture in the twenty-first century.

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Chapter 9

Impact of contract farming for basmati rice in the Punjab state of India

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9.1 INTRODUCTION

Basmati rice, a high-value crop, has several distinctive quality characteristics from common rice, such as superfine grains, aroma and extreme elongation. It is cultivated primarily in India and Pakistan. India accounts for about 70 percent of total output, with approximately 45 percent of the country's production being exported. The share of basmati rice in total agricultural exports doubled from 6 percent in 2001/2002 to 12 percent in 2009/2010. Basmati rice production stood at 6.40 million tonnes in 2009/2010, increasing to 7.11 million tonnes in 2011/2012.

Basmati rice is cultivated in the Himalayan foothills. *The states of Haryana and Punjab accounted for about 72 percent of its production during 2012. The* introduction of a hybrid variety such as Pusa-1121, which is relatively cheaper than the traditional varieties, led to a large expansion of the market share for basmati rice and to its great acceptability in the major export markets. The percentage share of basmati rice exports (in both volume and value) has increased to destinations in Europe, North America and Oceania, although it has declined in Asia and Africa. The Gulf countries continue to remain the major destination for exports. Saudi Arabia, the United Arab Emirates and Kuwait in particular have consistently remained large importers, and the Islamic Republic of Iran has recently joined this group. Within Europe, the major export destination is the United Kingdom. Combined shares of Asia, the Gulf and Europe in total basmati rice exports from the country stand at more than 90 percent.

Such developments on the export front can be attributed to the signing of the World Trade Organization (WTO) treaty that opened up global markets, and to shifts in global food consumption patterns towards high-value crops. Both these factors have created immense opportunities for Indian companies to venture into new production lines. On the domestic front, the emergence of organized retailing (e.g. supermarkets and hypermarkets) has introduced a structural change in the retail market. This is because the corporate sector has targeted middle- and upper-income consumers through various store formats and also the introduction of own-store brands.

In response to such market developments, rice exporters began to form alliances with rice processors in the major basmati rice growing states in the country in order to secure rice for export. A key motivation for these alliances was the fact that food

supply chains in India have remained primarily fragmented. Therefore, market agents at each level in the supply chain have established alliances based on mutual trust with their immediate upstream and downstream chain partners in order to overcome this problem (Goel and Bhaskaran, 2007).

These organizational changes leading to closer coordination in the rice supply chain were driven in part by the Land Ceiling Act of India, which does not allow agribusiness firms to own and cultivate land for agricultural production. They also received a further incentive following the liberalization of the economy in the 1990s, when several state governments began to pave the way for contract farming (CF) to be considered as a supply chain governance mode. These states introduced amendments in the Agricultural Produce Market Committee (APMC) act, helping to create a more favourable enabling environment for agricultural contracts.

Such developments encouraged the entry of corporate groups, multinational firms and other organizations into the agricultural sector, which sought different forms of vertical coordination modalities in their chains of interest. As a result, the agricultural sector has seen the emergence of integrated supply chains for several product lines. This has eased traceability and has helped to build up a competitive edge in the market, through product development and diversification as well as improved market penetration. Models have, however, varied across companies.

For example, in the rice subsector several companies have set up their own processing plants and have diversified their product portfolios to include brown, white and parboiled rice, and ready-to-eat convenience products. Others have introduced their own brands and sub-brands to match the purchase capacities of target consumers from various market segments or have begun to engage in CF in order to secure specific quality and quantities of rice, as discussed in this chapter.

Because of their specific market requirements, these companies needed to adhere to the stringent quality parameters and standards related to good agricultural practices (GlobalG.A.P.); good manufacturing practices (GMP) protocols developed by the British Retail Consortium (Vermeulen *et al*., 2006); or fairtrade norms for exports, particularly to destinations in the European Union (EU). The rice industry also witnessed a horizontal growth that has driven the existing basmati rice processing firms to scale up their operations. According to CRISIL (a Standard and Poor's global analytical company providing ratings, research, risk and policy advisory services),[23] many small firms (with an annual turnover of less than one billion rupees) have scaled up their operations to become medium sized (with an annual turnover from two to five billion rupees), while some medium-sized firms have become large sized (with an annual turnover of more than five billion rupees) over the past two years.

However, to engage with these corporate buyers, farmers are challenged by the fact that they do not always understand the intricacies of emerging markets. They may lack sufficient capital for investments required to build networks for direct linkages with export markets or organized retailers in the domestic markets, and they may not understand the need to change varieties and production practices in order to adapt to the taste preferences of consumers. Nevertheless, the availability

[23] http://crisil.com/index.jsp

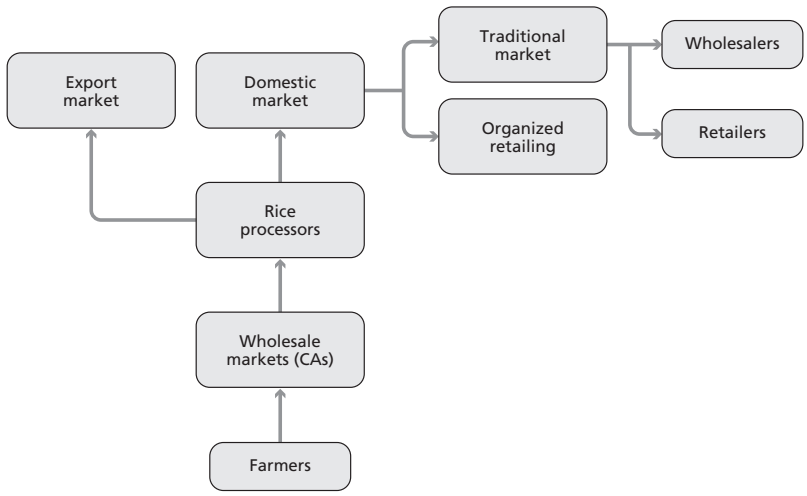
of assured markets for the disposal of a basic crop provides them with an incentive to introduce shifts in cropping patterns towards high-value crops. In this respect, CF surged as a chain governance mechanism that offered mutual potential benefits to both chain partners, i.e. farmers and rice processors.

9.2 THE BASMATI PADDY-RICE SUPPLY CHAIN IN PUNJAB STATE

The basmati paddy-rice supply chain map illustrated in Figure 9.1 indicates that farmers (both contract and independent) sell basmati paddy (unhusked rice) in the regulated wholesale food grain markets in accordance with the APMC act. They sell it through their preferred commission agents (CAs) who are the licensees of market committees. Rice processors, who may be either small- to medium-sized independent family-based firms or larger-scale companies, buy basmati paddy from wholesale food grain markets through the CAs. They send either their purchase agents/managers to these markets, who then participate in the open auctions or align directly with the CAs, specifying the quality parameters and lot sizes. These CAs operate from the markets on a commission basis, which is set by the Punjab State Marketing Board (PSMB).

The CAs provide services to farmers for the unloading and cleaning of paddy, and to buyers for crop weighing, filling and stitching of jute sacks, loading and lifting from markets. The PSMB sets acceptable charges for various services extended to both farmers and buyers. Some CAs or their extended families have set up rice shellers, so that they also act as traders. In certain states such as Jammu and Kashmir, some companies collect basmati paddy directly from farms. However, this practice does not exist in Punjab state, where contracting firms may supply

FIGURE 9.1
Basmati paddy rice supply chain map in Punjab state



Source: Goel and Bhaskaran, 2007.

inputs to farmers (particularly seeds and extension services), but have no choice but to purchase the basmati paddy produced under contract from the wholesale markets via the CAs.

The various rice processing firms can be broadly classified into three groups. The first group includes companies that have introduced their own brands and sub-brands. These have established direct alliances with either importers or leading retail chains in the export markets, but they may also pack rice for retail chains to be sold under store brands. Firms in this group strictly adhere to the buyer-specified quality parameters for basmati paddy purchase, in order to project a good brand image. To do so, the firms either enter into CF directly with farmers, such as in the case of organic basmati paddy production (in other states), or establish alliances with other firms for the purchase of paddy from wholesale markets, or else combine both practices. Partner firms also have to comply with the specified and often stringent quality parameters.

A second group includes firms that have not yet introduced their own brands. These firms adopt a flexible approach in their target market segments. Depending upon the prevailing market prices and the downstream partner firms' requirements, such firms may mix different varieties of rice (generally of inferior quality), which are then sold as a single product.

The third group includes firms that enter into exports directly, particularly when the markets are buoyant. Otherwise, these firms align either with those from the other groups or with corporate groups that have set up organized retail chains throughout the country.

Within each group, individual firms compete with each other in the wholesale food grain markets to obtain the desired lot sizes of basmati paddy. This competition has led most markets to turn oligopolistic in nature. However, entry of these firms in a particular market depends upon their plant capacity, size of rice delivery orders in the potential markets, price competitiveness, purchase taxes, volume of market arrivals and the availability of crop selection choices.

Rice processors sell basmati rice in export markets as well as to medium- and upper-income consumers in the domestic market. In the export markets, processors generally align with other firms such as importers, leading retail chains and restaurants. Export orders and quality specifications of firms vary each year, depending upon prevailing market conditions. Firms sell basmati rice in the domestic market through both organized retail stores and traditional markets that comprise wholesale and retail market segments. Firms from the first group of rice processing firms described above (i.e. own brand and sub-brands) sell branded rice in consumer packs of 1 kg and 5 kg, while firms from the other groups sell rice as a bulk product (both at organized stores and at traditional wholesale markets).

9.3 BASMATI PADDY CULTIVATION IN PUNJAB STATE

Since the post-Green Revolution period of the mid-1960s, Punjab state, representing 1.54 percent of the country's total land area, has traditionally followed a wheat-paddy rotation. This is because of the availability of assured markets for these two crops since the Food Corporation of India, together with several state-level agencies, purchases them at preannounced, government-set minimum prices for running the public distribution system (PDS) in the country.

TABLE 9.1
Basmati paddy area in Punjab state and area under contract to PepsiCo

Year	Area under basmati Paddy ('000 ha) Absolute	(%)	Shares of basmati In total rice Area	Prod	Basmati area under CF Total* Absolute	(%)	PepsiCo** Absolute	(%)
1998/99	–	–	–	–	–	–	0.13	–
1999/00	–	–	–	–	–	–	0.05	–
2000/01	104	–	3.98	1.76	–	–	0.33	–
2001/02	102	-1.92	4.10	1.85	–	–	3.06	–
2002/03	157	53.92	6.21	2.94	–	–	1.18	–
2003/04	212	35.03	8.11	3.98	36.64	17.28	3.68	10.04
2004/05	130	-38.68	4.91	1.95	40.47	31.13	2.96	7.32
2005/06	97	-25.38	3.66	1.69	17.10	17.63	3.24	18.97
2006/07	122	25.77	4.65	2.43	14.16	11.61	3.60	25.40
2007/08	144	18.03	5.52	3.02	34.01	23.62	5.61	16.51
2008/09	340	136.11	12.44	8.41	34.00	10.00	7.37	21.69
2009/10	513	50.88	18.31	12.14	30.32	5.91	7.09	23.39
2010/11	600	16.96	21.82	NA	NA	NA	NA	NA

* Shares in total basmati area; ** shares in total area under CF.
Source: PAFC, Punjab State Department of Agriculture, Statistical Abstract, Punjab.

However, from 2002 to 2003, the state government began to encourage CF for crop diversification, particularly for paddy land. The rationale was that paddy is a non-traditional and water-intensive crop, leading to a rapid depletion in the groundwater level, thus requiring consideration of alternative crops with greater water usage efficiency. Further impetus for CF in the state was driven by the establishment of the Punjab Agro Foodgrains Corporation (PAFC) in 2002. PAFC is a nodal CF agency established with incentives provided by the PSMB to reduce market and rural development fees from 2 to 0.25 percent, and to provide assurances to farmers for the buy-back of new crops at prefixed prices. Basmati paddy thus emerged as a leading crop under CF during the *kharif* (summer) season in 2002.

The total area of basmati paddy under CF has been shared by two private companies: PepsiCo and Gee Gee Agro Tech, and a state agency called Markfed (Punjab State Cooperative Marketing Federation). From 2009 to 2010, these agencies held approximately 27, 8 and 65 percent of the total contracted area, respectively. Markfed has 3 069 member cooperative societies that represent the interests of about one million farmers. As a state government agency, it has been engaged in the distribution of fertilizers and agrochemicals to farmers as well as paddy procurement under price support operations of the central government. Gee Gee Agro Tech is a private firm that had set up its rice processing plant during 2006 to 2007. Its owners also act as CAs for one of the wholesale food grain markets (Moga). The other private firm, PepsiCo, is a well-known international agrifood company and will be the focus of this case study on CF operations for basmati rice in the state of Punjab.

The total cultivated area under basmati paddy in the Punjab is made up of two components: the area under CF and the area that is cultivated by farmers based on their personal judgements of the markets, i.e. without entering into a contract with any buyer (Table 9.1). The remarkable increase in the total basmati rice area in the period considered in Table 9.1 stems from shifting land from the competing crop, i.e. non-basmati paddy.

9.4 PEPSICO BASMATI PADDY CONTRACT FARMING OPERATIONS

9.4.1 Background

The impacts of CF on basmati rice production and marketing in Punjab state can be illustrated by the case of PepsiCo, which has succeeded in linking its contract farmers to medium-/higher-income consumers in the global and domestic markets. PepsiCo had previously been engaged in CF of tomatoes and chilli in the Punjab, which had helped it to build up a farm-level network. The company entered into CF for basmati paddy in 1997/98. Thereafter, its contracted area rapidly expanded, although its share in the total area under CF has been oscillating, reaching as high as 25 percent in 2006/07 and then declining to 23 percent at the end of the observed period in 2009/10. The number of villages, as well as the farmers engaged with PepsiCo under contracts, also oscillated in the 2009/10 and 2010/11 period from 904 to 1 117 villages, representing 3 257 and 3 686 farmers, respectively. Increased land area has led to an increase in production (Table 9.2) but this growth also shows a cyclical pattern. In contrast, yields have increased more or less consistently, from 1 552 kg/ha to 2 659 kg/ha in the observed period. This has led to a sizeable increase in the volume of product reaching the wholesale food grain markets.

TABLE 9.2
Production, market arrivals and PepsiCo purchases of basmati paddy from Punjab state (in '000 tonnes; yield: kg/ha)

Year	Production		Yield		Market arrivals		PepsiCo purchase	
	Abs	Change (%)	Total	Share (%)	Total	Share (%)*	Total	Share (%)**
2000/01	161	–	1 552	–	–	–	–	–
2001/02	163	1.24	1 601	3.16	–	–	–	–
2002/03	261	60.12	1 662	3.81	–	–	–	–
2003/04	384	47.13	1 810	8.9	–	–	–	–
2004/05	204	-46.88	1 570	-13.26	–	–	–	–
2005/06	172	-15.69	1 766	12.48	214.55	124.74	5.95	2.77
2006/07	246	43.02	2 019	14.33	190.25	77.34	3.32	1.75
2007/08	317	28.86	2 199	8.92	403.11	127.16	6.56	1.63
2008/09	925	191.8	2 721	23.74	1 146.14	123.91	12.95	1.13
2009/10	1 364	47.46	2 659	-2.28	1 947.9	142.81	10.47	0.54
2010/11	NA	–	–	–	1 839.73	–	5.88	0.32

* Share in total production; ** share in market arrivals.
Source: Punjab State Department of Agriculture, PSMB.

TABLE 9.3
Total cultivated area (ha) under the major basmati seed varieties provided by PepsiCo to contract farmers in Punjab state

Variety	2006–07		2007–08		2008–09		2009–10		2010–11	
	Total	Share	Total	Share	Total	Share	Total	Share	Total	Share
160	2 856	32.12	6 001	43.26	5 715	31.36	8 892	50.74	8 057	41.13
134	3 139	35.31	4 518	32.57	7 135	39.15	5 615	32.04	7 593	38.76
135	1 036	11.65	2 511	18.10	3 129	17.17	1 239	7.07	2 044	10.43
Others*	1 860	20.93	841	6.07	2 247	12.34	1 779	10.15	1 895	9.68
Combined	8 891	100.00	13 871	100.00	18 226	100.00	17 525	100.00	19 589	100.00

* These include 106, 170, 101, 162, 1 460 and 303.
Source: PAFC.

The volume of market arrivals stood higher than total basmati paddy production for the state since 2005/06 except during 2006/07. The reason may be that higher comparative market prices in Punjab markets were attractive for farmers from the adjoining state of Haryana for the disposal of their crops. Market arrivals of basmati paddy during the 1990s ranged from about 30 to 63 percent of the total output, because millers and traders made purchases directly from farmers to evade market charges (Rangi *et al*., 2001). PepsiCo's basmati paddy purchases from the wholesale markets have not followed any singular pattern.

PepsiCo's basmati seed production farm in Punjab is in the village of Jallowal, near Jalandhar city. The company has aligned with farmers for seed production and provides several varieties of basmati paddy seeds to contracted producers. Pusa-1121 is the major variety adopted, referred to as variety 160 by PepsiCo (Table 9.3). It has a high yield, i.e. 3 700–4 500 kg/ha (initially it was 4 900–5 400 kg/ha) and its grain size is long, thick and hairless. The plant is sturdy but fungal infection can lead to crop damage of about 20 percent. The company has introduced machines for direct seed sowing and extends the use of this equipment to its contract farmers free of charge. It also bears all the incidental costs incurred with transporting the machinery on and off farm. The farmers do however purchase the seeds themselves.

The company previously had its rice processing facilities at Sonepat in Haryana state and used to export basmati rice to the Middle East. However, this plant was sold in 2003/04 to LT Foods Ltd. Since then, the company has not been engaged in direct exports of basmati rice. Nonetheless, the interest of PepsiCo in keeping its existing base of contracted farmers led to the establishment of an alliance with LT Foods Ltd (as the downstream buyer) in order to facilitate continued acquisition and sale of its contract farmers' basmati paddy. To meet its commitments, PepsiCo also entered into contractual agreements with CAs in the regulated wholesale markets. Area supervisors employed by PepsiCo act as a liaison between farmers and designated CAs for crop delivery.

LT Foods Ltd (formerly LT Overseas) had expanded its business operations from more simple CA roles to a trading firm in 1977, and entered into exports in 1980. At present, it exports basmati rice to about 50 countries. It has also developed a strong

distribution network in major cities within the country and diversified its product portfolio to cater to the taste preferences and purchase capacities of target consumers in the various market segments. Its portfolio includes brown, white, parboiled and organic rice, as well as value-added convenience products. Under its flagship brand DAAWAT, the company has introduced several sub-brands.

To guarantee its procurement needs, PepsiCo has aligned with farmers (directly and indirectly (i.e. through other firms) to source basmati paddy of the requisite qualities and varieties in its desired lot sizes. Quality specifications are conveyed to its contract farmers and partner companies through recommendations regarding seed varieties and technical advice on the use of pesticides. Company agents liaise with farmers for the delivery of basmati paddy to the wholesale markets, but farmers are responsible for conveying the crop from the farm to the markets, where it is cleaned and filled into 50-kg jute sacks. PepsiCo then purchases this paddy through its designated CAs in the wholesale markets, ensuring that paddy purchases are in strict accordance with the prescribed quality specifications. LT Foods Ltd supplies jute sacks to PepsiCo for packaging the paddy and arranges for delivery directly to the plant premises from the markets.

9.4.2 Study location

PepsiCo entered into CF operations with farmers from 19 districts in the Punjab during the *kharif* season of 2010/11, representing 1 117 villages and 3 686 farmers. However, its major regional focus remained in Hoshiarpur and Jalandhar districts, which accounted for 71 percent of the company's total area (7 927 ha) under CF.

For the purpose of this study, one leading block that occupied the highest area under CF was selected from each district. These were Bhogpur block (1 398 ha) from the Jalandhar district and Dasuya block (765 ha) from the Hoshiarpur district. A sample of 15 contract farmers registered with PepsiCo was taken from the villages surrounding the wholesale food grain markets closest to each sample block. A sample of 20 basmati paddy growers (those who cultivated the crop independently based on their own decisions, i.e. not contract farmers) was also selected for comparison. These farmers (ten from each area) belonged to the traditional basmati-growing belt of Amritsar, i.e. the villages surrounding Amritsar wholesale market and the Rayya wholesale food grain market. Rayya has recently emerged as a major wholesale market for basmati paddy, with a large number of farmers from its surrounding villages recently shifting to basmati cultivation.

Personal interviews were held with these farmers at their homes to discuss their involvement in CF or independent farming for basmati paddy production. The General Manager, as well as field supervisors of PepsiCo and CAs from the sample wholesale food grain markets, were interviewed at their business premises. Sample CAs included those designated by PepsiCo (in the Dasuya and Bhogpur markets) as well as those who dealt with other firms that entered the markets as independent buyers or established alliances with them (in Bhogpur, Amritsar and Rayya markets). Telephone interviews were held with the General Manager of LT Foods Ltd. Information obtained from various market agents in the entire supply chain related to the *kharif* marketing season 2010/11.

9.4.3 Contract farming characteristics

PepsiCo signs formal written agreements with its contract farmers. These contracts spell out: the area to be sown under basmati paddy; varieties to be planted; basic contract prices for selling basmati paddy to the company; purchase policies; payment terms; responsibilities of each party; conditions for non-compliance with contracts; and contract termination. A unique feature of these contracts is that farmers are free and have the right to sell their crops to other firms if the prices offered by the company in these contracts are not up to their expectations or fall below the market price. This feature represents a direct adaptation by PepsiCo to the enabling environment whereby government regulations stipulate that farmers must be allowed to realize higher returns when market prices are higher than contractual prices.

The company supplies contract farmers with quality-assured seed varieties that are booked each year during the months of April/May, i.e. prior to the commencement of crop sowing. They must be paid for and collected from seed stores located in the wholesale markets. Seed requirements are booked by telephone or through the company's designated CAs or field supervisors. In the Dasuya block villages, the company has only recently entered into CF. Previously, innovative farmers sourced improved seeds from the Bhogpur wholesale market, which is about 30 km away. Ease of access to seeds has therefore been an additional motivation to draw several farmers to the PepsiCo CF operation in Dasuya.

PepsiCo issues booking slips to farmers that indicate block and village names, areas to be sown to specific varieties and a farmer's code. New codes are issued each year to farmers, because not all contracts are necessarily renewed; new farmers can also enter into contracts. Indeed, contracts are not renewed if farmers fail to sell their crops to PepsiCo. The company opens seasonal seed stores (around mid-May to mid-June) in the sample wholesale food grain markets. Farmers are required to make full advance payments (one to two days before pick-up) either by cheque or by a demand draft in order to purchase seeds from the company.

Field supervisors provide requisite technical training to the contract farmers for basmati paddy cultivation free of charge. Emphasis of the training is on seed treatment to reduce fungal infection and other diseases, nursery raising, field preparation, transplantation, top dressing, pest control, drainage, paddy harvesting and threshing. Farmers are expected to adopt the company-recommended packages and practices, and adhere to its quality parameters. Field supervisors maintain farmers' diaries and keep complete records of the various field-level practices from crop sowing to harvesting, as well as the quantities and timings of various operational inputs. They visit the contract farmers regularly, although they cannot always provide ready solutions to all field-level problems. Based on their experience and through cooperation with fellow producers, farmers also seek solutions to their problems through trial and error methods.

The company provides specification sheets of the stipulated quality parameters for the purchase of paddy. These relate to moisture content (17 percent), admixture with other varieties (6 percent), grain damage/discoloration (5 percent), red grain (1 percent) and broken grains. However, the requirements for moisture content, grain damage and broken grain is 1 percent higher for basmati paddy, which is mechanically harvested with combine machinery. PepsiCo advises its farmers to practise manual harvesting and fixes its purchase price higher (Rs150–200/100 kg)

compared with products harvested with combines. This is because of the lower moisture content associated with manual harvesting that helps to reduce rice breakage during milling and increases head rice recovery.

All farmers (both contract and non-contract) are required to transport the crop to the wholesale food grain markets, either by bringing it themselves or through hired labour, using their own tractor trolleys. Marketing takes place in a post-harvest period of about two months from mid-October to mid-December. Since farmers deliver the crop to market directly from the field, it is cleaned in the wholesale market before the auction, a condition that can create opportunities for unfair practices by the CAs. Farmers are required to pay the CAs for their cleaning services at a rate fixed by the PSMB, yet not all CAs provide good sieves during the cleaning process, which provides an opportunity for connivance with cleaning workers, who may appropriate some of the grain passing through the sieves. All basmati rice (contract and non-contract) is sold through the auction system and can only be purchased by the CAs who charge a commission rate of 2.5 percent as set by the PSMB.

PepsiCo links its purchase price of basmati paddy with the prevailing market prices in the major wholesale markets in the state of Punjab. Revised prices are announced every evening during the season. The company's basic contract price at the time of this study stood at Rs1 200–1 300/100 kg, whereas its purchase price actually varied from Rs1 600–2 400/100 kg for the Pusa-1121 variety. The (non-contract) market price of the Pusa-1121 variety ranged from Rs2 200–2 500/100 kg in the major wholesale markets and from Rs2 000–3 100/100 kg in the Amritsar wholesale market. The CAs reported that the market prices of basmati paddy used to fluctuate by Rs50–100/100 kg in previous years, whereas these fluctuations have magnified to Rs400–500/100 kg at present, highlighting the strong demand for basmati and competition among buyers.

PepsiCo purchases all lots of basmati paddy (its rejection rate is only 5–8 percent) from the contract farmers who transport it from villages located within a radius of 15–20 km from its selected wholesale markets. The company also provides an incentive/subsidy in transport costs for those farmers who deliver from further distances, i.e. Rs10/100 kg to farmers who deliver from 25 to 30 km away and Rs20/100 kg for a distance of 30–40 km on top of the purchase price. The number of farmers who delivered basmati paddy from these distances to the Dasuya market were 700, 30 and ten, respectively. Of the total basmati paddy procured from farmers, the shares of those who harvested manually and with combines were about 88 and 12 percent, respectively. Farmers tend to hold on to their crop supplies when they expect prices to rise during lean periods. For example, several farmers from Dasuya block had stored their crops even though they failed to sell them at higher prices because of discoloration during storage.

A large majority of farmers from both these areas retain a percentage of good-quality crops as seeds for the next growing season. Farmers who do not retain seeds from their own crops have to purchase either from open markets, from fellow producers or from the Punjab Agricultural University. The university however can only provide seed for about one acre (0.4 ha), which then has to be multiplied at the farm level.

9.5 CONTRACT FARMING ASSESSMENT

9.5.1 Characteristics of sample respondents

Several farmers from the adjoining villages of the Bhogpur wholesale market reported that they had entered into CF for basmati paddy with PepsiCo since 1998–99, as they had previously been associated with the company for other crops. Some of these farmers had also gradually extended the area under basmati paddy cultivation after observing and understanding the dynamics of prevailing markets for this crop. The continued commercial relationship with the firm suggests that CF remains an attractive alternative to independent production.

With regard to their demographic characteristics, sample farmers (contract and non-contract) belonged to a wide age group, ranging from 30 to 65 years of age, with the great majority between 40 and 60. Schooling ranged from illiteracy to post-graduation, but for the majority it consisted only of elementary education. All sample growers farmed their own land, but some took in addition land on lease for cultivation from their close associates, including extended family members, neighbours who were not engaged in farming because they were non-resident Indians, or others engaged in the services sector. The farm businesses were either inherited or self-started, and were run individually with family support and the assistance of hired labour (both permanent and temporary) in the various farm-level manual operations. On the whole, producers owned farm machinery and equipment and had long-term experience at the farm level.

9.5.2 Benefits for contract farmers

All sample farmers (contract as well as independent) reported that basmati paddy cultivation compared with non-basmati paddy cultivation provides them with several benefits. These include fewer irrigation applications because of the late sowing period and less fertilizer consumption. However, consumption of pesticides is comparatively high, because after harvesting of non-basmati paddy in surrounding areas, parasites shift to the basmati crops. On average, the total cost of cultivation is about Rs5 000 lower per hectare when compared with non-basmati paddy, but for producers lacking proper farm level supervision, deterioration of the quality of basmati paddy may occur. Among other reasons, this results from mixing up seedlings of basmati with non-basmati paddy through ignorance, and from the crop lying down during excessive rain.

As regards prices, contract farmers reported that in the past they were paid for crop sales only at the company fixed basic price, both in the Dasuya and Bhogpur markets, even when higher market prices prevailed in other wholesale markets in the state. However, this practice was changed in the 2009/10 season when PepsiCo introduced the daily market pricing system. Net returns in the 2010/11 crop marketing season from basmati paddy cultivation were Rs74 000–86 000/ha, which is higher than returns from non-basmati paddy, estimated at Rs64 000–74 000/ha. Nevertheless, annual returns vary because of volatilities in market prices that depend heavily upon the prevailing demand conditions. For instance, net returns had escalated to Rs148 000 to 173 000/ha during 2008/09 because of buoyancy in market demand. The returns for contracted against non-contracted basmati farmers showed little difference in both areas investigated, hence the primary benefits for contract farmers are the availability of high-quality seeds, the provision of free

technical advice and the assurance of minimum fixed returns, particularly in non-basmati-producing areas.

Independent farmers (i.e. non-contract) prefer to sell basmati paddy in the major wholesale grain markets located in the major cities at district level. In these markets, the presence of various sized firms from within the state as well as the adjoining states of Haryana and Delhi pushes up total demand and creates demand for all lots regardless of quality. This results in an array of price determinations for each lot depending on its crop quality. Prices of the superior lots are pushed up, demand is also available for rejected lots, and prices of intermediate-quality lots are determined on each market day by the prevailing demand and supply situations. This provides an incentive to farmers to improve crop quality at the farm level if they wish to enhance their returns from crop sales, yet they also know that a secure market exists for all crop quality levels.

By contrast, all contract farmers whose crops meet the PepsiCo minimum specifications obtain the same price on each market day. However, a key strategy of the company is to partner with small- to medium-sized farmers in the non-traditional basmati paddy growing areas, as they generally prefer to transport the crop to the nearby wholesale grain markets. This is because transport to distant markets not only adds to transit costs but also requires more time and they have to sell through unknown CAs with whom they have no prior relationship. The additional benefits provided by the contract such as access to seeds, technical support and subsidized transport costs depending on distance to market, help to offset any price differences that may be associated with delivering to the major wholesale markets.

9.6 RECENT MARKET DYNAMICS AND IMPACTS

9.6.1 Competition issues affecting farmers under contract

PepsiCo is the only company that purchases basmati paddy in the Dasuya wholesale food grain market. Since the small size of the market does not attract competing companies, it effectively remains a captive market for PepsiCo to source its supplies. Although in principle the firm allows farmers to sell outside the contractual bonds, the fact that this is an effective monopsony reduces the opportunities for side-selling as there are limited alternatives for farmers.

With regard to the Bhogpur wholesale market, deliveries of basmati paddy have rapidly increased in recent years because of a number of factors. These include the expansion in cultivated area under this crop in surrounding villages, and the increased deliveries from independent growers (from various distant growing areas) who used to deliver the crop to other wholesale markets such as Phagwara and Rayya. The volume of market arrivals of the crop in this market has increased (Table 9.4) from 80 673 quintals during 2008/09 to 100 832 quintals during 2009/10.

The larger supply availability attracted several regional- and national-level firms to this market, with each firm adhering to its own specifications for quality. These companies compete for the purchase of basmati paddy of various quality levels that range from the rejected lots from PepsiCo, to those considered superfine. Hence, increased market demand pushes up market prices for superior quality lots that deliver greater returns to farmers on the one hand, yet the firms also focus on different market segments that allow producers to dispose of inferior lots on the other. For example, several companies such as KRBL, DCNK and Naranjan Exports

TABLE 9.4
Basmati paddy purchases (quintals) in Bhogpur wholesale market, by firm

Firm	2008–09		2009–10	
	Absolute	Shares (%)	Absolute	Shares (%)
PepsiCo	40 813	50.59	36 946	36.64
Sunstar Overseas	18 482	22.91	22 853	22.66
Bhagwati Lacto Vegetarian (BLV)	–	–	10 849	10.76
Duli Chand Narender Kumar (DCNK) Exports	–	–	10 043	9.96
BP Agro Foods Pvt Ltd	–	–	9 414	9.34
KRBL	20 952	25.97	6 349	6.30
Others	426	0.53	4 378	4.34
Total	80 673	100.00	100 832	100.00

Source: Market Committee, Bhogpur.

purchased basmati paddy at prices that were higher than those paid by PepsiCo. This is beneficial for farmers who, depending upon lot sizes and crop quality, can realize higher returns as well as dispose of all grades of their crop. However, for PepsiCo this creates greater risk to their CF investment.

To cope with growing competition in this market, PepsiCo has repositioned its purchase strategy. The company has established an alliance with a CA in the nearby small wholesale food grain market of Ladhra. This market provides a locational advantage to its contract farmers who are located in villages in the immediate vicinity. As the market does not attract other firms for purchases, PepsiCo succeeds in acting as sole buyer. Its client farmers who deliver their crops to this market gain by saving time and transport costs, thus helping both chain partners to sustain their mutual long-term business interests. Nevertheless, contract farmers with comparatively larger lot sizes of marketable surpluses usually prefer to deliver their crops to Bhogpur wholesale market for quick disposal. Some farmers from these villages sell their crops to PepsiCo (70–80 percent) as well as other companies (20–30 percent). They do so particularly when seed germination is good, market prices are high and CAs (with whom farmers have long business relationships) persuade them to sell the crop also through them. CAs from the Ladhra wholesale market who purchase/handle PepsiCo's rejected lots usually pool and deliver these either to the Bhogpur wholesale market or to a mill premises.

9.6.2 Competition issues affecting independent farmers

As indicated previously, sampled farmers in this group bring their crops to the Rayya and Amritsar wholesale grain markets. Farmers from the surrounding villages of Rayya wholesale market reported that before the development of this market they used to deliver their crops to Amritsar, Tarn Taran and Kapurthala wholesale markets. With increased market arrivals, Rayya started to attract several firms. Increased demand started pushing up market prices. This provided an incentive to existing farmers (as well as new growers), who responded by extending the area under basmati paddy. Hence, an increased volume of market arrivals during

each successive round (for the last five to six years) has rapidly expanded the market size (from 300–400 quintals to 40 000–50 000 quintals per season) for this crop in the Rayya wholesale market. Although prices have become more attractive to farmers, the increased volume of transactions has created logistic inefficiencies that have negatively affected farmers. Indeed, farmers reported that they sometimes have to wait two to three days for crop disposal.

Amritsar is a mature market for basmati paddy that remains operational throughout the year. Prices of basmati paddy generally move closer to the patterns of export prices of rice, as several rice processing firms targeting international markets are located in the city. These firms export either rice directly or have aligned with exporters located in the metropolitan cities of Delhi and Mumbai. The linkage with international markets provides incentive to growers to build up paddy stocks and release products gradually as prices start going up. In this market, some CAs who deal with rice companies also hire purchase agents. They visit the market, identify the lots that conform to the client company's purchase specifications, participate in auctions and purchase the crop on its behalf. Sometimes CAs act as traders and buy the crop themselves, particularly when market demand is dormant, and they sell later when prices go up.

In short, because of current market conditions and increased demand for basmati paddy for domestic and export consumption, independent farmers have no shortage of options for selling their product, so that market access is not a concern. However, while they may have greater flexibility to choose which market to supply to and whether or not to store their paddy with the hope of achieving higher prices, the evidence found in the present study does not show indications of the exercise of monopsony power in the contractual operations of PepsiCo. This is primarily because even those farmers under contract have the option to sell part or all of their production to other companies if they so choose, yet doing so will result in a loss of contract renewal options for the following season. In addition, there are other financial and non-financial benefits available for farmers under contract that may help to outweigh the potential for a slightly higher market price outside the contracting system. These include prompt payment; pricing incentives for manual harvesting; subsidized transport costs depending on distances to market; access to superior quality seeds; and technical assistance, none of which are available to independent farmers.

9.6.3 Payments to farmers

It goes without saying that farmers prefer prompt payments from their crop sales, since they have to make payments for hired labour, repay bank loans and meet other financial needs. PepsiCo makes prompt payments to its contract farmers, with accounts typically settled within a week, even though the stipulated time in the contracts is ten to 12 days. Money is transferred electronically to farmers' accounts. While some farmers from Dasuya block reported that sometimes payment is delayed for a month or two, this seemed to be more an exception than the rule. This happens particularly during a situation of local-level dispute that requires prior approval from the company. Indeed, despite the fact that PepsiCo may receive payments from basmati paddy sales to LT Foods Ltd quite late, the company has earmarked a separate fund of Rs300–400 million for making payments to the farmers on time. This is another added incentive for farmers to participate in contracts with the company.

As stated previously, there is no legal binding on contract farmers to sell their crops to PepsiCo – they are free to sell them anywhere on the market. However, it is legally obligatory for the company to purchase the crop from farmers if the market price falls below the company fixed basic price, otherwise farmers can take PepsiCo to court for damages.

In the case of independent sales, several companies such as KRBL, Sunstar Overseas and Bhagwati Lacto Vegetarian (BLV) generally make prompt payments in other markets. However, companies such as BP Agro Foods Pvt Ltd and Dulina have delayed payments to farmers for anywhere between three to six months. When this happens, CAs have to make payments to farmers by either raising bank loans or personal loans from friends and relatives. Eventually they may divert their client farmers' funds (sometimes farmers deposit money from sales proceeds with CAs for safekeeping) or sell family assets. However, CAs generally make timely payments to the client farmers, even if these are made on a piecemeal basis.

As the increased supplies of basmati rice to export markets have led to stiff competition, exporters have increased the credit period from 15 to 30 days, to 90 days. Hence, several companies delay payments to the CAs and they in turn pass these on to the independent growers. This increases the interest cost liability of a company and squeezes its profitability and therefore its capacity to face business exigencies. According to CRISIL, basmati players continue to rely partly upon short-term debt (which is extinguished once inventories are liquidated) and partly upon credit from wholesale markets for paddy purchases.

Both contract and independent farmers usually tend to shift back to non-basmati paddy cultivation if they fail to receive timely payments. The reason is that non-basmati paddy is harvested with combines, which saves labour costs, and CAs tend to make payments within about three days of sales for non-basmati paddy, since it is purchased primarily by the government.

9.7 CONTRACT FARMING AND EXTERNAL FACTORS

Several external factors can impinge upon the basmati rice subsector. As an agriculture commodity, it is highly susceptible to government policies and regulations, and any adverse changes may affect basmati rice exports and farmers through backward supply chain linkages. With the liberalization of the Indian economy in the early 1990s, the government provided several incentives to boost exports of basmati rice. These included financial assistance to exporters for quality improvement, packaging and brand promotion; support for participation in international fairs; and organizing buyer-seller meetings. Such measures contributed to an expansion in market size as well as vertical coordination in the industry.

However, the imposition of a ban on basmati rice exports during the global food price crisis of the late 2000s resulted in a rapid decline in the cultivated area of both basmati and *sharbati* rice in the Amritsar rice-producing belt. Sharbati is a long-grain non-basmati rice variety that is difficult to differentiate from genuine basmati rice and acts as a lower-grade substitute. Because of this, fraudulent traders adulterate basmati rice with sharbati because of the significant price difference between the two (sharbati gets a much lower price in the wholesale grain market). The government later imposed a minimum export price (MEP) that did not exist previously and an export duty on basmati rice exports to curb inflation (*The Hindu*,

7 March 2008). The MEP was fixed at US$900 (Rs48 000) per tonne during 2008, which adversely affected exports. At this price, exporters suffered from the cancellation of orders. Thereafter, the export duty was withdrawn yet the MEP remained. In 2011, a request was made by farmer group representatives for the government to set a minimum farmgate price for basmati that would be linked to the MEP in order to protect farmers from price fluctuations (Jagannathan, 2011). This proposal was not adopted and the government reduced the MEP to US$700 in early 2012 (Dutta, 2012), and then removed it completely for basmati rice in July 2012[24]. As a result of these policy changes, exports began to pick up.

A further challenge to CF is the high tax paid by buyers. According to the policy of the state government, buyers of basmati rice have to pay several taxes in the wholesale food grain market in the Punjab. These include a purchase tax of 4 percent, market fees and rural development charges of 2 percent each, commission to the CAs of 2.5 percent and administrative charges, among others. Previous incentives on market fees and rural development charges offered by the PSMB were withdrawn in the 2010/11 crop marketing year. This increased the purchase price of raw materials for the industry, which affected competitiveness in the export markets when compared with products from Pakistan, an important producing country where duties are either very low or non-existent on branded rice (CRISIL Web site). A noticeable effect of such government interventions was the fact that Gee Gee Agro Tech withdrew from CF operations.

9.8 CONCLUSIONS

The study indicated that with the liberalization of the Indian economy, several factors have contributed to an expansion of the market and to the emergence of new markets and market coordination mechanisms for basmati rice. In addition, the market evolved into several subsectors for basic and value-added products. Coupled with such macro-level sectoral market developments, the Punjab state government fostered a shift in land area patterns, from the traditional wheat-paddy rotation to alternative crops, in order to cope with the problem of depleting groundwater levels. The lure to produce basmati rice in the Punjab received an added boost with the introduction of the new hybrid variety Pusa-1121, which led to a substantial expansion in the cultivated area, particularly since mid-2000 (Khanna, 2011).

This changing environment provided an incentive for PepsiCo to shift the focus of its long-standing CF operations with other crops to basmati paddy and expand the area under contract over time. As with the typical "resource provision" form of agricultural contracts, PepsiCo provides farmers with access to requisite seed varieties, technical expertise and training, and then buys back the crop at preannounced market-based prices (if the base contract price is significantly below market price), making prompt payments. Moreover, in an unusual concession to farmers engaged in CF operations, the firm enables them to sell basmati rice to alternative buyers.

[24] Government of India, Ministry of Commerce & Industry, Department of Commerce, Notification No. 6 (RE-2012) /2009-2014, New Dehli, dated 4th July, 2012, removal of Minimum Export Price (MEP) of Basmati rice.

PepsiCo focused its basmati rice operations in areas that did not have well-developed markets for this crop. In these regions, the company selectively aligned with farmers who could not shift to cultivation of the crop on their own. CF thus succeeded in Punjab state in the non-traditional areas, once the initial hurdle of shifting to the new crop had been overcome by farmers, especially those who adhered to contracts. While farmers working with PepsiCo could reap the benefits of emerging market opportunities for basmati rice, it is interesting to note that independent resourceful farmers near developed markets have also succeeded in attaining benefits on their own. This suggests that while CF was not a necessary condition for farmers in the Punjab to gain from growing market opportunities, it was certainly a mechanism of market access for more disadvantaged producers to benefit.

The study has shown that farmers' incomes have increased both because of higher productivity and the higher prices of basmati rice. Yet even though independent basmati paddy growers also enjoyed such benefits, the risk of delayed payments from sales placed them at a potential disadvantage *vis-à-vis* farmers working under contract. This was an additional attraction for contracting to succeed in the region.

An interesting and rather unique feature of this case is the strictness of the regulations for basmati rice marketing in the state, with the requirement for products to be delivered to wholesale markets and be transacted with the intermediation of CAs. By introducing contractual clauses that enable farmers to sell outside the contractual bond and by working with the CAs, PepsiCo succeeded in implementing CF operations under this challenging business environment.

The experience of PepsiCo in the Punjab suggests that, in a growing competitive market environment for basmati rice, the location advantages of focusing the contracting operations in areas of less interest to the competition proved to be a successful strategy. Even so, it is essential for a contracting company to pay a competitive price and make timely payments to farmers, otherwise farmers may shift to other companies for crop disposal or the cultivation of competing crops in the following year. In addition, as information on practices of non-competitive prices and delayed payments is generally shared among growers through word of mouth, reputational risks for the contracting company do also exist.

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Chapter 10

Inclusion of small-scale farmers in the Brazilian biodiesel production chain

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10.1 INTRODUCTION

Contract farming is a key element in the Brazilian Biodiesel Program. Launched by the Federal Government in 2004, PNPB (the National Program for the Production and Use of Biodiesel) established a mandatory blending of biodiesel to diesel in Brazil, which stood at 5 percent (B5) in 2010. This blend represents a captive market of about 2.4 billion litres of biodiesel per year and is distributed to around 38 000 petrol stations throughout the country. In addition to the economic goals involved, the social inclusion of small-scale farmers is a specific objective of the programme, with the industry-farmer relationship regulated by a certification scheme called the Social Fuel Seal. Currently, some 109 000 small-scale farmers are involved. Certified biodiesel producers benefit from tax incentives and are allowed to participate in exclusive auctions organized by the Brazilian National Agency of Petroleum, Natural Gas and Biofuels (ANP), which represent 80 percent of the biodiesel traded in the country.

The Social Fuel Seal consists of a certification granted by the Ministry of Agrarian Development to biodiesel producers that acquired from 15 to 30 percent of oilseed from small-scale farmers or that supplied input or provided services to these farmers through legally binding agreements. The contracts, which must be supervised by official small-scale farmer organizations, will safeguard rural incomes and provide for technical training and assistance to farmers (Brazil, 2009).

The main challenges of PNPB are to increase the number of small-scale farmers involved in the oilseed chain, especially in the North and Northeast regions of Brazil, and to diversify oilseed sources, since soybean accounts for around 80 percent of the raw material used in the biodiesel industry of the country.

10.2 BIOFUELS IN BRAZIL

Since the oil crisis of the 1970s, the issue of energy supply has been a strong concern in the global agenda of economic and geopolitical discussions. The concentration of oil reserves in a few countries, unstable oil prices and uncertainties over continued oil supply have constantly led to tensions in the international scenario. In addition,

the negative environmental impacts resulting from the use of fossil fuels and sustainable energy supply to meet the growing world demand represent huge challenges to national and international energy public policies.

According to the International Energy Agency (IEA), 80 percent of global energy consumption is based on fossil sources. Crude oil represents 36 percent of total energy consumption, and short- and mid-term forecasts indicate no significant changes in the world energy matrix. The transport sector accounts for around 50 percent of total oil output, and approximately 95 percent of its energy demand is supplied by the oil industry. During the oil crisis of the 1970s, many countries planned programmes to replace fossil fuel. However, the majority of these have not been implemented. The Brazilian programme to replace gasoline [petrol] with ethanol (Pro-álcool) is a rare exception. Nowadays, ethanol represents more than 50 percent of the fuel used in Otto-cycle vehicles in Brazil (Abreu, Vieira and Ramos, 2007).

Initiatives were also developed to replace diesel during the oil crisis at the beginning of the 1970s. Vegetable oil production within the scope of the Pro-óleo fuel use programme was discontinued because it was not economically feasible at that time.

PNPB, launched in late 2004,was implemented in 2005, after the enactment of a regulatory law. The programme involves 14 ministries, organized in an executive committee. Its four main objectives are to: (i) structure the biodiesel supply chain in Brazil; (ii) produce biodiesel from different oilseeds (such as castor seeds, cotton, peanuts, palm oil, sunflower seeds and soybeans) from the various regions of the country; (iii) promote social inclusion and regional development in underdeveloped areas; and (iv) support the production of a new source of oil supply at competitive prices (Zapata, Brune and Adero, 2010).

The diversity of available oil crops and the different oil extraction techniques enable implementation of biodiesel plants all over the country. However, such diversification increases the complexity of the production chain and consequently the importance of analysing the interrelations in biodiesel production chains.

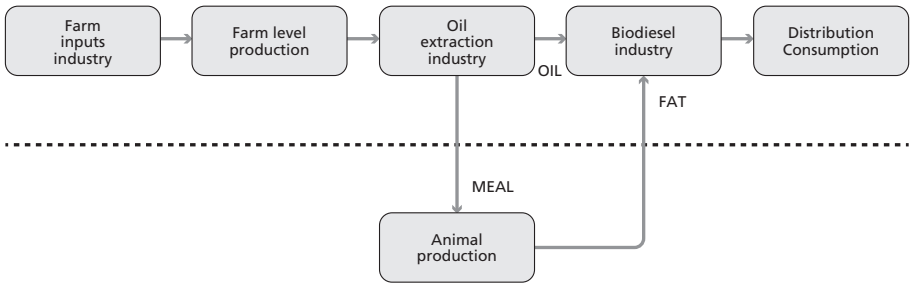
Analyses of different biodiesel production chains in Brazil have identified the use of oil by-products as key to the success of any biodiesel project. This is directly related to the challenges of oil supply/prices for the biodiesel industry and to appropriate income levels from family-based agriculture.

The flow of the main products and by-products from the biodiesel production chain, in particular the flow of vegetable oil/fat and oilcake, is represented in Figure 10.1.

Oilcake, which has high protein levels and represents more than half of the weight of oil crops, can be used in energy generation. However, the potentially high prices of this by-product for use as feedstock are the main contrast in energy source replacement programmes involving gasoline (Proálcool) and diesel (PNPB). The schedule in Figure 10.2 represents the potential impacts of biodiesel production on food supply, which depend on the trade-off between the competition for arable land (and inputs) and the increased meal for the production of animal protein.

Incentives for biodiesel production increase the demand for raw materials, especially vegetable oils, as depicted in Figure 10.2. Therefore, there are strong incentives to increase oilseed production. When land use is changed to meet the demands of biodiesel production, capital and production inputs become limited, and the availability of these resources for food production decrease. Pricing mechanisms

FIGURE 10.1
Biodiesel production chain

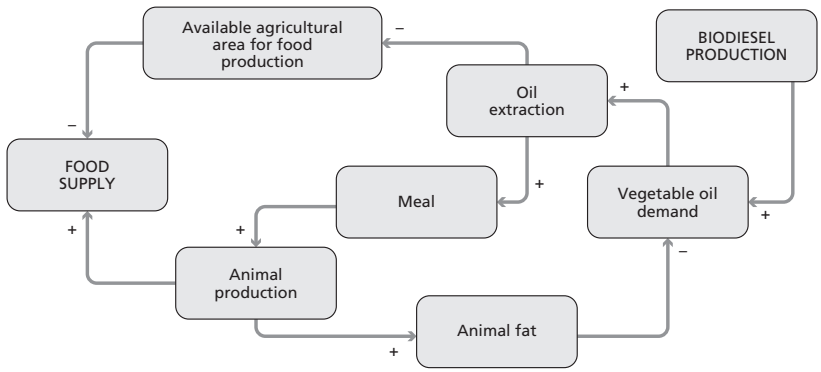


Source: authors.

could offset or mitigate this impact, but the impact on food production is inevitable. Furthermore, it is important to note that vegetable oil production, mainly from oilseeds, is a by-product of vegetable protein production. This is evident in the soybean production chain, which contains 18 percent oil and about 40 percent protein. Availability of vegetable protein is essential for the competitive production of pigs, chicken, beef cattle and milk. In addition to generating social and economic impacts, animal protein production promotes the availability of animal fat. In fact, in the case of Brazil beef cattle, fat is the second most important raw material for biodiesel production.

A key factor regarding desirable effects of biodiesel production is its potential to exert a positive influence on food availability, through programmes and price guarantees that allow the introduction of state-of-the-art technologies and consequently

FIGURE 10.2
Potential impacts of biodiesel production on food supply



Source: authors.

higher productivity and better resource use. The use of degraded pastures for soybean crops, for instance, specifically in the case of Brazil, represents a very positive impact in terms of social, economic and environmental sustainability. The existence of a captive market for oil crops can also reduce the market risk and increase the supply of food with high nutritional value, such as meat, eggs and milk.

Considering the interdependency of both vegetable and animal production systems, coordination is a critical element for agricultural production and the oil extraction industries, since it can affect the competitiveness of the relevant agrifood production chains.

10.3 THE SOCIAL FUEL SEAL

Created in 2005, the Social Fuel Seal is a regulatory framework instrument aimed at promoting the social inclusion of small-scale farmers (Brazil, 2009). The seal is a certification granted by the Ministry of Agrarian Development to biodiesel companies that comply with the requirements numbered below. It provides biodiesel producers with favourable financing schemes, tax exemptions and especially the right to participate in specific auctions organized by ANP, which represent 80 percent of the total traded volume in Brazil.

The basic requirements for biodiesel producers to be entitled to the seal are the following.

1. *Acquisition of a minimum percentage of raw material from small-scale farmers.* A norm issued in September 2012 specifies that the minimum amount is given by the formula x/y*100, where x is the total amount of expenditures from family farms and y is the total amount of expenditures from all sources. The minimum amounts vary according to the Brazilian geographic region where acquisitions from smallholders take place, as presented in Table 10.1.
2. *Execution of contracts with small-scale farmers*. The negotiation of the contract clauses must be mediated by an official representative body (trade union, association or federation). Each participant must have a copy of the contract.
3. *Provision of technical assistance* to small-scale farmers during all agricultural production phases.
4. *Training of small-scale farmers* on oilseed production techniques that do not affect family food safety or put their financial situation at risk.
5. *Promotion of cultivation of oilseeds* in delimited areas only, or in those areas where there are proven technical recommendations.

Besides the regulatory framework of the Social Fuel Seal, the Ministry of Agrarian Development established a biodiesel production centre project, which aims to increase the number of small-scale farmers participating in PNPB, as well as to boost and strengthen rural cooperatives and associations, diversify oilseed crops and increase and diversify sources of rural income.

These biodiesel centres are organized on a regional or microregional level, according to similarities in terms of soil, climate and social conditions. They comprise the main organizations involved in agricultural production, e.g. municipalities, technical assistance services, biodiesel producers, public banks, Non-governmental Organizations (NGOs), unions and researches bodies. In December 2010, there were 63 centres distributed throughout 1 091 municipalities across Brazil.

TABLE 10.1
Amounts of raw material and expenses that can be included in the minimum percentage required, per geographic region

Region	Minimum percentage of expenditures on acquisitions from smallholders	Maximum acceptable value for "x" (share of expenditures on smallholder acquisitions)
Northeast and semi-arid region	30	100
Southeast	30	50
South	35–40	50
North	15	100
Midwest	15	50

Source: Brazil, 2012.

The following section presents the characteristics of the contracts between small-scale soybean and biodiesel producers entered into under the Social Fuel Seal regulatory framework.

10.4 CONTRACTS BETWEEN SMALL-SCALE FARMERS AND BIODIESEL PRODUCERS IN BRAZIL

The mechanism of contracts between farmers and the agro-industry has been cited in the literature since the nineteenth century. FAO (2001) proposed the following models.

- *Centralized model*
  - Involves a centralized processor and/or packer buying from a large number of small farmers
  - Used for tree crops, annual crops, poultry and/or dairy products. Products such as tea or vegetables for canning or freezing often require a high processing level
  - Vertically coordinated, with quota allocation and strict quality control
  - Sponsors' involvement in production varies from minimum input supply to the other extreme, in which the sponsor takes control of most production aspects
- *Nucleus estate model*
  - A variation of the centralized model, in which the sponsor also manages a central estate or plantation
  - The central estate is frequently used to guarantee throughput for the processing plant, but sometimes is used only for research or breeding purposes
  - Often used with resettlement or transmigration schemes
  - Involves a significant provision of material and management
- *Multipartite model*
  - May involve a variety of organizations, frequently including statutory bodies
  - May derive from the centralized or nucleus estate models, e.g. through the organization of farmers into cooperatives or the involvement of a financial institution

- *Informal model*
  - Characterized by individual entrepreneurs or small companies
  - Involves informal production contracts, usually on a seasonal basis
  - Often requires government support services, such as research and extension
  - Involves greater risk of extra-contractual marketing
- *Intermediary model*
  - Involves sponsors in subcontracting relations with farmers and intermediaries
  - The sponsor may lose control of production and quality, as well as of the prices paid to farmers

Under the Social Fuel Seal framework, the contracts between small-scale farmers and biodiesel producing companies fall into the multipartite model. That is, the participants are represented by the Brazilian Government (Ministry of Agrarian Development), the official representative of the farmers, the farmers themselves or their cooperatives, and the industry.

10.5 SOYBEAN AND CASTOR SEED FARMERS

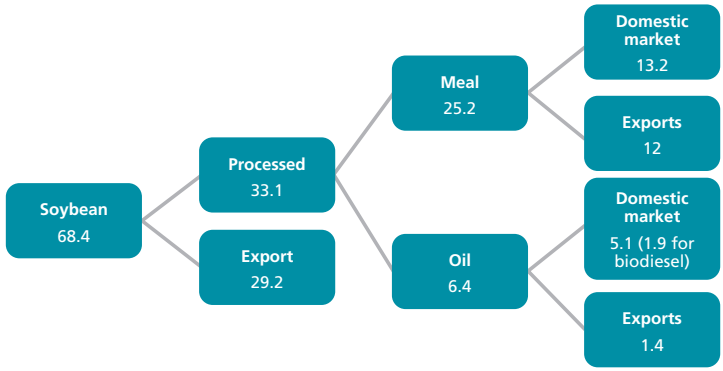
Soybean production in Brazil expanded rapidly in the early 1970s, as a result of a development programme focusing on the savannah region of the country. Currently, Brazil is the second largest world producer, the second largest exporter of soybean meal and the third largest soybean oil exporter. Soybean is a major source of foreign capital inflow in Brazil, accounting for about 10 percent of exports and for the creation of 1.4 million jobs. According to the Ministry of Agriculture, the soybean cultivated area in Brazil will increase to about 26.5 million ha by 2018. In recent years, the soybean market has grown at a rate of 7 percent per year, mainly driven by the food industry and animal protein.

Soybean represents 80 to 85 percent of the oilseed used in the Brazilian biodiesel production chain. Although most soybean producers in Brazil are classified as large-scale commercial farms, 16 percent of the producers classified as small-scale farmers play a key role in the biodiesel programme, since the biodiesel companies depend on them to meet the Social Fuel Seal requirements. Currently, soybean accounts for 95 percent of total oilseed acquired from small-scale farmers in the biodiesel industry.

As depicted in Figure 10.3, 43 percent of the 68 million tonnes of soybean produced in Brazil are exported. Processed soybeans generate 25 million tonnes of meal and 6.5 million tonnes of vegetable oil. The main product from the soybean chain is soybean meal, which is used as feedstock in the production of poultry, pork, beef, milk and eggs. Vegetable oil is a secondary product in the soybean chain, so that in order to measure the impact of the biodiesel industry on the cultivated soybean area it is necessary to consider mainly the poultry and pig markets. Currently, 1.9 tonnes, or about 30 percent, of the soybean oil produced is used by the biodiesel industry (ABIOVE, 2010).

In the Brazilian savannah region, biodiesel companies actively search for soybeans that are produced with the participation of small-scale farmers. In the northern area of the state of Goiás, 1 672 small-scale farmers supply oilseed to the biodiesel companies, in compliance with the contract scheme described in the next section. COOPAFANA is a small cooperative formed by rural settlers of

FIGURE 10.3
Soybean products in Brazil, 2009/2010 (in million tonnes)



Source: Abiove, 2010.

the 2001 agrarian reform; it exemplifies the system whereby soybean small-scale farmers are included in the biodiesel programme. Contractual agreements between COOPAFANA and family farmers follow the standard terms of contracts between biodiesel companies and farmers. Clauses related to pricing and technical assistance (detailed in the next section) are common to all contracts.

Before discussing the COOPAFANA case, it is important to highlight that several other oilseeds are considered as sources of vegetable oil by the Brazilian biodiesel programme, including castor seed, oil-palm, cottonseed and *Jatropha curcas*. Castor seed oil in particular raised high expectations in the early stages of the programme. Brazil has a long tradition in castor seed production and in the 1970s the country was the top producer worldwide. Currently, it ranks third in global production, behind India and China. Production is concentrated in the semi-arid region, where the inclusion of small-scale farmers is a priority. In spite of the appeal of castor seeds and other non-food raw materials for biodiesel production, potential expectations have not yet been fulfilled. In the case of castor oil, its high viscosity is a drawback for the production of biodiesel, a factor that favours alternative crops such as soybean. In addition to this industrial restriction, Brazilian production and productivity of castor seeds have decreased considerably in the last three decades. Production is concentrated in the Northeast region of Brazil, where farmers do not apply modern inputs such as improved seeds and fertilizers, because of lack of training, technical assistance and financial support.

Nevertheless, despite the failure of the initial projects, it is widely recognized that castor seed oil can still play a strong direct or indirect role in Brazil's biodiesel programme. The existence of a captive market for the oil through the Social Fuel Seal can, in principle, promote the adoption of state-of-the-art technology, improve the organization of the production chain and increase small-scale farmers' income through the sale of oil-producing crops to biodiesel companies or the chemical industry. However, until these transformations in the castor seed and other alternative crop chains occur, the country is relying on soybean as the major feedstock for biodiesel production.

10.6 CONTRACTS

The clauses described below are examples of contracts entered into by small-scale farmers and biodiesel plants, in compliance with the Social Fuel Seal basic requirements. The COOPAFANA contract for soybeans was used as the basis for the following discussion.

10.6.1 Identification of small farmers and sponsors

The sponsor must provide general background information about itself, including its address, the identification of a representative and its corporate taxpayer identification (CNPJ) number. Small farmers must provide their addresses, individual taxpayer identification (CPF) number and a document that qualifies them for the Brazilian National Program to Strengthen Family Farming (PRONAF). This document, known as DAF, is issued by an official extension service or a small-scale farm union.

10.6.2 Trading volume and contract farming term

This clause defines the trading volume of raw material used in biodiesel production, as shown in Table 10.1. The contract term begins before planting and must cover the entire process until the delivery of the goods.

10.6.3 Price determination

This is the most important part of the contract, i.e. the definition of trading prices that will be effective during the contractual period. There are several ways to establish the trading price, the most common of which is based on the Program of Price Guarantee to Family-based Agriculture (PGPAF). The average prices of major local markets or the market price of products are other alternatives adopted. The PGPAF is a well-funded federal programme that ensures low-interest credit for small-scale farmers, under special schemes such as the PRONAF credit lines for investment and working capital, with special provisions for situations when market prices are low. In these cases, interest rate discounts are offered that correspond to the difference between market prices and the guaranteed product price. Loans are then settled according to the specific production aspects of each particular region.

An important item in the contracts is the possibility of price adjustments, which can be defined in different ways, the most common being bonus payments per group of small farmers, fixed payments or a percentage of the price to be adopted, and the trend prices on the Chicago market (Chicago Board of Trade [CBOT]).

10.6.4 Product quality specifications

Entering into contracts requires mutual agreement on the quality specifications of the product to be delivered. According to the Ministry of Agriculture, soybeans may have up to 14 percent of moisture, 1 percent of impurities, 8 percent of damaged parts, 6 percent of mould, 4 percent of rotten parts, 8 percent of green beans and 30 percent of broken grains. Where the product does not fulfil the quality criteria, it may be refused and the contract cancelled. Farmers and buyers should also agree on the location where the product is to be delivered.

10.6.5 Technical assistance

In order to grant the Social Fuel Seal, the Ministry of Agrarian Development requires companies to provide technical assistance to farmers, under clauses that must be clearly specified in the contract. This process usually involves the following three parts.

- *Pre-activities*, which consider issues such as inclusion of small farmers in the project through associations and unions; survey of their intentions concerning planting; clarification about the contract and the role of the technical assistance team; and formation of groups for the production of raw materials to be used in biodiesel production.
- *Development of technical and financing plans,* whereby plans that are specific to each farmer need to be prepared and submitted to the Ministry.
- *Planting and production monitoring*, including requirements on purchase of inputs and contracting of services needing to be done simultaneously in order to reduce production costs; training of technicians and small-scale farmers on the use of technology in planting activities; monitoring of all steps in the production process; and coordinating and conducting meetings for the dissemination of best practices for planting and crops.

Furthermore, the company must continuously monitor the farmers' production areas to protect them from the incidence of pests and diseases.

10.6.6 Termination of contracts

The contract may be terminated by the farmers or by the sponsors, regardless of previous notice, in the following cases:

- insolvency, bankruptcy, or judicial liquidation;
- breach of any term of the contract by any of the parties;
- no delivery or delayed delivery of products and absence of or late payment.

In the case of contractual breaches in whole or in part, the defaulting party is subject to fines of 10 percent and an interest of 1 percent per month on the total amount negotiated under the contract.

The above-mentioned clauses related to prices, quantities and provision of technical assistance are defined in general terms by the Social Fuel Seal regulations. They are the key variables that enable the participation of small farmers and guarantee their income.

10.7 RISKS AND BENEFITS

The biodiesel chain represents an interesting production alternative for small-scale soybean farmers based in the northeastern Goiás state and throughout the country. A formal agreement and a captive market guaranteed by the blending mandate significantly reduce the market risk associated with high fluctuation in the prices of staple foods such as rice, beans and maize.

PNPB was designed to include small-scale farmers in the biodiesel market through farming contracts. In this light, the Federal Government created incentives for sponsors, such as tax exemption and exclusive participation in the auctions held by ANP (which represent 80 percent of the total volume traded). In 2009, 27 biodiesel producing companies had Social Fuel Seal certification, represent-

TABLE 10.2
Number of small farmers supplying raw material to biodiesel companies, by region

Region	2005	2006	2007	2008	2009	2010
Northeast	15 000	30 226	6 850	17 187	17 711	40 000
South	0	8 736	27 928	8 767	29 150	54 000
Southeast	914	7	55	27	1 457	6 000
Midwest		1 441	1 690	1 662	2 550	6 000
North	414	185	223	215	179	3 000
Total	**16 328**	**40 595**	**36 746**	**27 858**	**51 047**	**109 000**

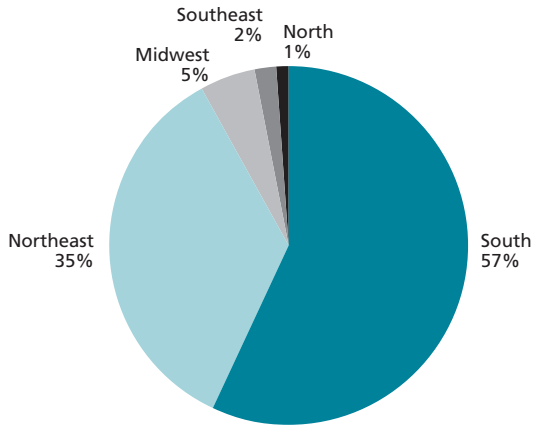
Source: Brazil, 2011.

ing 60 percent of such companies in Brazil, and in 2010 this figure increased to 43 companies. Considering their installed capacity, the share of companies holding the seal in relation to the total production is 90 percent.

Contract farming has enabled the increased participation of small farmers in the biodiesel market, with positive impacts on job creation in rural areas. According to the Federal Government, from 2005 to 2010, the number of small farmers supplying raw material to biodiesel companies increased from 16 000 to 109 000 (Table 10.2). Considering the numbers of farmers involved per region, the South and Northeast regions are at the top of the ranking.

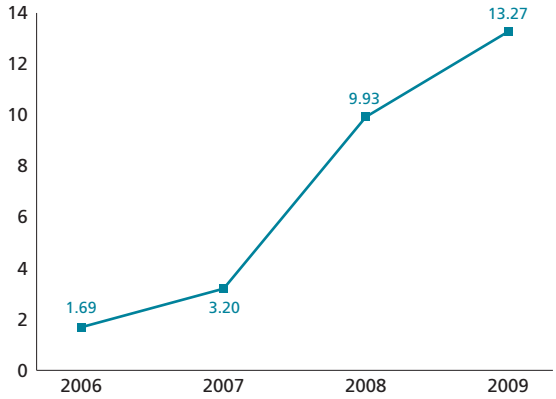
As shown in Figure 10.4, 35 percent of small farmers are located in the Northeast and 57 percent in the South. These two regions combined represent over 90 percent of the total of small farmers supplying oil to biodiesel companies.

FIGURE 10.4
Participation of small farmers in the biodiesel market, in 2009, by region



Source: Brazil, 2011.

FIGURE 10.5
Evolution of the average annual income of small farmers (R$'000/farmer)



Source: Brazil, 2011.

TABLE 10.3
Variation of average annual income per farmer, by region, from 2008 to 2009

Region	2008 (R$)	2009 (R$)	(%)
Northeast	271.83	1 506.15	454
South	16 443.60	14 534.30	-12
Southeast	147 463.38	14 965.65	-90
Midwest	72 970.65	79 491.06	9
North	11 389.46	13 867.87	22
Total	**9 926.79**	**13 268.94**	**34**

Source: Brazil, 2011.

The adoption of contract farming increased the average annual income of small farmers participating in PNPB. As shown in Figure 10.5, the average annual revenue per farmer participating increased by 600 percent, from R$[25]1 690 in 2006 to R$13 270 in 2009. Table 10.3 shows the evolution of average income per farmer by region. The Northeast region recorded the highest growth between 2008 and 2009, with an increase in average revenue per household of more than 400 percent.

Farming contracts also provided additional benefits to small farmers and biodiesel producers. Farmers sell their output at a fixed price and benefit from technical

[25] In 2011, the annual average exchange rate was US$1 to R$1.67. *Source*: Brazilian Central Bank (BCB).

assistance that is generally provided free of charge. Additionally, they can still grow other products under intercropping systems, combining the production of oilseeds with that of subsistence foods or other marketable crops.

With regard to the industrial biodiesel producers, the companies can invest resources in productivity enhancement activities and consider these expenditures as items that can be added to the "acquisition of raw material" entries in their bookkeeping. This is an important incentive, as companies are required to meet a minimum percentage of their expenditures on their smallholder purchasing systems. Indeed, expenditures of raw materials have grown significantly: in 2006, R$69 million were spent by the biodiesel industry on the purchase of family-based farming products, while in 2010 that figure exceeded R$950 million.

In certain cases, the biodiesel industry, in addition to providing technical assistance, finances family-based farms through advance loans for the purchase of seeds and machinery. Such added bonuses for small-scale farmers producing oilseeds have become a common practice throughout the country, representing an important source of financing originating from within the value chain.

It is not considered that the contracts entered into under the scope of the Brazilian biodiesel programme present any risks for small-scale soybean farmers. On the contrary, farmers reduce risks by gaining access to a guaranteed market in the biodiesel industry and are still able to sell their products in traditional channels, with no additional requirements regarding quality or amounts. However, the situation differs in the case of other oilseeds. When planting a new crop, such as *Jatropha curcas* or macaw palm, for example, where the market is currently limited or non-existent, the risk faced by farmers is significant, as a new crop needs to be supported by additional investments in areas such as infrastructure, research and training, which fall outside the scope of production contracts.

With respect to risks faced by the biodiesel industry, while contracts play an important role in guaranteeing raw material supplies and ensuring access to the biofuel auctions, the availability of soybean produced by small-scale farmers is limited and there is always a risk of decrease in local production resulting from adverse weather conditions, pests or diseases. In these cases, companies need to enter into contracts with family farmers in other regions, which may lead to increased competition among firms in a given region.

10.8 EXTERNAL FACTORS

A negative factor that affects farming contracts of soybeans and other oilseeds used in biodiesel production is the state control of the sector and the associated bureaucratic requirements to operate. To participate in PNPB, the Social Fuel Seal certification is required. To obtain the seal, companies must submit several documents to a responsible agency, which establishes a deadline of up to two months for examination and analysis. After this period, if there is any irregularity on the part of the company, recommendations are provided and a resubmission document needs to be prepared. After this process, the institution establishes a new deadline of up to two months to analyse the changes related to the requirements. This procedure can be costly and time consuming, and can negatively impact the execution of farming contracts.

Despite the success of bioenergy programmes in Brazil, the sector has faced difficulties in the past that compromised the risk perceptions of stakeholders

regarding the strong role played by government in the key policies and regulatory frameworks. The bioethanol programme, for instance, faced a profound crisis in the 1980s, when the Federal Government virtually abandoned it. Problems with bioethanol remain to this day, with Brazil being forced to buy ethanol internationally in past years. The current biodiesel programme is a continuation of the Pro-óleo programme, which was launched in the 1970s and was discontinued soon afterwards. Brazil's macroeconomic stability in recent years and the consolidation of the soybean production chain contributed to reduce the risk perceptions in the biodiesel chains, but in any case the idle capacity of biodiesel companies is at present a high 47 percent, a fact that suggests the sector is still facing challenges in order to achieve optimal performance (Bergmann *et al*., 2013).

Environmental issues also have a direct impact on the operation and expansion of the biodiesel programme. The soybean production chain developed initiatives to preserve the Amazon rainforest through an agreement involving industries, farmers, NGOs and the Federal Government. This agreement, known as the Soy Moratorium, was recently renewed. The expansion of the soybean production area has thus been limited in this region.

A key issue for the future of the programme is the continuation of the Social Fuel Seal, which in spite of being guaranteed by law, may have its regulations (incentives and tax benefits) amended. Any changes could potentially compromise the competitiveness of the production of oilseed in family-based farming and the overall production of the biodiesel industry.

10.9 CONCLUSIONS

The Brazilian biodiesel programme has already generated positive results within five years of its implementation. Although the 109 000 smallholders involved represent a small share in relation to the total number of small farmers in Brazil (4.5 million), they nevertheless represent a substantial figure compared with the 40 000 sugar-cane producers involved in the 40-year old ethanol programme.

PNPB's main challenge is to increase the number of small-scale farmers involved, mainly in the North and Northeast regions of Brazil. Another challenge is the diversification of raw material sources, as approximately 85 percent of the raw material derives from soybean, 10 percent from animal fat and less than 5 percent from other sources. In the semi-arid region (Northeastern Brazil), biodiesel companies sign contracts with castor seed producers, but soybean oil purchased from other regions of the country is still the main, and sometimes the only, raw material available to these companies.

The limited availability of soybeans produced by small-scale farmers is a challenge that the industry can plausibly address by investing in mechanisms that promote higher farm-level productivity. A recent research study carried out by the authors of this chapter analysed the introduction of economic incentives in contracts. In the scheme, farmers received an extra bonus on soybean prices according to the efforts they made towards productivity gains (Clemente and da Silva Júnior, 2013). The results, which were assessed using game theoretical analytical tools, showed that the introduction of incentives would benefit both farmers and the biodiesel industry.

The Social Fuel Seal is a critical factor behind the positive results obtained by the programme. The creation of a captive market for small-scale farmers takes place

under a regulatory framework that demands a mediated agreement (the multipartite contract farming model) between farmers and the industry. The formalization of production contracts, as required by the seal, is an important factor that has contributed to the organization of the oilseed production chain. Contracting farming will continue to be an essential and necessary tool for biodiesel producers and small-scale farmer organizations.

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Chapter 11

Contract farming in Thailand: Provision of genetically improved eucalypt plants and extension support

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11.1 INTRODUCTION AND BACKGROUND

Woodchip and pulp and paper companies have three main strategies to ensure wood supplies for their processing plants (Barney, 2004): (i) they purchase land; (ii) contract landholders; or (iii) buy from landholders and intermediaries on an open market. Because smallholders own almost all the private land in Thailand, it is almost impossible for a company to have access to a large area of land to establish plantation cultivation. The three main pulp and paper companies in Thailand, namely Advance Agro, Phoenix Pulp & Paper and Siam Forestry, choose to contract smallholders. They have around 80 000, 108 000 and 44 800 ha of eucalypt plantations respectively under contract farming (CF), (research interviews, 2008). The managing director of Advance Agro declared: "In Thailand, you cannot buy large tracts of land […] But our farmers are very well organized" (Toland, 2006: 15). For Phoenix Pulp & Paper, CF (as opposed to buying wood from the open market) is also a way to ascertain and plan its wood supply (knowing how much raw material it has in the field) and to make sure of the sustainability and regularity of this supply (research interviews, 2009).

The current total eucalypt production area in Thailand has been estimated at 480 000 ha by the Managing Director of Siam Forestry in Ratchaburi (personal communication from Mr Joompot Tanmani, 7 August 2009). In 2003, the area was estimated to be 460 000 ha by the Thai Tree Growers' Association and expected to increase (Cossalter and Pye-Smith, 2003) at an annual rate of 16–17 000 ha. Around 95 percent of the current total is privately owned (Sunthornhao, 1999) and contract tree growers account for approximately 70 percent of the total eucalypt plantation area in Thailand (personal communication, as above). Estimates suggest that there are at least 60 000[26] contract eucalypt growers for the three companies. *Eucalyptus camaldulensis*

[26] At least 6 000 contracted by Advance Agro, 50 000 contracted by Phoenix Pulp & Paper and 7 000 by Siam Forestry.

is the most popular species planted (Pousajja, 1993; Kijkar, 1995).[27] In Thailand, the annual increment of tropical eucalypts averages 10–20 m^3 per hectare per year and ten years is the maximum time it takes to reach maturity (Cossalter and Pye-Smith, 2003).

CF for eucalypts in Thailand is a form of partnership between smallholders and pulp and paper companies whereby smallholders are largely responsible for growing eucalypts, with companies providing incentives such as improved planting materials and free technical advice, and guaranteeing purchase of wood at the end of the rotation. Advance Agro, Siam Forestry and Phoenix Pulp & Paper provide support for smallholders to grow eucalypts, as the raw material for pulp production, together with the development of plants[28] to gain higher yields. Advance Agro in Prachin Buri in Central Thailand was the first company to establish a CF scheme with eucalypt growers in the early 1990s (Makarabhirom, 1994). Siam Forestry started CF in 1992, and Phoenix Pulp & Paper in 2005. In 1994, the doubling of the world price for pulp and paper created a great demand for planting stock of high genetic quality (Kijkar, 1995). This type of planting stock, adapted to the Thai ecosystems, has been developed by the three companies. They therefore sell three types of planting material to eucalypt growers: (i) seedlings, which are not genetically improved; (ii) tissue culture; and (iii) rooted cuttings. Tissue culture and rooted cuttings are both genetically improved, more expensive than seedlings, and likely to achieve higher wood yields. They are exclusively sold by these three companies and specific eucalypt clones are sold only to contract growers. Seedlings can be purchased from sources other than the companies, but the quality is generally lower. Research and dissemination through an extension system are carried out by companies rather than the government because the latter does not have the capacity and/or the incentives to support smallholder tree farming, whereas companies have both the technical capacity and strong financial and social incentives to help.

This chapter discusses the extent to which contracts can help farmers to access markets and use genetically improved eucalypt plants. The following section provides an overview of a case study in Thailand.

11.2 CASE STUDY

The presentation of the case study in Thailand is divided into four sections: (i) background to the contract agreement and historical perspective of CF in Thailand; (ii) characteristics of the contract; (iii) assessment of effectiveness of contract arrangements; and (iv) external factors beyond the control of the direct parties involved in the contract that are likely to affect the potential to establish and maintain contracts. The next section reviews the literature on the adoption of eucalypts in Thailand, considering the origin of CF in Thai agriculture and in tree farming.

11.2.1 Background to the contract agreement

Because of the intense competitiveness of the world market, product quality was the first priority of agro-industries in Thailand. These industries started CF in order to ensure that the supply of high-quality crops was reliable and competitively priced

[27] Hybrid clones of *Eucalyptus camaldulensis* and *E. deglupta* are also planted in the most humid areas.
[28] The term "plants" includes seedlings, tissue culture and rooted cuttings.

(Wiboonpoongse *et al*., 1998). In 1976, contracts that guaranteed prices for farmers were introduced (Singh, 2005). From its origins in sugar cane, broiler chickens and pineapple to oil palm and asparagus, CF has extended to new crops such as jasmine rice, organic rice, prawns, new kinds of vegetables, fruit for the frozen food industry (Wiboonpoongse *et al*., 1998) and baby corn, cassava, flowers, green beans, soybeans and tobacco (FAO, 2001). CF is a key strategy of the Thai Government to involve the private sector and foreign investment in the development of the Thai agricultural sector (Glover, 1992).

> *Of all the countries in Asia, Thailand probably has the most extensive experience with contract farming, in the widest range of crops. Contract farming is a key element of the Thai Government's development plan, reflecting a strategy of private-led integrated agricultural development* (Glover, 1992: 4).

Since the Fourth National Economic and Social Development Plan (1977–81), CF has been used to increase the exports of high value-added and high-quality products, and Thai experts such as Wiboonpoongse *et al*. (1998) have seen it as a promising way of giving fair benefit to both contract farmers and contracting companies in Thailand. The Sixth National Economic and Social Development Plan (1987–91) recommended that CF "should be further promoted, on condition that the provisions of such agreements are amended to be more effective and beneficial to all parties concerned" (Singh, 2005: 219). Makarabhirom and Mochida (1999) describe the impacts of Thai policies on CF in forestry.

> *The Thai Government introduced a "Four Sector Cooperation Plan for Agricultural and Industrial Development" in 1988 to encourage partnerships among government, farmers, agribusiness and financial institutions. This policy has had an important effect on the pulp and paper industry, enabling a number of timber outgrower schemes. One of the largest producers, the Phoenix Pulp & Paper company, has had little success with large-scale plantations and now sources all of its raw materials from small-scale farmers, through direct purchase or outgrower agreements* (Makarabhirom and Mochida, 1999; cited in Mayers and Vermeulen, 2002: 151, Box 52).

The Seventh Plan (1992–96) went even further in encouraging CF (Singh, 2005). It was no longer mentioned in the Eighth and Ninth Plans but "individual departments are still implementing [contract farming] on the ground" (Singh, 2005: 220). For instance, the Royal Forestry Department (RFD) distributed five million free eucalypt seedlings in 2008 and 30 million in 2009 to Thai smallholders. However, Phoenix Pulp & Paper feels that it is a financial loss for its company in terms of planting material sold and that farmers do not easily understand the differences in terms of quality between seedlings given by the RFD and clones sold by the company (research interviews, 2009).

11.2.2 Characteristics of contracts

The presentation of the characteristics of contracts is divided into two subsections. The next subsection reviews the rights and duties of both parties involved in a

contract tree farming scheme. This is followed by a description of the sampling approach followed to collect primary data.

Rights and duties of contract farming for eucalypts

This section describes the rights and responsibilities of both parties in a contract eucalypt farming scheme in Thailand and the competition between companies. The information was collected in the field.

Individual contract eucalypt growers sign a contract with the company, which has to provide good-quality plants and fertilizer, technical advice and training. It also guarantees to buy the wood after a rotation of four or five years (depending on the company).[29] Contract growers are committed to sell their full crop to the company.[30] Contracts from all companies include the following conditions.

> *(Clause 3) People who join this project promise that they will not sell the plants to other parties. (Clause 7) Once the eucalypts are old enough to be harvested, the people who have joined the project have to sell to the company within seven years from the date of planting. (Clause 8) If people who join the project do not follow this agreement, they agree to repay to the company the value of damage incurred.* (Extract from contract document with Phoenix Pulp & Paper 2008, translated from Thai.)

Companies propose a contract that guarantees a fixed minimum price for mature eucalypts that they will pay at the time of harvest and agree to pay a market price if, at that time, the market price is higher than the fixed minimum price. For contracts signed with Siam Forestry and Advance Agro in 2008, the fixed minimum guaranteed price was 800 baht/tonne for diameters over two inches (5.08 cm). Between 2011 and 2013, when contract eucalypt growers harvest, they are guaranteed to receive this minimum price if the market price is lower. The fixed minimum guaranteed price varies from year to year according to market prices and the supply-demand curve. Although there was a decrease in wood market prices in 2008, the fixed minimum guaranteed price in contracts signed in 2009 has been increased because the companies foresee a decrease in wood supply in the coming years (research interviews, 2009).

In all cases, prices vary with eucalypt diameter (Table 11.1). This quality-based payment system is an incentive mechanism built into the contract: farmers are given a financial incentive to wait until their trees reach 2.5 inches in diameter before they harvest them. Companies said that CF is beneficial for smallholders located in areas where conditions for growing eucalypts were good and some land was available but markets or start-up were difficult. These situations occurred in the 1990s in Thai-

[29] Phoenix Pulp & Paper indicated average yields from first and second rotations: 12 tonnes after three years and 15–16 tonnes after four years for plantations from rooted cuttings or tissue culture, and 6 and 8 tonnes respectively for plantations from seedlings (research interviews, 2009).

[30] In some villages located near the mill and where there are no competitors, it is acceptable to the company to resell to an intermediary because all of them in this area sell to the company. They do so not because they have a contract with the company but because other companies cannot offer them a price that would cover their transportation costs.

TABLE 11.1
Mill gate prices paid to contract eucalypt growers in 2008 (baht per green tonne of wood, with bark)

Log diameter (measured at the edges, and 2.5 m long)			
1 inch[a]	>1.5 inches	>2 inches	>2.5 inches
550	700	1 200	1 250

[a] 1 inch = 2.54 cm
Source: research interviews, 2008.

land because the wood market was volatile and it was advantageous for farmers to have a fixed minimum price (Makarabhirom and Mochida, 1999). Contracts insure against price risk but involve some loss of flexibility; therefore, they are more likely to be adopted when there is greater perceived uncertainty about prices.

TABLE 11.2
Terms and conditions of the contract offered by Advance Agro

Duties of the company	Give technical advice about land preparation, planting, spacing, together with maintenance
	Replace planting material in case of disease problems
	Purchase wood
	Guarantee fixed minimum price at mill gate: 1 200 baht/tonne for diameters >2.5 inches; 950 baht for diameters 1.5–2.4 inches
Duties of the contract grower	Buy cash[31] planting material from company (seedlings that are not genetically improved are sold at a lower price to contract growers than to non-contract growers; tissue culture and rooted cuttings, both genetically improved, are sold to contract growers only)
	Follow technical advice: company can renege on purchase or pay lower price if wood quality is insufficient because grower did not follow technical advice
	Inform company of harvesting intention[32]
	Harvest at five years and sell to company[33]
Prohibitions for growers and fines[34]	Selling planting material bought from company: fine 50 baht/seedling
	Multiplying this planting material
	Selling wood to other buyers: fine 50 baht/tonne

Source: research interviews, 2008.

[31] No credit is provided.
[32] The fact that growers have to inform the company before they harvest assists the company in regulating input flow.
[33] There are rumours that Advance Agro will soon offer a contract that is more flexible and allows growers to harvest before five years with a price deduction.
[34] There was no evidence of enforcement.

Table 11.2 gives summary details of the scheme with Advance Agro. Schemes offered by the other two companies are very similar.

Sampling approach for primary data collection

Primary data were collected through a household survey conducted by the author in four contract eucalypt-growing regions in Thailand. The household survey contacted the following groups.

- Both contract eucalypt growers (292) and non-contract growers (169) were contacted prior to their first eucalypt harvest.[35] This group provided household-level information on socio-economic characteristics, and smallholders' perceptions of the attributes of contract eucalypt farming to understand the reasons for adoption and the factors correlated with adoption.
- Also contacted were 82 contract eucalypt farmers and 81 non-contract farmers who had farmed eucalypts for at least one rotation. This group provided information on some specific impacts of the contracted activity compared with non-CF. It was necessary for the surveyed eucalypt growers who had farmed eucalypts for at least one rotation to be targeted so that impacts were identifiable.

The three pulp and paper companies identified earlier facilitated the research by identifying the geographic zones in which they operated, and providing lists of the villages where eucalypt growers were located. Villages in which surveys were carried out were selected at random from these lists by the author.

The fieldwork was organized so that one *moo*, which is the administrative subdivision of a village in Thailand, could be surveyed in a day. The head of the village was first visited and told about the research. The team of interviewers would split up at the temple, walk off in different directions and survey one out of *n* households. The number *n* was determined by dividing the number of households provided and the number of respondents to be interviewed.

11.2.3 Assessment on the effectiveness of contract arrangements

The assessment on the effectiveness of contract arrangements is focused on two aspects: (i) the provision of good-quality plants; and (ii) the provision of extension support to small farmers. Results for both are detailed in the next subsections.

Effectiveness of contract farming in providing good-quality plants to small farmers

A larger proportion of contract eucalypt growers than non-contract ones preferred plants supplied by the contracting company to any other source (research results, 2010).[36] The reasons that contract growers cited for adopting contracts were recorded, and they are presented in Table 11.3. This open-ended question of the household survey showed that 70 percent of contract growers adopted a contract for the provision of plants (among other reasons).

[35] The sampled contract eucalypt growers had only adopted contract tree farming in the last three years so that the harvest had not yet impacted their livelihood.

[36] Obtained from multiple logistic regression model of adoption of contracts for eucalypt farming on the supply of preferred plants and including the regions as independent variables.

TABLE 11.3
Ranking of reasons cited by contract eucalypt growers for adopting a contract for growing eucalypts

Motivation	Percentage of contract eucalypt growers (n = 292)
Market security	73
Provision of better-quality or cheaper plants	70
Provision of technical advice	69
Price security	62

Note. These results are calculated from answers to household survey open-ended question Q.45. Percentages add up to more than 100 because the questions were opened and respondents were encouraged to give more than one reason.
Source: author's calculations.

In most cases, contract growers had access to clones that they could not purchase on the open market. The key advantage of clones (tissue culture and rooted cuttings) is to achieve higher yields. However, since their cost is higher than traditional seedlings, it discourages some small farmers. Eucalypt growers who preferred plants supplied by sources other than the company (for example, a private eucalypt nursery) were less interested (if not totally disinterested) in being a contract grower. "Now I think the price of plants from the company is very expensive. So I have to buy the cheap plants from another place." Eucalypt growers thought that the plants supplied by the company were very expensive (3 baht each) when they could find cheaper ones (0.60 baht each) from other sources. Since the growers were non-contract, they were free to buy plants supplied by any source.

A large proportion of eucalypt growers were signing contracts only to have access to the company's plants since this was compulsory in order to buy these better-quality plants. Eucalypt growers who wished to source their plants from the company usually needed to go to the mill or one of the company's extension centres. A major constraint to this was the distance and, often, the lack of transport. The company was far away, and the expense of going to the company to get plants was too high. This was usually expressed through statements such as: "We have to drive to Kamphaeng phet to buy plants" (focus group no. 1 in a village located 50 km from Siam Forestry in Kamphaeng phet), and the same constraint was reported in other regions (for example, in a village located 27 km from Phoenix Pulp & Paper). A possible solution that was not reported to have been used was to wait for others in order to share the expense of renting transport. A solution that was actually used was to order from people who were going there with their own vehicles.

This section has established that the source of preferred plants was correlated with the adoption of contracts and some eucalypt growers would contract in order to access better-quality plants. These results were confirmed by the analysis of the sample of growers who had already harvested eucalypts. The analysis of the type of plants used has revealed that a greater proportion of non-contract eucalypt growers used seedlings (35.1 percent of non-contract eucalypt growers against 19.7 percent of contract growers) rather than clones (Table 11.4).

TABLE 11.4
Type of plants used among contract and non-contract eucalypt growers (block plantation)

	Percentage of contract eucalypt growers (n = 61)	Percentage of non-contract eucalypt growers (n = 57)	Percentage of all eucalypt growers (n = 118)
Seedlings*	19.7	35.1	27.1
Tissue culture plants**	65.6	38.6	52.5
Rooted cutting plants	14.7	26.3	20.3

* p<0.10; ** p<0.01
Differences between groups were tested using a chi-square test on contingency tables.
Source: author's calculations.

Effectiveness of contract farming in providing extension support to small farmers

Key results in relation to extension support are presented in Table 11.5. They include the following: (i) a larger proportion of contract eucalypt growers received general or specific technical advice; (ii) contract and non-contract growers had similar problems with the establishment of plantations; (iii) a larger proportion of non-contract growers encountered problems with eucalypt establishment; and (iv) a larger proportion of non-contract growers had specific problems with mature plantations and especially with fires on their plantations. These two latter results can be explained by the better plantation management practices followed by contract growers on the company's advice. For instance, when smallholders want to establish eucalypts under contract, a company extension officer checks the suitability of their land, therefore reducing the risks with plantation establishment.

One non-contract eucalypt grower reported that he stopped growing eucalypts because a fire destroyed the plantation and he had to sell the remaining eucalypts to an intermediary at a low price. During the qualitative data collection, smallholders identified a causal link between the lower weeding/pruning and higher loss caused by fire. This was further investigated and quantitative results supported this explanation by showing that a larger proportion of non-contract growers did not hire a professional to prune the plantation (Boulay, 2010).

A statistically significant larger proportion of contract tree growers had problems of fungus (Table 11.5 and chi-square test on contingency tables in Boulay [(2010)]). This was explained by the fact that a greater proportion of contract tree growers used tissue culture plants (65.6 percent against 38.6 percent of independent tree growers), which are more vulnerable to fungal pathogens (Table 11.4). The narrow genetic base of *E. camaldulensis* planted in Thailand is said to be the main reason for leaf and shoot blight caused by *Cryptosporiopsis eucalypti*, the most widespread fungal pathogen (Thaiutsa, 2002). A previous study by Thaiutsa found that one-third of eucalypts are susceptible to *C. eucalypti* and growth rate is always affected. This implies that technical risks are higher for tree growers using tissue culture or rooted cutting plants. The analysis of the type of plants used has revealed that a greater proportion of contract tree growers than independent ones used these

TABLE 11.5
Technical problems encountered by contract and non-contract eucalypt growers and specific help received

	Number of contract eucalypt growers (n = 82)	Number of non-contract eucalypt growers (n = 81)	Difference between the two groups tested with chi-square tests on contingency tables
ADVICE RECEIVED			
Number of eucalypt growers who received general or specific technical advice (all sources included)	57	32	0.000***
Specific assistance received for problems with plantation establishment			
▪ none	9	15	0.184
▪ from a neighbour or a friend	0	1	0.313
▪ from the company	2	0	0.157
Specific assistance received for problems with mature plantations (among growers who had at least one problem)[b]			
▪ none	48	61	0.003***
▪ from a neighbour or a friend	3	4	0.729
▪ from the company	8	1	0.013**
TECHNICAL PROBLEMS ENCOUNTERED			
Number of eucalypt growers who had a problem with establishment of the plantation[b]	22	33	0.060*
Origin of this problem (among those who had a problem with establishment)			
▪ poor-quality plants	7	9	0.581
▪ saline soil	3	5	0.457
▪ insufficient water/rain	1	1	0.937
Problems with the mature plantation			
▪ insects (worms, beetles)	27	28	0.825
▪ weather shocks	8	8	0.979
▪ fire	27	37	0.002***
▪ wood stolen	15	11	0.411

[b] n = 62 contract eucalypt growers and 64 non-contract growers who had at least one problem with plantations.
Differences between groups were tested using chi-square tests on contingency tables.
*** p<0.01; ** p<0.05; * p<0.10
Source: author's calculations.

plants. Technical assistance cannot help to resolve problems caused by fungus.[37] The sources of technical problems were further explored (Boulay, 2010) and it was found that a lower proportion of contract tree growers used herbicides. This could also explain why they generally had more problems with fungus.

In addition, during in-depth interviews, tissue culture and rooted cuttings were generally reported to achieve higher yields for the first rotation, but to be riskier. Some contract tree growers complained about the quality of plants sold by Advance Agro, because plants had an unhealthy regrowth at the second rotation. Some growers also complained about problems they had with the first harvest: the yield was bad because many trees died and rooted cuttings were damaged by wind or rain.

These results confirm that: (i) one of the main reasons for adopting contracts is the provision of technical advice; and (ii) contract growers received more technical advice and so had fewer technical problems with their plantations. This also revealed that eucalypt growing is complex for smallholders: they need to know how to grow eucalypts based on good-quality information.

Fifty percent of non-contract eucalypt growers thought that their eucalypt plantation could have benefited from technical advice from the company. They perceived the company as experts with more information on eucalypt farming than they had, and wanted to share knowledge about farming eucalypts. They added that the company could analyse the soil better than they could, and could therefore advise them on the right plants for different soil types in order to make their eucalypts grow more quickly and produce better yields. They also thought that technical advice on silvicultural operations from the company could improve the quality of the wood. In all cases, it was clear that the contracting company provides contract growers with specific technical advice to mitigate eucalypt production risks. The risk of getting poor plants induces tree growers to adopt contracts. As well as growing techniques, the company could also advise on harvesting methods and provide information about prices.

11.2.4 External factors

Some external factors outside the control of the direct parties involved in the contract are likely to affect the potential to establish and maintain contracts. In a policy analysis of existing research, Arnold and Dewees (1997; 1998) provide examples of external factors that modify the outcomes and therefore the adoption of contract tree growing.

- Subsidies and fiscal measures (e.g. subsidized planting stock, subsidies for competing land uses, price controls and fuelwood markets)
- Regulatory and tenurial measures (e.g. regulations controlling private production and sale, security of tenure)
- Public investment in research and support services (e.g. research, broader approaches to extension, strengthening the planning database) (Arnold and Dewees, 1998: 5).

[37] However, this result refers to cuttings bought at least three years before (because the tree growers surveyed for impacts had already harvested the eucalypts). The company's staff and tree growers reported that the clonal material currently used has already been improved and that the risks of fungal infection are not as high as assessed in the research (research interviews, 2008).

In Thailand, these external factors include: (i) land tenure; (ii) access to external credit; (iii) local government extension; (iv) cost of transport; and (v) availability of alternative marketing channels. They are dealt with in the following subsections.

Land tenure

In Thailand during the nineteenth century, as in many other countries in Southeast Asia, all land belonged to the King and farmers had usufruct rights to cultivate it. Nowadays, the Government of Thailand distinguishes between private and public land[38] (Onchan, 2002). Half of the country is public land, including gazetted forest land, military land, crown property, lakes, waterways and roads. Forest land (around 40 percent of the country) is under direct control of the RFD. Since 1975, the Agricultural Land Reform Office (ALRO) has tried to legalize the occupants of national forest reserve lands by relocating them from the forestry sector to "agriculturally suitable lands" (Onchan, 2002). Between 1975 and 2001, ALRO gave approximately 1.18 million farmers land tenure rights to over 3.12 million ha of land previously considered forest land (Onchan, 2002).

Tree farming can be a way to make land registration claims on forest land in Thailand (Wannasai and Shrestha, 2008). Historically, private ownership of upland areas has been granted to the people who had cleared forest land to cultivate it (Ammar, Setboonsarng and Patamasiriwat, 1991). For instance, the first to clear the land "gained complete rights of use and disposal" within the Blue Miao (Hmong Njua) of Thailand (Geddes, 1976: 149). There are still people living inside forest reserve areas and without any land titles who grow perennial crops (for example, rubber) to claim official land documents. Households hope to obtain land reform certificates from the RFD (Puntasen, Siriprachai and Punyasavatsut, 1992; Wannasai and Shrestha, 2008).

> *These farmers make land-use decisions based not only on their existing right to use the land but also based on the expectation of being granted secure title in the future. Some households residing inside forest reserve areas and without any land titles at all have also planted perennial crops in order to make land registration claims. These areas are under the jurisdiction of the Royal Forest Department, and the intention is clearly to obtain land reform certificates of such cultivated lands* (Wannasai and Shrestha, 2008: 218).

> *Unlike the "squatters" whose land can be taken at any time by the government, the eucalyptus planters are given "guarantee" of perception of the lessees that the land will not be taken away by the RFD. In general, if squatters are not evicted from their lands, they can expect proper land title given to them* (Puntasen, Siriprachai and Punyasavatsut, 1992: 193; Wannasai and Shrestha, 2008).

The country outside the forest estate is under, or eligible to be under, private ownership. Thai households with full ownership rights perceive their land tenure to be secure and were found to grow perennial crops as an alternative to agricultural

[38] Communal ownership or control of land is not granted by the Thai tenure system.

crops. The expectation of higher profits was also a main motivation to adopt perennial crops (Wannasai and Shrestha, 2008).

In 1954, the Land Act recognized a range of legal land titles in Thailand. The main titles are Nor Sor Sii (NS-4 – full title deeds); Nor Sor Sam (NS-3 – transferable certificate of use); Nor Sor Song (NS-2 – temporary occupation certificate); and Sor Kor Nung (SK-1 – a claim certificate unusable as collateral) (Barney, 2005). Until the beginning of a Land Titling Project, the Land Department did not have sufficient resources to investigate and attribute full ownership rights to most agricultural land (Onchan, 2002). Most farmers could not meet the expense of getting a legal land title. In order to give access to land to rural people seeking to make a livelihood in the agriculture sector (Onchan, 2002), Thailand started a Land Titling Project in 1984 (Rattanabirabongse *et al*., 1998; Barney, 2005). This project has distributed degraded lands to farmers (Wannasai and Shrestha, 2008) and issued them with limited-use rights certificates (as opposed to full ownership rights) such as Sor Tor Kor (STK) delivered by the RFD, and Sor Por Kor (SPK 4-01) delivered by ALRO. Land titles given under the Land Reform Project are usually transferable only through inheritance and cannot be sold. These titles provide cultivation rights for up to 15 rai (2.4 ha) per household and, usually, trees have to be planted on 20 percent of the land (Vandergeest and Peluso, 1995). Households whose land is from the Land Reform Project seemed to consider their temporary tenure secure enough to grow perennial crops (Wannasai and Shrestha, 2008).

This study found that neither the perception of land tenure security nor holding a formal land tenure document matters in the adoption of contract tree growing in Thailand.

Access to external credit

In Thailand, none of the contractual arrangements from the three companies include any provision of credit (and in most cases not even credit in kind, for example, inputs that are deducted from the purchase price). Table 11.6 presents the sources of capital used by tree growers to invest in eucalypt tree farming.

Most non-tree growers reported that they used the savings from other crops to repay their debts. The response of some tree growers, saying that they obtained investment capital from the Bank for Agriculture and Agricultural Cooperatives

TABLE 11.6
Sources of financial capital invested in eucalypt tree farming

Sources of capital	Percentage of tree growers (n = 461)
Savings from employment	50.3
Savings from the sale of crops	45.1
Credit from the Bank for Agriculture and Agricultural Cooperatives (BAAC)	12.6
Sold livestock	5.6
Informal credit	2.7

Source: author's calculations.

(BAAC), has to be interpreted with caution. BAAC only provides credit for annual crops and the amount is based on smallholders' land value. Although BAAC does not provide credit for eucalypt tree farming, some tree growers had used their credit for this purpose, knowing that BAAC rarely checks how the credit is used. During personal interviews, a few tree growers admitted not being entirely truthful with BAAC.

In the region of Ratchaburi in Thailand, the government has recently decided to promote eucalypt plantations on land from the Land Reform Project (research interviews, 2008). It provides credit to smallholders to start the plantations and advises them to contract with Siam Forestry.

In Thailand, tree growers did not follow the rotation they had planned. Contract tree growers had planned to harvest after four years and independent tree growers after three years and nine months (the difference between the two groups was statistically significant). On average, they waited only three years and five months (Boulay, 2010). The fact that all tree growers have harvested earlier than planned and earlier than recommended by the company shows that they were suffering from credit constraints.

The results suggest that the provision of a one-time credit at the time of establishment of the plantation would enhance the adoption of contracts by both non-tree growers and independent tree growers, but credit is not necessarily needed by most of them to establish and manage the plantations. Having credit to establish the plantation would only free up tree growers' own resources for investing in other goods and activities. However, providing yearly credit until trees are harvested would enhance the adoption of contracts. In addition, many tree growers cannot afford to pay for harvest and transport to the mill gate before they obtain the money from the sale of the trees, principally because they need the money for cultivating cash crops. The adoption of contracts could be increased by providing a one-time credit for harvest and transport to enable farmers to deliver the wood to the mill gate, which is more profitable for them than selling as stumpage.

Local government extension

Glendinning, Mahapatra and Mitchell (2001) tested hypotheses derived from diffusion of innovation theory and their sample of 428 households in eastern India provided evidence of it: adoption of agroforestry was driven by suitable information received from multiple sources (extension agents, neighbours, group meetings) rather than by the socio-economic characteristics of households. The type of communication channels used for extension was decisive and the most effective one was interpersonal contacts.

Thacher, Lee and Schelhas (1997) also tested hypotheses generated from diffusion theory in the context of a reforestation incentive programme in Costa Rica. Based on a survey of 243 farmers, they found that the frequency of visits by an extension officer and farmers' attendance at community meetings had a statistically significant positive influence on adoption. Costa Rican smallholders were over twice as likely to join reforestation programmes if they had previously received government technical assistance for other agricultural activities prior to enrolment. In addition, a Costa Rican smallholder who attended a workshop or field day to obtain information about the reforestation programme prior to enrolment was four and a half times more likely to participate.

In Thailand, no permission is required for companies to establish a CF scheme but the support of provincial agricultural offices is useful to encourage smallholders to adopt a contract for the first time (Singh, 2005). The Department of Agricultural Extension trains smallholders and local officials in CF and it promotes CF through the smallholders' associations rather than individuals (Singh, 2005). Two studies have concluded that the role of the state in CF is minimal and the state's role should be to regulate rather than promote CF (Siamwalla, 1996; Singh, 2005).

This research suggests that the provision of information and technical advice would facilitate contract tree farming. The most effective strategy for the government would be the provision of independent technical advice. Smallholders are not well informed about good silviculture and the real value of wood. The results of the research suggest that extension programmes may be the most effective way to promote CF for eucalypts in Thailand, where the poor reputation of eucalypts limits their adoption. Research supported the outcomes of a recent FAO workshop at which participants from Thailand identified priority areas for better management of planted forests. They pointed out that information and technical advice available to smallholders – on silviculture, inventory and management – as well as the processes for information transfer via networks were inadequate, and recommended initiating a process to determine which type of information should be delivered, and the staffing levels, budget and procedures required to deliver information to smallholders (FAO, 2008). They also believed it was desirable to establish regular training for forestry extension staff to ensure that the information delivered was current and consistent (FAO, 2008). It was clear from participants' contributions that, in the Thai situation and in other similar ones, the provision of extension and training is an effective way for the government to facilitate good management of smallholders' plantations, enhance the profitability of tree growing for smallholders and, consequently, support the pulp and paper industry.

Extension can be relatively inexpensive, but it needs to be supported by applied research into eucalypt tree farming, such as in tree improvement, site selection and soil management within the context of sustainable land use (Harrison and Herbohn, 2001). Government could assist the realization of more sustainable outcomes by establishing programmes that assist smallholders to assess and monitor the suitability of land for planting (FAO, 2008). In many countries in which smallholders grow trees, international development agencies may also be able to contribute to relevant research and training. The involvement of different stakeholders in extension should be beneficial.

> *Fieldwork has generated a new and more adequate version of the extension approach and it is now recommended that extension be more focused on the involvement of a diversity of institutions to work as extension agents* (Christoplos, 1996).

Cost of transport

Another key external factor (beyond the control of the direct parties to the contract) affects the likelihood of establishing and sustaining procurement contracts linking small farmers to the pulp and paper industry: the cost of transport.

The quantitative analysis showed that, when controlled for the region, contract eucalypt growers generally owned larger areas of land than non-contract growers.[39] Although companies offer contracts regardless of the size of the land planted with eucalypts, size is positively correlated with contract adoption. This positive correlation resulted from the existence of economies of scale. Eucalypt growers wanting to enter into a contractual agreement would have to hire a car (if they did not own one) to drive to the mill or one of the company extension centres to pick up the plants. Some growers said that it was cheaper to buy in their province[40] because petrol was so expensive, or that they would go if they had a car. Others said they could wait for others to share a car rental to go there with them, while others said that a friend went and took the orders. The price of plants was not compensated for the distance from the farm to the mill.[41] In some cases, driving to the company mill to buy eucalypt plants was perceived as not worth it, because the area to be planted with eucalypts was too small. In relation to the area of land dedicated to eucalypts, eucalypt growers surveyed had from 50 to 100 rai of eucalypts; the mean was 0.7 ha (4.37 rai) and 86 percent of eucalypt growers surveyed grew less than 3.2 ha of eucalypts. Twenty percent of non-contract eucalypt growers reported that their area under eucalypts did not seem large enough to adopt a contract (Boulay *et al.*, in preparation), so because of their limited area, they did not adopt contracts (even though, in Thailand, companies do not require a minimal area of eucalypts to be planted). While the idea of non-contract eucalypt growers was often associated with having only a small area of land under eucalypts, contract growers were associated with having larger areas where it was therefore worthwhile to adopt a contract.

Larger-scale eucalypt growers valued the benefits of the contract more because plants and technical advice were even more necessary. We conducted a quantitative test of the correlation between the area of eucalypts planted and the adoption of contracts. These variables were correlated: when controlled for the region, contract eucalypt growers had generally planted a larger area of eucalypts.[42] These quantitative and qualitative results supported the importance of the cost of transport in contract adoption.

Availability of alternative marketing channels

Some of the literature on contract agriculture argues that contract growers are exploited (Wilson, 1986; Clapp, 1994; Little and Watts, 1994) and points out the dangers (for instance, poor bargaining position – Key and Runsten, 1999; Singh, 2002; Warning and Key, 2002). The evidence from this study suggests that contractual arrangements for eucalypt growing in Thailand are fair and that Thai growers who grow eucalypts under contract are not exploited. Furthermore, they do not face a risk of expropriation or hold-up, as contract agriculture sometimes does, because of

[39] Obtained from multiple logistic regression model of adoption of contracts for eucalypt farming on the extent of land owned and including the regions as independent variables.
[40] There were also local travelling stores that sold plants within the village itself.
[41] Further research should test whether the distance to the company nursery or extension centre is negatively correlated with the adoption of contracts.
[42] Obtained from multiple logistic regression model of adoption of contracts for eucalypt farming on the extent of land planted with eucalypts and including the regions as independent variables.

a key condition related to the market context, which is very different from the usual monopsonistic markets (one or few buyers) in place for contracted crops – there are stable prices, and there is high demand and a strong system of intermediaries.

The schemes studied confirm a previous result obtained in the case of contract vegetable farming in Northern Thailand: contract schemes can develop even when there is competition between input providers (Sriboonchitta and Wiboonpoongse, 2008). In the context studied, there is also competition between buyers of wood, and Thai tree growers have the option to sell independently (since the open market is accessible to them). In Thailand, competition between wood buyers (companies and intermediaries) is probably important in enhancing the fairness of CF schemes because the increasing rivalry for raw materials among buyers has been an incentive for companies to enhance their efforts to promote and improve their services to contract tree growers. Intermediaries help introduce the competition that is critical for properly functioning economic systems. Makarabhirom and Mochida (1999) argue that the arrival of new buyers on the scene should make companies respond to competition by offering more attractive contractual arrangements to contract tree growers, so that they stay loyal. This confirms previous results for potatoes, seed and vegetable CF in Thailand (Sriboonchitta and Wiboonpoongse, 2008).

This situation shares some similarities with the Bulukumba district, in the south Sulawesi province of Indonesia. Race *et al*. (2009) describe a supply-purchase agreement according to which tree growers are given free seedlings, without the compulsion to sign a contract, and expected to sell their wood back to the company at the time of harvest. This is exactly what the Phoenix Company in Thailand used to do before they started issuing contract documents in 2005. Tree growers in both contexts would frequently sell the wood to intermediaries who would then sell to the company. In Thailand, Phoenix Pulp & Paper introduced a more formal agreement when competition with another company (Advance Agro) increased. Advance Agro started contracting farmers further away from their mill and closer to the Phoenix mill.

In Thailand, developed and competitive markets constitute conditions for the success of contract tree farming. The conditions identified confirm previous empirical results in Australia and Indonesia (Race *et al*., 2009).

11.3 CONCLUSIONS AND RECOMMENDATIONS

From this paper, we can infer what actions might be taken to increase the role that CF plays in helping to improve the access of small farmers to more remunerative markets. Above all, contracting companies could provide more and better technical advice. Strong variations in plantation management practices have been observed in Thailand as in other case studies, for instance in South Africa (Cairns, 2000). If the Thai case study companies could assist farmers to improve yields through the provision of technical knowledge, both eucalypt growers and companies would benefit.

> *The species used by non-contracts are slower growing than modern clones now propagated, fertilizer weeding inputs may also be lower. Yields are probably considerably lower than those achieved among outgrowers* (Cairns, 2000: 39).

In addition to improving their extension support, contracting companies could provide credit. A striking difference between the three schemes studied in Thailand

and many other schemes in forestry and agriculture is the absence of credit provision. This difference contradicts previous empirical studies that have found that the main incentive for farmers to adopt contracts was the provision of credit for agriculture in both Thailand (Sriboonchitta and Wiboonpoongse, 2008) and the Dominican Republic (Raynolds, 2000), and for tree farming in the tropics (Pokorny, Hoch and Maturana, 2007: 18). CF for eucalypts in Thailand implies the purchase of genetically improved planting material, which is more expensive than standard seedlings (for instance, three baht each against 0.6 baht). The results suggest that the provision of either a one-time credit at the time of establishment of the plantation or yearly credit until eucalypts are harvested would enhance the adoption of contracts by both non-eucalypt growers and non-contract eucalypt growers. However, credit provision has some negatives for companies, such as transaction costs and risks associated with broken contracts. Cases of these are widely reported in contract agriculture and companies sometimes prefer to provide inputs other than credit (as noted in research based on secondary data carried out by Glover, 1984 and FAO, 2001).

These results also show that the costs of driving to the mill to buy eucalypt plants should be taken into account by companies as a real constraint to the adoption of contracts by small-scale eucalypt growers. The three companies surveyed are planning to establish plant distribution points in local areas, close to farmers interested in eucalypt growing. Phoenix Pulp & Paper is planning to increase the number of plant distribution points, principally located near a main road, and to add advertising boards (research interviews, 2009).[43] Our results confirm that this strategy will enhance the adoption of contracts.

In addition, the quality of extension work is crucial to adoption, and is directly under the control of companies. Some non-eucalypt growers argued that they did not know where to buy eucalypt plants, and thought that they would grow eucalypts if there were a company that bought the wood around the area when there actually was such a company. In order to enhance the adoption of eucalypt farming, companies should focus on extension. They need to gain smallholders' trust by adapting extension based on their in-depth understanding of local culture and traditions. They should provide smallholders with the information, if not the confidence, to start growing eucalypts; visit non-eucalypt growers and non-contract eucalypt growers to explain to them the terms of the contract; and also visit their contract eucalypt growers regularly to ensure that they are satisfied, in order to maintain or regain a good reputation.

Provision of information about eucalypt growing is necessary to improve the reputation of this crop and attract non-eucalypt growers. For instance, the company could sponsor a study of the environmental impacts of eucalypts on the soil from an independent research provider. Although the potential for extension on eucalypt farming seems high, companies should also take into account the bad reputation of the impacts of eucalypts on the soil as a limitation on the expansion of eucalypt plantations and, therefore, on the sourcing of their supply of raw material.

[43] The company sees selling plants as a way to lock farmers into being contracted.

Companies should visit non-contract eucalypt growers and provide technical advice in order to interest them in contracts. The research confirmed the findings of Wiboonpoongse *et al.* (1998), who acknowledge the successes achieved by CF, but also point out the need for eucalypt growers and contracting companies to readjust approaches according to the socio-economic environment, while keeping production internationally competitive. Farmers' understanding of the contracted activity should be enhanced through the delivery of more information about the company's production objectives and the anticipated returns and risks of this activity. Good relations between company and farmers are crucial for the success of CF in Thailand (Wiboonpoongse *et al.*, 1998). In this context, it is desirable and advantageous for companies to continue trying to interact directly with smallholders to provide them with technical advice.

However, extension is costly and company attitudes need to be investigated in this regard. Phoenix Pulp & Paper was asked to what extent it is in its interest to invest in attracting more contract farmers (in preference to purchasing from non-contract growers), or rather to invest in information outreach to persuade more farmers into eucalypt farming (whether contracted or non-contracted). The company reported that promotion of both eucalypt growing and CF are important (and carried out simultaneously through extension). As the pulp and paper companies compete for land with other industries (such as with sugar-cane companies), it is always important for the company to promote technical knowledge and explain the profitability of eucalypts compared with other crops.

This research has demonstrated that CF is effective in providing good-quality plants that achieve higher yields, and in providing extension support to small farmers. Results are achieved by the better plantation management practices followed by contract growers on the company's advice. It is clear that the growing of eucalypts is complex for smallholders and consequently they need the best current information and advice in order to achieve the necessary skills to grow eucalypts well.

Although companies offer contracts regardless of size of the land planted with eucalypts, contract eucalypt growers generally owned larger areas than non-contract growers because of the existence of economies of scale. The costs of driving to the mill to buy eucalypt plants as well as the cost of clonal planting material are often prohibitive for the poorer farmers. To some extent, these costs reduce the effectiveness to which contracts can help farmers to access modern/more demanding markets for eucalypts.

Together with the cost of transport, other external factors were likely to affect the potential to establish and maintain contracts, namely access to external credit, local government extension and availability of alternative marketing channels. There was no influence from land tenure.

It is hoped that this research has provided a useful input to decision-making aimed at enhancing the contribution of contract tree farming to smallholders' livelihoods. Companies should focus on extension in order to attract more smallholders to eucalypt tree growing, and they need to make the contracts sufficiently attractive for tree growers to adopt them. Governments should provide information and technical advice in order to facilitate contract tree farming.

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CONTRACT FARMING
FOR INCLUSIVE MARKET ACCESS

Recent transformations in agrifood systems have created new technical requirements and compliance costs that make it increasingly difficult for resource-poor farmers to access modern market channels. In this respect, the question of whether contract farming can be an effective institutional mechanism to address this issue stands out as one of special relevance.

This book aims to typify the extent to which contract farming is helping small farmers to access markets and meet stringent requirements of manufacturers, retailers, exporters and service firms, from both food and non-food sectors such as biofuels and forestry. It seeks to clarify differences in the functionality of contracts depending on commodity, market, technology, public policies and country circumstances. Conceptual issues are discussed and real-world case study appraisals from developing regions are presented. The issues raised in the case studies and the key messages synthesized in the initial chapter bring new insights and contributions to further enrich knowledge on contract farming as a tool for inclusive market access in developing countries.

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