

Farmers' Perceptions of Contract Farming in Tanzania: A Case Study of Mtibwa Out-grower Sugar Cane Scheme in Morogoro Region

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Abstract

Globally, the role of contract farming for improving farmers' livelihoods has been a topic of interest and controversy for at least the past four decades. While some research findings recommend contract farming as a strategy to be adopted for improving farmers' livelihoods, others have expressed reservations regarding the stated benefits. They raise concerns that the "formal contract farming bandwagon" and interventions that strive to integrate rural smallholders into more formal and commercial market systems do not always deliver the benefits portrayed during promotion of new interventions. Drawing on an empirical study, this paper assesses how contract farming at Mtibwa Sugarcane Out-grower Scheme is viewed by farmers: specifically, perceptions regarding contract farming among cane growers with reference to its advantages and disadvantages are examined.

Key words: *Contract farming, Sugar cane, Out-grower scheme, Perceptions, Tanzania*

Introduction

Global economic integration and market liberalization have led to the emergence of contract farming as an important development strategy for promoting the transition of smallholders from subsistence to market oriented commercial production (Swinnen and Maertens, 2007 and Bolwig *et al.*, 2009). In sub-Saharan Africa, governments are turning to contract farming to promote improved production of various crops including cotton and sugar cane. Under contract system, a farmer agrees to supply a pre-agreed quantity and quality of produce at a pre-agreed price and time. to the processing or marketing

firm, which may provide access to technical assistance, production inputs and finance (Singh, 2005).

Globally, the role of contract farming in improving farmers' livelihoods has been a topic of interest and controversy for the past four decades (Glover, 1984 and Minot, 1986). While some research findings recommend contract farming as a strategy to be adopted for improving farmers' livelihoods, (Miyata *et al.*, 2009) others have shown reservations regarding the proposed benefits of contract farming. Opponents of contract farming raise concerns about the danger of uncritical recommendation and adoption of the institutional framework, leading to the "contract farming bandwagon," purported to integrate rural smallholders into more formal and commercial market systems (Costales and Catelo, 2009).

Advantages and Disadvantages of Contract Farming

Proponents of contract farming view this market arrangement as a means to incorporate smallholder farmers into growing markets for processed goods and export commodities. They argue that under contract farming, smallholders are able to obtain reliable and improved agricultural extension services, credit, agricultural inputs, and gain access to reliable markets for their produce (Grosh, 1994; Minot, 2007). It has also been argued that contract farming can facilitate introduction of appropriate technology and transfer of business management skills in the form of record keeping, efficient use of farm resources and knowledge of the product quality - (Songsak and Wiboonpoongse, 2008).

However, critics argue that contract farming favours resource endowed farmers and marginalizes resource poor farmers, thereby exacerbating rural inequality (Simmons *et al.*, 2005; Singh, 2002). In addition, it has been argued that contract farming rarely encourages farmers to begin any value added activity like packaging and processing or marketing their own produce (De Schutter, 2011), and can lead to reduced food production if contracted cash crops displace food crops. However, Glover (1984) maintains that this does not usually occur if farmers are allowed to make their own decisions. Other reported disadvantage of contract farming include farmers' indebtedness and overreliance on advances, domination by monopolies, manipulation of quotas and quality specifications, unsuitable technology and crop incompatibility, and increased risk (Silva, 2005).

Furthermore, a concern over power relations between smallholders vis-à-vis contractors has been documented in the literature (Source). It is argued

that smallholders under contract farming face unequal relations, leaving them vulnerable in case the contractor changes or uses loose loopholes in the contract. Their bargaining power depends on the availability of alternative sources of livelihood which may provide a safety net against monopsony power of firms (Glover, 1990; Grosh, 1994 and Little, 1994). For these reasons, Reardon and Barrett (2000) maintain that contract farming displaces the decision-making authority from the farmers to the downstream processor, turning farmers into quasi-employees.

Other studies have taken a more neutral position. They report that whether contract farming is beneficial or not, depends on various factors because it is not the contract *per se*, which is harmful, but how it is implemented in a given context (Asano- Tamanoi, 1988). Diversity in the type of firms, farmers, nature of contracts, crops and socio-economic environment play an important role in determining the effectiveness of the contract farming system. Moreover, how farmers perceive contract farming and how they define their relationship with companies differs across cultures, markets and production systems (Asano- Tamanoi, 1988). In practice, it is logical to argue that contract farming works if its advantages outweigh the disadvantages for both agribusiness firms and farmers.

Models and Typologies of Contract Farming

Contract farming can further be understood by highlighting the models and typologies presented and discussed by various authors. Available literature shows five different models of contract farming. They include the: centralized model, nucleus-estate model, multipartite model, informal model and the intermediary model (Glover and Kusterer, 1990; Eaton and Shepherd, 2001; Da Siva, 2005; Bijman, 2008 and Mansur *et al.*, 2009). The centralized model involves a centralized processor and/or packer buying from a large number of small farmers. Farmers' quotas are distributed at the beginning of each growing season and quality is tightly controlled. The centralized model is most referred for crops that are subjected to stringent processing standards. Such crops require a high-level of experience from farmers and often entail frequent changes in farm technology, and involve significant long-term investment (Eaton and Shepherd, 2001).

Meanwhile, the nucleus-estate model involves the firm owning and managing estate plantation but also involves some contracted farmers (Glover and Kusterer, 1990). Eaton and Shepherd (2001) point out that this type of model utilizes out growers from the central state. While the

contracts in the preceding types are bilateral (between the contractor and each farmer), the multipartite model involves more than two parties in the contract. This type of contract may develop from the centralized or nucleus estate models by organizing farmers into cooperatives or the contract may involve a financial institution as a party to the contract (Eaton and Shepherd, 2001).

The fourth type is referred to as the informal model because it is characterized by individual entrepreneurs or small companies who are engaged in informal production contracts, usually on a seasonal basis. This type of contract often requires government support services such as research and extension. Due to its non-formal nature, it often suffers from extra contractual side-marketing (Eaton and Shepherd, 2001). The fifth (Intermediary model), involves the processor in subcontracting linkages with farmers or intermediaries. Some drawbacks to this model are that the processor may lose control of production and quality as well as prices received by farmers (Eaton and Shepherd, 2001) since they link with farmers indirectly through the contractor.

Three main types of contracts have been adopted by producers in order ensure that processors remain in control for effective supply chain management (Bijman 2008; Glover 1984; Prowse, 2012). The first is the market specification contract where there is a pre-harvest agreement between producers and contractors on the condition governing sale of the crop. The contract usually specifies the time, sale location and the quality standards of the commodity to be supplied by farmers. Under this type of contract, the farmer maintains most of the decision rights over their farming activities and bears most of the risk for production activities. The second type of contract involves a production management contract, where the contractor has more control of the production processes compared to the market specification contracts. Under this contract the producer agrees to follow the production methods precisely and adhere to the prescribed type and amount of required inputs. The third type of contract is the resource provision contract, whereby, the contractor agrees to provide key inputs but also can act as a market outlet for the commodity produced. The costs of inputs are recovered upon product delivery.

The model of contract farming that is found at Mtibwa can be categorized as a nucleus-estate model. Mtibwa Sugar Estate Limited (MSEL) own and manage sugarcane plantations but also involve some out-growers who are contracted through their organizations to supply cane. With regard to the type of contract, market specification is the one practiced at Mtibwa. The

contract (agreement) is entered before harvesting where issues of price of cane and quotas to be supplied are agreed upon. Furthermore, the contract specifies the quality of cane to be delivered by farmers and failure to adhere to the quality may result into the rejection of cane. Farmers bears all the risks related to farm operations and management; the cane belongs to MSEL only when it has entered the weigh-bridge.

Methodology

Study area, population, sampling and sample size

This study employed a multi-staged sampling procedure to select contract farmers for sugarcane production around Mtibwa Sugar factory. The first level of sampling involved selecting two wards among five in Turiani division where the factory is located. Although sugarcane farms that are owned or managed by smallholder out grower farmers exist in all five wards of Turiani division, the majority of smallholder farmers who grow sugarcane live in Diongoya and Mtibwa wards. These two wards were therefore purposively selected for the study. Two villages were then randomly selected from each ward. The list of villages is Manyinga and Lusanga from Diongoya ward and Kidudwe and Lukenge from Mtibwa.

The sampling frame for the study comprised of all sugarcane growers who are in contract with the factory. From each village the list of growers was established with the help of the area agricultural extension agent and leaders of the Outgrowers' Organization. In each village, 15 fully integrated farmers were selected making a total of 60 fully integrated farmers. Since there were some farmers who were partially integrated into contracts, purposive and snowball sampling methods were used to identify 30 partially integrated farmers. Some of the partially integrated farmers who were interviewed for this study fall outside the randomly selected villages.

Data Collection and Analysis

Primary data were gathered through personal interviews with household heads using a structured questionnaire, and discussion with key informant using a list of guiding questions. Additional information about the local area or context of farming was obtained through interviews with five key informants, sometimes by phone, to seek clarification. The reliability of the interview schedule was improved by using four different procedures including; an initial review of the study area, calculation of Chronbach's alpha to check the internal consistency of estimates for reliability of the Likert type items, the instruments were then pretested and improved by removing questions that were not relevant and adding questions as required.

Data was collected using research assistant who were trained how to use the instrument before field data collection. Prior to data collection an exploratory visit was made to the study area to get a general understanding of the local context and learn how contract farming is organized. This step helped to reconceptualise the study.

Whereas initially, it was planned to interview contract and non-contract farmers, the visit revealed that all farmers were contracted through their organizations. The main difference was the level of their engagement in the contract. Hence, the terms contract and non-contract farmers were abandoned and replaced with the terms: fully integrated (those who get all services offered under contract i.e cane cutting, loading, transportation and marketing) and partially integrated (those who sell their cane to MSEI but do not receive other services). Examination of the study area therefore allowed modifications that helped to improve the instruments by substituting questions that were relevant to the context of the study area.

Likert type items were used to gauge the perceptions of respondents and had a Chronbach's alpha of 0.70 which according to Peterson (1994) is acceptable. Multiple-items to measure psychological attributes are more desirable because individual items have considerable random measurement error. As such, measurement error averages out when individual scores are summed to obtain a total score (Mclver and Carmines, 1981; Spector, 1992 and Nunnally and Bernstein, 1994).

The checklist of questions for key informants was also pretested and corrected. From Mtibwa Sugar Company key informants who were contacted included: the Human resource manager and Operations manager and the area coordinator of the European Union Sugar Project. Others key informants from outside the company included: the Ward Executive Officers from the two wards and the ward extension agent for Diongoya ward. Other key informants were: the leader of the out-grower organizations (MOA and TUCOCPRCOS LTD) and the chairman of Turiani Savings and Credit Cooperative Society (TuriSACCOS). Data collection began in February 2013 ending in March of the same year. Qualitative data were analysed using content analysis while quantitative data were analyzed with the help of SPSS.

Measurement of Perception

Likert type items were used to measure respondents' perceptions regarding contract farming. Favourable (positive) perceptions were measured using a set of questions that assessed the advantages obtained from services provided or by joining contract farming. The positive perceptions were then combined into an index. The stated advantages of contract farming include access to extension, new technologies, credit, reliable market, production inputs (notably, fertilizer and seeds), rehabilitation of local infrastructure (rural roads), and transportation and timely delivery of cane to the mill. Unfavourable (negative) perceptions were measured using an index of anticipated disadvantages or risks that may occur by joining contract farming. The disadvantages include, loss of freedom pertaining to farm management decisions, food insecurity, indebtedness, and rejection of sugarcane due to not meeting required standards. The perceptions of respondents under the two groups were compared using individual items and the index score (combined items). As already noted in the previous section the reliability of the instrument was ensured by calculation of Chronbach's alpha.

Results and Discussion

Socio-economic Characteristics

Sex and level of education

As indicated in Table 1, women and men respectively constituted 51.1% and 48.9% of the respondents (Table 1). In sub-Saharan Africa, women's roles in agricultural production as key providers of labour, but also taking part in making managerial roles at varying degrees as well as critical reproductive roles, have been well documented (Bryson, 1981) and this is also true with cane production. Depending on the household, the role of women in contract farming runs the gamut from contributing to production and labour, to making decisions, to being the registrant in farm organizations particularly for households that had two or more registered members.

With regard to the level of education, a majority of respondents (71.1%) attended only primary school but only 20% had any post primary education while nearly 9% had no formal education. The remainder had either secondary or technical education.

Table 1: Sex and level of education

Variable	N	Percent
Sex		
Male	44	48.9
Female	46	51.1
Education		
None	8	8.9
Primary	64	71.1
Secondary (F1 -- F4)	11	12.2
Technical/College	6	6.7
University	1	1.1

Source: Survey 2013

Education level of partially and fully integrated farmers

Cross tabulation between educational attainment and level of farmer integration revealed that partially integrated farmers had higher educational levels than fully integrated farmers. As indicated in Table 2, only 5% of fully integrated farmers had education beyond primary education compared with about 50% of partially integrated farmers who had education beyond primary level. The difference in the level of education between the two groups of farmers was significant at $p < 0.01$. The higher level of education of partially integrated farmers can be associated with higher income compared to fully integrated farmers.

Table 2: Cross tabulation of level of education

Highest level of education	Partially integrated (%)	Fully integrated (%)	Total
None	2 (6.7)	6 (10)	8
Primary	13 (43)	51 (85)	64
Ordinary (F1 -- F4)	10 (33.3)	1 (1.7)	11
Technical/College	4 (13.3)	2 (3.3)	6
University	1 (3.3)	0 (0)	1
Total	30 (100)	60 (100)	90

Pearson Chi-square = 26.54, $p = 0.000$

Source: Survey 2013

Land Holding

The amount of land owned and/or operated and the amount rented (in acres) by each respondent was collected in acres. The mean acreage of land operated by partially integrated farmers was 28.7 acres compare to 7.43 acres for fully integrated respondents (Table 3) clearly indicating that, partially integrated farmers owned more land compared to fully integrated farmers. The mean acreage owned by partially integrated farmers was 26.87

acres while fully integrated farmers had mean acreage of only 4.80 acres. These differences between land operated and land owned were statistically significant at $p < 0.01$. Also, a significant difference was observed for land rented. The mean acreage for land rented for partially integrated farmers was 1.8 and 0.3 fully integrated farmers.

Table 3: Land holding (in acres)

Land information	Mean (St. Dev.)		T-test	p-value
	Partial integrated	Full integrated		
Land operated	28.70 (17.31)	7.43 (13.91)	6.291	.000*
Land owned	26.87 (15.45)	4.80 (4.61)	10.243	.000*
Land rented	1.83 (5.94)	.33 (1.41)	1.863	.0441**

*T-test significant level at .01; ** significant at 0.1.

Perceived Advantages and Disadvantages of Contract Farming

The impact of contract farming was divided into two groups; positive and negative impact. This kind of grouping led to the formulation of two research hypotheses. It was expected that fully integrated farmers may perceive contract farming to be more advantageous compared to partially integrated farmers because they received a full package of services offered under contract (cane cutting, loading, transportation and marketing). It was also, expected that partially integrated farmers may perceive and experience more disadvantages of the contract system than fully integrated farmers because did not receive full package of services offered under contact.

Respondents' perception regarding the advantages of contract farming is presented in Table 4. The results show that both partially and fully integrated farmers had positive perceptions of three services availed under contract farming, including; extension services, adoption of new technologies and reliable market. Most of the respondents (75%) perceived that contract farming improved accessibility to extension services for which the mean score was 3.30 for partially integrated and 3.13 for fully integrated farmers. Majority of the respondents (52%) also perceived that contract farming helped them to adopt new technologies in sugarcane production (the mean score being 3.63 for partially integrated and 3.13 for fully integrated farmers). Furthermore, 72% of the respondents also perceived that contract farming enabled them to gain access to reliable markets for their sugarcane (the mean for partially integrated was 3.60 and that of fully integrated was 3.10). While differences in the mean scores existed between fully and partially integrated farmers, however, the

differences between the two groups of farmers on these three items were not statistically significant.

As indicated in Table 4, the two groups of farmers had different perceptions on all the remaining factors that influenced perceptions towards contract farming including; accessibility to credit, availability of production inputs, improvement of local infrastructure, and reduction of transportation cost and timely delivery of cane to the mill. Partially integrated farmers had favourable perceptions on contract farming while fully integrated farmers had unfavourable perceptions on the five remaining items. The differences in the mean scores were statistically significant at $p < .01$ except for availability of inputs. The difference in perceptions is probably because partially integrated farmers get more revenue by avoiding the service charge of cane cutting, loading and transportation.

Table 4: Respondents Perceptions regarding contract farming

Advantage of contract farming	Mean (St. Dev.)		T-test	p-value
	Partially integrated	Fully integrated		
With contract farming accessibility of advice from extension agent is easy	3.30 (1.32)	3.13 (1.20)	0.601	.754
Contract farming has enabled me to adopt new technologies of sugarcane production	3.63 (1.38)	3.13(1.20)	1.773	.080
Contract farming has enabled me to get reliable market of sugarcane	3.60(1.16)	3.10 (1.32)	1.757	.007
If you grow sugarcane under contract it is easy to get credit	3.43 (1.17)	2.58 (1.22)	3.153	.004**
With contract farming, sugarcane production inputs are readily available	3.60 (1.50)	2.68(1.30)	0.692	.491
Contract farming has improved local infrastructure like rural roads	3.93(1.17)	2.47(1.43)	5.186	.000*
Contract farming arrangement has lowered transport costs of our sugarcane	3.67 (1.27)	1.97(1.13)	6.441	.000*
Contract farming has improved timeliness in delivery of sugarcane to the mill	4.17 (.87)	1.80(1.07)	10.479	.000*
Composite/index score	3.53(0.53)	2.61 (0.53)	7.71	.000*

Source: Survey 2013

T-test * Significant at .01 level. ** Significant at .05

Analysis of indexed Likert Scale items shows that partially integrated farmers had positive perceptions of contract farming with the mean score of 3.53 and a standard deviation of 0.53 compared to the mean score of 2.6 for fully integrated respondents with the same standard deviation (0.53), and the difference in the mean scores was statistically different from zero. These findings imply that fully integrated farmers had negative perception towards contract farming. The results support the findings of Manorom *et al.* (2011) who conducted a study in Lao People's Democratic Republic, which established that the least satisfied farmers in terms of their reported profits were those with stronger structured agreements while the most satisfied farmers were those who have had no contracts.

The negative perceptions of fully integrated farmers toward contract farming at Mtibwa, may be associated with the fact that they face more challenges along the sugar commodity chain compared to partially integrated farmers. For example, discussion with key informants revealed that fully integrated farmers were more affected by lack of transparency because in determining sucrose content it is not possible to attribute the amount of sucrose to a specific farmer. This is attributed to sugarcane gathered into piles at the cane yard, containing sugarcane from different farms owned by different farmers. After the cane has been crushed, the sucrose content is assigned randomly to farmers. This problem affects fully integrated farmers more because of their smaller farms; a single round of crushing might contain sugarcane from more than 10 farmers, thus attributing the sucrose to a specific farmer is very difficult.

Perceived Disadvantages of Contract Farming by Individual Farmers

The perceived disadvantages of contract farming were measured using individual farmers' perceptions based on four areas which include; decisions on farm management, impact on food security, effect on the level of debt and the need for meeting required standards. The results showed that both partially and fully integrated farmers were not restricted regarding farm management decisions. The mean score for partially integrated farmers was 1.73 with a standard deviation of 0.785 compared to the score of 1.63 for fully integrated farmers with the standard deviation of 1.073. These results are consistent with explanations given by the key informants and observations made during field visits.

Most Key informants stated that the MSEL Company does not interfere with their farm management decisions: this is a feature of market specification contract under which sugarcane contract farming at Mtibwa fall. Also based on interviews with some farmers in their fields, it was evident that farmers were allowed to intercrop cane with maize, another clear example of the contract agreement not interfering into farmers' decision making. Regarding the impact of contract farming on food security, the results showed that both partially and fully integrated farmers agreed that contract farming has impacted negatively on household food security. The mean for partially integrated farmers was 3.20 and that of fully integrated farmers was 3.37. However, the differences in perceptions between the two groups of farmers were not significant.

Partially and fully integrated farmers perceived that contract farming had increased their indebtedness. The mean perception for partially integrated farmers on a five unit scale was 3.93 while that for fully integrated farmers was 3.77. However, the difference in the mean scores for this variable were not significant. The Key informants explained this by arguing that indebtedness is not caused by the contract *per se* but to a greater extent it is due to failure to harvest the cane which in turn leads to failure to repay the advance payment from various money lenders. Failure to harvest is influenced by many factors including drought, livestock keepers grazing on sugarcane fields and failure to adhere to recommended agronomic practices like weeding and fertilizer application, which is partially associated with financial constraint due to delayed payments. Most of the factors listed above affected the two strata of farmers almost equally

Sometimes the processor (MSEL) rejected sugarcane from farmers on account of not meeting the required standards. The two groups of growers differed in their perceptions regarding this variable. The partially integrated farmers generally did not agree with the statement that their sugarcane was rejected due to low quality while the fully integrated farmers agreed that in some seasons their harvested sugarcane is rejected because it did not meet the required standard. However, the differences in means between the two groups were not statistically significant.

Table 5: Perception of partially and fully integrated farmers of disadvantages of contract farming

Disadvantage of contract farming	Mean (St. Dev.)		T-test	p-value
	Partially integrated	Fully integrated		
Contract farming denies one freedom on farm management decisions	1.73 (.79)	1.63 (1.07)	.453	.652
Contract farming has negatively impacted my food security	3.20 (.96)	3.37 (1.22)	.707	.515
One gets indebted because of sugarcane production problems	3.93 (.52)	3.77 (1.20)	.918	.469
In some harvesting seasons my sugarcane has been rejected by not meeting required standards	2.93 (1.41)	3.27 (1.43)	1.049	.297
Composite/index score	2.95 (.502)	3.01 (.712)	.450	.484

Source: Survey 2013

After assessing the perception of partially and fully integrated farmers regarding the disadvantages of contract farming, the four items were combined into an indexed score as reported in Table 6, the results showed that fully integrated farmers perceived more disadvantages compared to the partially integrated farmers. However, the differences in perceptions between the two groups were not statistically significant. The mean for the partially integrated farmers was 2.95 with a standard deviation of 0.502 compared to 3.01 and the standard deviation of .712 for fully integrated farmers.

Table 6: Index score of perceptions of the disadvantages of contract farming

Mean (St. Dev.)		
Partially integrated	Fully integrated	T-test
2.95 (0.502)	3.01 (0.712)	0.45

Source: Survey 2013

Conclusion and Recommendations

This research aimed at gauging the perceptions of partially and fully integrated farmers regarding the advantages and disadvantages of contract farming. In the first hypothesis, fully integrated farmers were expected to perceive contract farming as having more advantages compared to partially integrated farmers because the latter receive a full package of services offered under the contract. Meanwhile, partially integrated farmers receive

only marketing service. The findings show that both partially and fully integrated farmers had positive perceptions towards contract farming pointing out providing access to extension, new technologies, and reliable markets.

Regarding the second hypothesis, it was expected that partially integrated farmers would perceive more disadvantages of the contract system than fully integrated farmers since they did not receive a full package of services offered under the contract. The results show that fully integrated farmers perceived more disadvantages compared to the partially integrated farmers. However, the differences in perceptions between the two categories of farmers were not statistically significant.

It is therefore concluded that contract farming works for all categories of farmers and can be a viable means of solving marketing and input challenges that farmers face. However, for farmers to realize more benefits MSEL should pay attention to specific problems with organizational services that influence the negative perceptions that fully integrated farmers have on contract farming. Disagreements over quality of cane, for example, can be avoided by providing clear, simple specifications in a contract and by ensuring that farmers or their representatives are present when the produce is graded. The MSEL also should strive to pay farmers on time because late payment cause a breakdown of trust and therefore must be avoided. It is further recommend that MSEL should establish a community trust fund that can attract more resources from outside the community. The funds can be used to improve social services such as health, education, water and electricity.

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