

Contract Farming

Risks and Benefits of Partnership between Farmers and Firms

Contract farming involves production by farmers under agreement with buyers for their outputs. This arrangement can help integrate small-scale farmers into modern agricultural value chains, providing them with inputs, technical assistance, and assured markets. Critics contend that contract partners may subject farmers to abuses. The literature shows that in fact contract farming can raise farm income, but mainly for high-value crops. It also indicates that in many cases firms are willing to work with small farms. This note confirms that conflicts are common between buyers and farmers, and that alternative dispute resolution methods may help resolve them.

Government intervention in agricultural marketing has declined in recent decades as private firms have become more involved in the trading, storage, processing, and export of agricultural products. Market reforms have allowed for the expansion of contract farming, in which agro-enterprises contract farmers before planting to supply specific agricultural products, sometimes providing technical assistance, inputs on credit, and an assured market (Gulati et al., 2006).

Some analysts see contract farming as a solution to a number of constraints that limit the productivity and income of small-scale farmers in developing countries, including lack of credit, limited information about production methods, market risk, and poor market linkages. In this view, contract farming can help farmers move from subsistence production of low-value staple

foods to commercial production of higher-value crops, allowing them access to the wider economy and raising their income (Eaton and Shepherd 2001).

Countering the favorable view of contract farming, there are concerns that firms may exclude small-scale farmers, preferring to work with a smaller number of larger farmers, thus exacerbating rural income inequality. Other analysts argue that where companies work with smallholders, the imbalance of power and information between them enables agribusiness firms to impose contract terms on small farmers, manipulate quality standards to reduce payments to farmers, and renege on agreements if market conditions change (Glover 1984; Little 1994).

This note draws upon a growing body of empirical research on contract farming in developing countries in examining how contract

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farming affects the well-being of participating farmers and whether the practice tends to exclude small-scale farms. Resolving frequent conflicts between farmers and firms through the legal system is costly and time-consuming. This note, therefore, explores the experience of alternative dispute resolution (ADR) mechanisms in resolving issues out of court.

Companies, crops, and conditions best suited for contract farming success

Reliable figures are not yet available on the number of farmers in developing countries participating in contract farming. Informal estimates suggest that as many as one-quarter of Kenyan farmers may be on contract. But rates in most countries are probably much lower. Farm surveys in Ghana, Uganda, and Vietnam suggest that less than 5 percent of farmers participate in contract farming. A seven-country study by the World Bank Group found that only 7 percent of sampled households were involved in any type of agricultural production contract, including informal agreements with traders (Losch et al. 2011, 157).

The prevalence of contract farming varies widely by type of buyer, destination market, and commodity. Contracting firms are almost always relatively large processors, exporters, or supermarket chains. Rarely do small-scale traders or even wholesalers offer farmers pre-planting contracts. This is not surprising given the large fixed costs associated with contracting. Firms must establish a network of trained field agents who recruit farmers, provide advice, monitor compliance, and organize collection of the harvest. Large firms have a bigger incentive to ensure a steady supply of raw materials, readier ability to extend credit, and greater capacity to absorb the risk associated with offering a fixed price.

Contract farming arrangements are often created for markets willing to pay a premium for specific product attributes. Export markets and supermarket chains establish quality standards and demand products of a certain size, color, maturity, and flavor. In serving these markets, processors often need products to meet requirements in terms of uniformity and chemical characteristics. Seed companies require that their growers multiply seed under carefully

controlled conditions to avoid contamination with seed from other varieties or crops. In these situations it is easier to communicate and enforce quality requirements if the buyer contracts farmers to grow the product. In contrast, there is less incentive for buyers to contract farmers when the product will be sold as a staple food for price-sensitive consumers.

The prevalence of contract farming differs substantially across commodities. Contract farming is relatively common in the case of fruit and vegetable production for export or sale to domestic supermarket chains, as is the case in Kenya, Madagascar, and Senegal. Many traditional agricultural export crops such as tea, oil palm, and rubber are often grown on “nucleus estates,” company-owned plantations surrounded by independent growers who produce under contract. The Kenya Tea Development Agency, a private firm, has one of the largest contract farming networks in the world, with more than 500,000 small-scale growers. Commercial poultry production is often carried out under contracts in which a firm provides chicks, feed, and other inputs to the farmers and commits to buying the chickens when grown. Cases of contract poultry production have been documented in Bangladesh, India, Indonesia, and Thailand. Milk production is often organized contractually by a dairy processor to coordinate the supply of this highly-perishable product. Reforms in India have transformed the milk sector, as the role of private processors, some of whom offer contracts, has grown dramatically relative to the dominant dairy cooperatives (Birthal et al. 2008).

Contract farming is rarely used in the production of staple cereals, roots, and bean crops. This is presumably because buyers are less quality sensitive, and markets are widespread, so spot markets are able to coordinate supply and demand without the additional costs associated with contract production. Exceptions include barley for large-scale breweries, grain seed production, and niche products such as organic rice.

Increased income for contract farmers

Early studies of contract farming observed that farmers appeared to earn higher incomes than

their neighbors who were not on contract (Glover 1984; Minot 1986; Little 1994), but these studies did not establish causality. Later studies used econometric analysis to control for education, farm size, and other observable characteristics that might contribute to income differences between contract farmers and others. Some factors, such as skills and industriousness, are not easy to measure. The most rigorous studies have used instrumental variable analysis, resulting in estimates of the impact of contract farming alone. Table 1 summarizes the results of rigorous

econometric studies measuring the impact of contract farming on income and revenue. The estimated change in income for contract farming over the average income for non-contract farming in all these studies ranges from negative 49 percent to an increase of 600 percent. Most found an increase of between 25 and 75 percent. This sizable income increase is not surprising given that contract farming ventures which do not provide farmers higher incomes (or some other benefit, such as more stable income) are likely to lose farmers and eventually fail.

Table 1 Studies examining the impact of contract farming on income or revenue

Study	Location	Commodity	Results
Warning and Key, 2002	Senegal	Groundnuts	Heckman selection model used to estimate increased income. Increases in gross agricultural revenues are 55% greater than average non-contacting farmer. Participation in contract farming associated with 39% increase in gross agricultural income over non-contract farmers.
Simmons, Winter, and Patrick, 2005	Indonesia	Poultry; Maize; Rice	Contracting improves returns to capital for poultry and maize seed, but not for rice seed. Contract farmers had 71% and 160% increase in gross margin for seed corn and poultry, respectively, over sample average.
Ramaswami, BIRTHAL, and Joshi, 2006	India	Poultry	Based on IV regression analysis, contract poultry growers earn 36% more per kilogram per production cycle than independent growers. They also had lower variability in gross margins between production cycles.
BIRTHAL Jha, Tionco, and Narrod, 2008	India	Dairy, Poultry, Vegetables	Treatment effects model finds that participation in contract production increases net revenue more than 80% compared to the average.
Bolwig, Gibbon, and Jones, 2009	Uganda	Coffee	Positive revenue effect for contract farmers compared to a control group on non-contracting farmers. With full information maximum likelihood (FIML) estimation, the average effect is a revenue increase of 75% in net coffee revenue relative to no contract participation.
Miyata, Minot, and Hu, 2009	China	Apples and Green Onions	Treatment effects model finds a 38% increase in income associated with contract farming. For apples, additional income is attributed to higher yields; in the case of green onions, prices received by contract farmers were higher than those received by non-contract growers.
Saigenji and Zeller, 2009	Vietnam	Tea	Propensity score matching approach used to control for effect of observable characteristics. Study finds that participation in contract tea production raises household income by 40% above that of similar non-contract farmers.
Jones and Gibbon, 2011	Uganda	Cocoa	Contract participation increased real net cocoa revenue by 58% to 168%, depending on the econometric model used.
Bellemare, 2012	Madagascar	Vegetables, Fruit, and Grain	A 1% increase in the likelihood of participating in contract farming is associated with a 0.5 percent increase in household income. This implies that the average effect has an upper limit of 50% of income. The study also found that participation also increases income from non-contract crops and from livestock production.
Ferguin, Anseeus, and D'Haese, 2012	South Africa	Fruit, Vegetables, and Poultry	Contract farmers benefit from a seven-fold increase in income, significant at 5% level, and better access to services and resources, and opportunities to participate in new markets. Participation remains limited, however, mostly involving the better-off farmers.
Cahyadi and Waibel, 2013	Indonesia	Palm Oil	Estimated contract participation increased net household income by 60% (significant at the 10% level). Results show that while contract farming has a significant positive effect on smallholder income overall, poorer smallholders are less likely to benefit.
Narayanan, 2014	India	Gherkins, Papaya Marigold, and Poultry	Participation in contract farming increased profits of gherkin farmers by 21%, papaya farmers by 32%, poultry farmers by 150%. Contract farmers in marigold earned 49% lower profits than they would have outside the contract farming venture.

Who's on contract? Small farms in the mix

Do companies that contract farmers prefer medium- and large-scale farmers? A review of the evidence suggests that in many cases companies are willing to work with small farmers, but that some crops have economies of scale that favor medium- and large-scale farmers. Most studies detect no significant difference in farm size between contract farmers and other farms in a given region, a finding that points to a role for contract farming in inclusive growth and poverty reduction.

As shown in Table 2, several studies have found that farm size was not a significant determinant of participation in contract farming, and several more found that contractors actually preferred smaller farmers (Miyata et al. 2009; Key and Runsten 1999; Warning and Key 2002; Birthal et al. 2005; Shankar et al. 2010). Other studies have found that contract farmers were larger than average (Guo et al. 2002; Wang et al. 2010). The contrasting results may be partly explained by commodity. For example, in Indonesia contract seed growers tended to be larger than average, while contract poultry farmers were smaller than average (Simmons et al. 2005). Another study found that contract poultry growers were younger and less experienced than non-contract growers, implying that contracting made it easier to enter and learn the business (Ramaswami et al. 2006). The case study literature indicates that

contractors may shift strategies over time as they gain experience or as market conditions change. Tomato contractors in Mexico shifted from large- to small-scale farmers, while vegetable exporters in Senegal and pineapple exporters in Kenya gave up contract farming in favor of plantation production (Runsten and Key 1999; Maertens and Swinnen 2007; Minot and Ngigi 2004). In summary, the evidence suggests some contractors prefer to work with large-scale farmers, but many production plans involve small-scale farmers. Although working with fewer large-scale farmers reduces transaction costs, this is often outweighed by the higher overall costs and lower productivity of wage workers as compared to small-scale family farms.

Resolving contract farming disputes

Conflicts between contractors and farmers are frequently about quality standards and price. If market prices rise, contracted farmers may be tempted to sell on the market rather than to the buyer. Contractors may be tempted to falsify quality testing as a way of reducing the price they pay to farmers under contract, particularly when market prices have fallen. In many countries, settling disputes through the legal system is impractical because of costs and delays. Alternative dispute resolution mechanisms are one way to address these conflicts. ADR refers to any process for resolving conflicts outside standard legal

Table Determinants of participation in contract farming

Study	Location	Commodities	Results
Warning and Key, 2002	Senegal	Groundnuts	Asset ownership is not a significant predictor of contract participation.
Miyata, Minot, and Hu, 2009	China	Apples and Green Onions	A probit model for the participation in contract farming shows no preference for larger farmers.
Cahyadi and Waibel, 2013	Indonesia	Palm Oil	Migrant status, household head age, plot size, and time since farm establishment are all significant predictors of participation in contract farming.
Saenz and Ruben, 2004	Costa Rica	Chayote	Younger, less experienced growers were more likely to grow under contract.
Simmons et al., 2005	Indonesia	Poultry; Maize; Rice	Irrigation, age of head of household, and education were all found to be positive indicators of participation in contract farming across three sites in the country.
Guo et al., 2005	China	Fruits, Vegetables, Tea, Livestock	Specialization and commercialization along with distance from market and government support are shown to be significant predictors of the likelihood that farmers engage in contract farming.
Birthal et al., 2008	India	Dairy, Poultry, Vegetables	Experience and non-farm income are found to be significant indicators of contract farming for the dairy, vegetable, and poultry industries.
Wang et al., 2011	China	Vegetables	Risk attitudes are found to be a significant determinant of contract farming, with more risk-tolerant farmers preferring contracts.

procedures, including mediation and arbitration. This could involve a parallel legal structure which offers streamlined ADR such as that established by the Agricultural Produce Marketing Act in India in 2003. The Act has allowed 14 states to set up resolution authorities required to render judgment within 30 days (Pultrone 2012). In many other cases globally, relations between the firm and contract farmer are facilitated by an intermediary, such as a village leader, extension agent, or non-governmental organization. Third-party verification of product quality can also be used to prevent, but also to help resolve disputes as part of an ADR mechanism.

Rigorous impact evaluations of ADR on the success or sustainability of contract farming are rare and focus primarily on the role of third-party verification (see Table 3). One study provided vouchers to randomly-selected dairy farmers in Vietnam, allowing them to verify quality with a third-party laboratory. These lab tests showed that the company was not falsifying quality, and the reassurance of the third-party testing incentivized voucher recipients to increase output, resulting in increased dairy revenue by 16 percent (Saenger et al. 2013).

A second study looked at contract farming of Fair Trade cotton in Mali and found that third-party enforcement of contract terms improved cotton quality (Balineau 2013). A third study used field experiments to show that farmers do not fully trust their contractors, but the presence of a third party at the quality testing increased trust in the validity of the results. The level of trust of male farmers was not affected by opportunities for collusion between the company and the third-party testers, while the trust of female farmers was

negatively affected if such opportunities existed (Torero and Viceisza 2013).

Conclusion

Contract farming can link farmers to a processor, exporter, or supermarket chain. It can offer technical assistance, deliver inputs on credit, and reduce market risk, solving a number of constraints that limit small-farm productivity and income. Studies of contract farming in developing countries suggest that it almost always results in higher income compared to that of similar farmers not on contract. In most of the econometric studies of contract farming, incomes of participating farmers are raised 25 to 75 percent over those of similar farmers outside contract farming arrangements.

A few studies have found contracting companies that prefer to work with larger farmers, but most find no difference in farm size between contract farmers and other farms in the region. This suggests a role for contract farming in inclusive growth and poverty reduction. Of course, farmer participation in contract farming is often based on criteria other than farm size, including experience, location near the processing plant, and attitudes to risk. Ownership of equipment, such as pumps to allow year-round production, is also a factor. There are few if any cases of successful contract farming of cereals and other basic staples. Thus contract farming should be considered an institution that has a positive effect on farmers, but not one that is readily applicable in some important sub-sectors.

The two most common problems faced by contract farming ventures are side-selling by

Table **The impact of third-party verification on contract farming**

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Study	Location	Commodity	Results
Balineau, 2013	Mali	Cotton	Contract farming enforced by third-parties fosters the adoption of innovative agricultural practices. Results indicate a 2.4% to 7.7% increase in higher quality cotton being produced by contracted farmers.
Saenger et al., 2013	Vietnam	Dairy	Experimental design shows that contract farmers invest significantly more inputs into production and produced higher levels of output in the presence of independent quality verification.
Torero and Viceisza, 2013	Vietnam	Dairy	Male and female dairy farmers are found to differ in trusting the presence of a third party observer on product quality in the face of potential collusion. Male contract farmers are more likely to trust the third party than female contract farmers.

farmers and manipulation of quality testing by contractors. Preliminary results suggest that third-party testing and other ADR mechanisms may address the latter issue, giving farmers greater confidence in the reliability of testing provided by the buyer. Wider use of this approach may allow contract farming to expand into new areas and commodities, helping to address some of the constraints faced by small farmers in developing countries.

Gaps in the current knowledge of contract farming could be addressed by additional research. Nearly all studies of the impact of contract farming are based on cross-sectional observational studies. Multi-year (longitudinal) research would shed light on the dynamics of contract farming, while randomized control trials could provide more rigorous estimates of impact. More information is needed on the current and potential prevalence of contract farming for key commodities. Most studies focus on the farmers' views of contract farming. Research on the objectives and constraints facing contracting firms could shed further light on the conditions for successful contract farming. Much more research is needed to fully understand the role of ADR in successful contract farming, and importantly, on its impact on smallholder participation and outcomes in contract farming.

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