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Contract Farming, Smallholders and Commercialization of Agriculture in Uganda: The Case of Sorghum, Sunflower, and Rice Contract Farming Schemes.

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ABSTRACT: Contract farming has expanded in Uganda due to the promotional efforts of various actors: private, public, and/or international aid agencies. While motives for promoting contract farming may vary by actor, it is argued in this study that contract farming is crucial in the commercialization of smallholder agriculture and hence, poverty reduction in Uganda. However, smallholder farmers in Uganda have reportedly experienced some contractual problems when dealing with large agribusiness firms, resulting in them giving up contract farming. Similarly, agribusinesses have also reportedly encountered some contractual problems when dealing with some smallholder farmers that could have led to the exclusion of the latter from contract farming. Therefore, the main objective of this study was to examine the role of contract farming in the commercialization of smallholder agriculture in Uganda by using sunflower, sorghum, and rice contract schemes as case studies. Specifically, the study sought to characterize the sorghum, sunflower, and rice contract schemes as well as identify benefits and problems associated with them. Primary data were collected by a combined use of survey and informal interview methods. A survey of both contracted and non contracted farmers was conducted in Soroti District (Sorghum), Apac District (Sunflower), and Bugiri District (Rice). Informal interviews were held with agribusiness firms (Nile Breweries Limited, Mukwano Industries, and Tilda (U) Limited), their agents, and support organizations. Data were then analyzed using descriptive statistics and non parametric tests (Chi-square and F-tests). While most of the findings from this study are general in nature, some of them are idiosyncratic to the case studies investigated. It was generally found contract farming contributed a great deal to the commercialization of smallholder agriculture in Uganda, especially in the sorghum (*Epuripur*) and sunflower sub-sectors. While agribusinesses obtained assured supply of raw materials for their processing needs, smallholder farmers on the other hand had access to critical inputs such as improved seeds and extension services, in addition to access to a guaranteed market for their produce. However, there were still some challenges in the organization and operation of the contract farming schemes. Thus, both agribusinesses and policy makers have separate roles to play in making sure contract farming is properly nurtured for the benefit of smallholder farmers in Uganda.

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Introduction

Contract farming has successfully enabled smallholder farmers in developing countries to commercialize their farming operations through the creation of market linkages, both domestic and international. Numerous case studies involving various agricultural commodities (e.g. tea, sugarcane, cotton, oil palm, oilseeds and rice) done in several developing countries in Africa, Asia, Central and Latin America have shown that smallholder farmers have variably benefited from contract farming through the access of production inputs, output markets, market development, rural development, and other intangible benefits (Masakure and Henson, 2005; Eaton and Shepherd, 2001; Key and Runsten, 1999; Porter and Howard, 1997; and Glover, 1987).

In Uganda, contract farming has been traditionally restricted to plantation crops (sugarcane and tea) where out-growers have been supplementing production of large processing agribusiness firms such as Kakira Sugar Works, Sugar Corporation of Uganda Limited, Kinyara Sugar Works, and Kasaku Tea Estate. However, other agribusiness firms such as British American Tobacco, Nile Breweries, Uganda Breweries, Outspan Enterprises Limited, Mukwano Industries, Bee Natural Products, Ugachick, and some co-operative unions have also extended contracts to smallholder farmers to ensure a continuous supply of critical inputs. Hence, the use of contract farming has spread to other agricultural commodities, namely: cotton, tobacco, sunflower, maize (quality protein maize), sorghum (*Epuripur*), organic products (cotton, coffee, sesame etc.), oilseeds, rice, honey, and poultry. Some of these contract farming schemes have been credited for playing a key role in increasing the profitability of crop farming, reducing marketing risks,

and above all opening up new markets for non traditional cash crops both at domestic and international levels (Wiegratz et al., 2007; Nalukenge, 2005a&b; Sejjaaka, 2004; Tulip and Ton, 2002; and International Union of Food).

Given the benefits accruing to smallholder farmers from engaging in contract farming, it can be argued that it is crucial in the commercialization of agriculture and hence, poverty reduction in Uganda. This further suggests that by encouraging and supporting contract farming, it can assist the government to realize its vision of eradicating poverty in Uganda as stipulated in the Poverty Eradication Action Plan (PEAP) formed in 1997.

However, while contract farming offers a huge opportunity for commercializing smallholder agriculture, smallholder farmers have reportedly experienced some contractual problems in dealing with large agribusiness firms, resulting in smallholder farmers giving up contract farming. Similarly, agribusinesses have also reportedly encountered some contractual problems when dealing with some smallholder farmers that could have led to the exclusion of the latter from contract farming. In general, these contractual problems have been largely attributed to the failure of one of the parties to the contract, either agribusiness firm or smallholder farmer, to honor agreed-upon contracts (Wiegratz et al., 2007; Nalukenge, 2005a&b; and The New Vision 2003a&b).

It can be argued that the above contractual problems might have been aggravated by the existence of inadequate contractual laws or the weak enforcement of contractual laws prevailing

in Uganda. Hence, there is need to enact, implement, and enforce favorable contractual laws and policies to support both smallholder farmers and agribusiness firms in their contractual production and marketing arrangements. Additionally, there is also need to identify suitable trade policies that have the potential to increase the participation of smallholder farmers in contract farming if agricultural commercialization and thence, poverty reduction is to be achieved in Uganda.

Therefore, the main objective of this study was to examine the role of contract farming in the commercialization of smallholder agriculture in Uganda by using sunflower, sorghum, and rice contract schemes as case studies. In this study, smallholder farmers are defined as peasant farmers who practice mostly subsistence agriculture. Findings from this study will assist policy makers to formulate appropriate trade policies related to contract farming that are critically important in the advancement of commercial agriculture in Uganda.

Literature review

Contract farming can be defined as an “agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices” (Eaton and Shepherd, 2001). The decision for agribusinesses and farmers to adopt contract farming can be explained by the use of transaction cost and risk theories. Transaction cost theory posits that organizations assume structures partly to minimize transaction costs that are usually high under conditions of high asset specificity,

uncertainty, and information involvement, or in a non-competitive market structure (Williamson, 1985). Following the risk theory, contract farming can be used by both the principal (agribusiness) and agent (farmer) to mitigate risks (Mas-Colell et al., 1995).

The emergence and expansion of contract farming throughout the world is well documented in various studies (Baumann, 2000; and Runsten and Key, 1996). From these studies, it is known that contract farming is an old practice, which started in the 19th Century in developed countries. For example, perishable crops destined for processing, such as sugar beets or peaches, were grown under contract in the 19th Century in the United States. In the 1940s, the use of contract farming spread to Latin America as multinational food processors, especially strawberry freezers and fruit and vegetable canners, set up their operations there. Afterwards, the use of contract farming expanded to other developing countries in Asia and Africa.

Several factors have been attributed to the emergence of contract farming and these factors seem to vary between developed and developing countries. In developed countries, agribusinesses were economically motivated and entered into contracts with farmers in order to obtain assured supply of produce for processing (Runsten and Key, 1996). This could have been the case for multinational food processors that moved into Latin America in the 1940s although Baumann (2000) argues that contract farming emergence in developing countries was sparked off by other motives.

Baumann forwards two factors that led to the emergence of contract farming in developing

countries. First, after independence, foreign agribusinesses owning plantations are said to have adopted contract farming because they faced “nationalist pressures, threats of expropriation and new conditions of profitability.” Runsten and Key (1996) also concur with this point as they observed that some agribusiness firms that were involved in plantation agriculture in Latin America, such as the banana producers, took on contracting as a “means of defusing nationalistic criticism of their operations.” Second, some out-grower schemes that have emerged in developing countries have been sponsored by their respective states/governments, private companies, and/or international aid or lending agencies, such as International Monetary Fund and the World Bank, in order to “revive flagging export markets.” This category of out-grower schemes is said to include most of the out-grower schemes that have recently surfaced in developing countries across Asia, Latin America and Africa, namely: palm oil, cocoa and rubber contract schemes.

Thus, various typologies of contract farming schemes exist. Baumann (2000) classify contract farming into three types: out-grower schemes, nucleus estate – out-grower schemes, and multipartite arrangements. Eaton and Shepherd (2001) provide a much richer categorization of contract farming schemes based on the product, the resources of the sponsor, and the intensity of the relationship between the farmer and sponsor. They identify five types or models of contract farming, namely: centralized, nucleus estate, multipartite, informal, and intermediary models. Nonetheless, the typologies provided by the above authors are quite similar except for the informal and intermediary models that are unique to Eaton and Shepherd.

Across many developing countries, contract farming has been found to play an important role in the commercialization of smallholder agriculture through the provision of an assured market, high prices, critical inputs, knowledge on new agricultural technologies to farmers, and as a driver of rural development strategy (Masakure and Henson, 2005; Eaton and Shepherd, 2001; Glover, online; Key and Runsten, 1999; Porter and Howard, 1997; Runsten and Key, 1996; Glover, 1989; and FAO).

However, contract farming has been also criticized, as being ‘exploitative’ to smallholder farmers (Baumann, 2000 and Runsten and Key, 1996). As far back as the 19th Century, Runsten and Key (1996) reveal that there were “problems of monopsony or oligopsony” with food processors and marketers in the United States at the detriment of contract farmers who lacked bargaining power. Runsten and Key list some of the efforts that were made by the US government to “organize farmers to provide a united bargaining front.” Moreover, the contracts issued by agribusinesses have been found to be lacking for they have been either informal or suit best agribusinesses (Baumann, 2000). In developing countries, there has also been a similar view, in certain circles, about contracting agribusinesses that they are monopsonies/oligopsonies and, that smallholder farmers need to be organized to boost their bargaining power (Coulter et al., 1999; and Mugerwa, 2005).

As Runsten and Key (1996) rightly put it, the reality about contract farming is that it “lies somewhere in between” the positive and negative stories behind it. This is because the success of contract farming projects in developing countries has been staggering, with some of them

succeeding and others failing. And, if we are to go by Runsten and Key's words, then it should be noted that "there are crops and situations appropriate to smallholder participation, and that there are crops and situations that are almost certainly doomed to fail."

Therefore, this study attempted to systematically investigate sorghum, sunflower, and rice contract farming schemes in Uganda with a view to characterize them, determine their associated benefits and problems, and to provide the appropriate recommendations to agribusinesses and policy makers.

Methodology

This study was conducted in the following areas because of the availability of the selected contract schemes: Soroti District (Sorghum), Apac District (Sunflower), and Bugiri District (Rice). For all the selected contract farming schemes, a comprehensive list of contracted farmers could not be obtained. In the sorghum contract farming scheme, this problem was further complicated by the fact that many farmers did not know whether they were involved in contract farming or not. However, by using the source of sorghum seeds farmers planted as a criteria for categorizing them, 130 contracted and 116 non contracted farmers were randomly selected for the study, making a total sample of 246 sorghum farmers. For the sunflower contract farming scheme, a total sample of 197 (143 contracted and 54 non contracted sunflower farmers) were randomly selected for the study with the help of employees from Appropriate Technology (Uganda) Limited. However, for the rice contract farming scheme, it was possible to identify and

select both contracted and non contracted farmers. Therefore, 72 contracted and 170 non contracted farmers were selected for the study. This made a total sample of 242 rice farmers.

Data was collected from May to July, 2007. Primary data were collected from farmers about their demographics, crop production and marketing using the survey method. Informal interviews were held with employees of contracting agribusiness firms and their agents and support organizations to obtain supplementary information such as origin, organization, nature, problems, and sustainability of the contract farming schemes. Contracting agribusinesses included: Nile Breweries Limited (NBL) for sorghum, Mukwano Industries Limited for sunflower, and Tilda (U) Limited for rice. Some of the support organizations contacted were: National Agricultural Advisory Services (NAADS), National Agricultural Research Organization (NARO), and international aid agencies.

Data was then analysed using descriptive statistics and non parametric tests (chi-square and F-tests) were conducted to test for any significant differences between contract and non contract farmers for each contract farming scheme. The Statistical Package for Social Scientists (SPSS) software was used in data analysis. In order to determine the profitability of farmers associated with the selected contract farming schemes, the gross margin analytical method was used (Castle et al., 1987).

Results

Characteristics of Contracted and Non Contracted Farmers

Across the studied contract farming schemes, there were no significant differences in

characteristics (except for membership in farmers' organization) between contracted and non contracted farmers as shown by the non parametric tests conducted (Table 1). Generally, it was mostly lowly educated male farmers with 1.1 – 2.7 acres who were involved in contract farming schemes. Contracted sunflower and rice farmers tended to belong to some farmers' organization than their counterparts and yet such a distinction was not present in the sorghum contract farming scheme. It can thus be concluded that it was smallholder farmers who were participating in sorghum, sunflower, and rice contract farming schemes. The low involvement of female farmers in these schemes could be related to the widespread nature of male-headed households or male dominance in cash crop production. The high involvement of sunflower and rice farmers in farmers' organization might improve their bargaining positions against the respective contracting agribusinesses as noted by Coulter et al. (1999) and Mugerwa (2005).

[INSERT TABLE 1]

Origin and Organization of the Contract Farming Schemes

As argued by Runsten and Key (1996), the origin of the sorghum, sunflower, and rice contract farming schemes was motivated by purely profit rather than philanthropy. The sorghum contract scheme followed a multipartite model involving NBL, Government of Uganda, NAADS, NARO and about 8,000 farmers located in nearly 20 districts. This contract farming scheme was started by Nile Breweries Limited (NBL), a subsidiary of South African Breweries (SAB) Miller in 2002. The purpose of starting the sorghum contract farming scheme was to obtain sorghum (*Epuripur*) locally for making affordable non malt beer for the Uganda market. With an annual

demand of 6,000 metric tons, NBL saw that sourcing sorghum locally attracted excise deductions from the Government of Uganda and, this in turn would result into substantial cost reductions that would be passed on to the consumer in the form of a lower price.

Similarly, the sunflower contract farming scheme also followed a multipartite model in which Mukwano Industries Limited, government organizations (NAADS and NARO), international aid agencies, and about 32,000 smallholder farmers located in four districts, namely: Lira, Apac, Oyam, and Masindi. Mukwano Industries Limited (A.K. Oils and Fats Limited division) began the sunflower contract farming scheme in 2003 with the main objective of obtaining assured supply of sunflower for the production of edible oil through the introduction of a high yielding sunflower variety known as PAN 7351. Before the scheme, Mukwano Industries used to procure sunflower from the spot market. But, with the entry of new players into the edible oil processing, the competition for the sunflower seed increased. To meet its oil mill annual capacity, Mukwano required 100,000 metric tones of sunflower seed, of which only 30% (i.e. 30,000 metric tones) was supplied by contracted farmers. However, Mukwano was setting up two additional cooking oil processing factories, one in Lira and the other in Dar es Salaam, Tanzania. With these local and regional expansion programmes its demand for sunflower seed for processing was expected to increase. Perhaps, this explains why Mukwano Industries was targeting to raise the number of contracted farmers to about 150,000 by 2008.

In contrast, the rice contract farming scheme followed a centralized model as Tilda (Uganda) Limited supplemented its own production with output from out-growers to satisfy its enormous

milling needs. In 2004, Tilda began the rice contract scheme to increase its own production to meet the rising and huge market demand for rice, both domestically and internationally. Tilda had 650 hectares of arable land suitable for rice production and it was capable of producing up to approximately 4,000 metric tons of rice per year. However, Tilda had installed an ultra-modern rice milling and processing facility with a capacity to process 40,000 metric tonnes of rice per year implying that the total capacity was being underutilized. Through an out-growers' scheme, Tilda had contracted 600 farmers from the following four districts: Bugiri, Iganga, Busia, and Tororo. A few of those out-growers used Tilda's land while the rest of them relied on their own land for rice production. Together, these out-growers brought in about 3,000 metric tons of rice per year suggesting the expansion of the scheme to include more farmers.

Farmers' Awareness about of the Contract Farming Schemes

Apart from the sunflower contract farming scheme, the existence of other schemes were not known by a majority of respondents. As shown in Table 2 below, only 24% of the non contracted farmers interviewed did not know about the sunflower contract farming compared to 71% for rice and 81% for sorghum. It should quickly be noted that in the case of sorghum, only 10% of the respondents indicated they produced it on contract the previous season while the rest of them (90%) said they did not. It is no wonder that the way some of these contract schemes have been organized by agribusinesses or their agents has made only very few farmers aware of their existence.

[INSERT TABLE 2]

The contracts Mukwano Industries signed with sunflower farmers were formal or written and were seasonal. Similarly, the type of contracts Tilda entered with rice farmers were formal or written contracts and ran for two seasons or one farming year. However, when it came to the sorghum contract farming scheme, it was revealed that Nile Breweries/Afro-Kai entered into written or formal contracts with only the relevant district farmers associations and not with individual farmers. And, when there was any contractual dispute, it was further revealed from contracting agribusinesses that mutual discussions were held with the farmer through their arbitrators such as the company lawyer, personnel manager, and community leaders. These findings are consistent with those of Baumann (2000) that the contracts issued by agribusinesses are always lacking for they are either informal or suit best those agribusinesses.

Benefits of the contract farming schemes to participating farmers

Among the studied contract farming schemes, the sorghum contract farming scheme was the only one that was regarded by both contracted and non contracted farmers as being beneficial (Table 3).

[INSERT TABLE 3]

For interviewed contracted farmers, they indicated that they benefited from contract farming in the following ways: reliable/assured market, high prices, access to critical inputs, presence of extension services, and reduction in production risks (Table 4). Hence, these findings corroborate

those from earlier studies about the benefits associated with contract farming (Masakure and Henson, 2005; Eaton and Shepherd, 2001; Key and Runsten, 1999; Porter and Howard, 1997; Runsten and Key, 1996; and Glover, 1989).

[INSERT TABLE 4]

Assured or Reliable Market

Except for rice, the other contract farming schemes were commended by farmers for providing them with an assured or reliable market. In the case of sorghum, NBL/Afro-kai was the sole largest buyer with better prices although some farmers reported having sold their sorghum to traders mainly because of reduced marketing costs (Table 5). This was not the case for sunflower. Although Mukwano was the largest buyer, there were other competing oil millers, both small and medium. Some of these oil millers offered better prices compared to Mukwano since they had not invested in sunflower promotional activities, such as extension services. As for rice, the huge demand for it in the domestic market meant that non contracted farmers could sell their produce elsewhere other than Tilda at reduced marketing costs and high prices.

[INSERT TABLE 5]

Profitability of contract farming schemes

The main purpose of producing the studied crops was to obtain cash income as revealed by both interviewed contracted or non contracted farmers. When profitability of these crops was then computed, it was generally found that both sorghum and rice production was profitable for both

contracted and non contracted farmers. However, average gross profits per acre were higher for rice than sorghum, that is, Ush 76,000 versus Ush 17,126. Moreover, unlike sorghum, non contracted rice farmers made more profits than their counterparts. In the case of sunflower, the average gross profits per acre for contracted farmers were positive (i.e. Ush 20,456) while those of non contracted farmers were negative (i.e. Ush -7,775) as shown in Table 6 below:

[INSERT TABLE 6]

Higher profits obtained by contracted than non contracted sorghum farmers could be explained by lower prices received by some non contracted farmers, and low yields obtained possibly due to the latter's lack of farming experience (Table 1 above). The observed profit differential contracted and non contracted rice farmers could be related to the existing price differential since contracted farmers delivered wet (or dry) rice to Tilda for a price of Ush 250/kg (or Ush 500/kg) while non contracted farmers sold their dry rice on the spot market at a price of Ush 600 or even more. Disparity in gross profits between contracted and non contracted sunflower farmers could be related to the varietal yield difference since PAN (grown by contracted farmers) was said to outperform Sunfola (grown by non contracted farmers) in terms of yields. Since contracted farmers were generally outperforming their counterparts in profitability, these findings seem to disagree with the notion that contract farming is 'exploitative' to smallholder farmers (Baumann, 2000 and Runsten and Key, 1996).

Access to critical inputs

Three kinds of inputs are considered critical in the studied contract farming schemes: improved seeds, extension services, and credit. As shown in Table 7, the major sources of sorghum and sunflower seeds for contracted farmers were NBL/Afro-Kai (59%) and Mukwano (97%), respectively. Other major sources of seeds for contracted sorghum farmers included: NGO (25%), local market (12%), and input stockists (12%). For non contracted sorghum and sunflower farmers, they obtained seeds from a variety of sources; the former from the local market (56%), relative/friend (32%), and previous harvest (15%) and the latter from the local market (39%), previous harvest (28%), Mukwano (21%), and relative/friend (13%). On the contrary, contracted rice farmers obtained seed from input stockists (67%), previous harvest (58%), and Tilda (33%) while non contracted rice farmers got them from previous harvest (50%), input stockists (35%), local market (23%), and relative/friend (12%). Following these findings, it can be contended that it is only Mukwano which had virtually complete control over the sunflower seed distribution and quality. NBL/Afro-Kai did not have full control of sorghum seed distribution and quality and, perhaps that explains why there was overproduction of sorghum in the 2006 season. Tilda, on the other hand, seemed to be in full control of seed distribution and quality only among those outgrowers using its land and not those using their own land.

[INSERT TABLE 7]

Unlike in other contract farming schemes, a majority of sorghum farmers appeared to be lacking access to extension services and credit necessary for the uptake of modern production

technologies. Only 15% of the interviewed contracted sorghum farmers said they received extension service in the last season mainly from NBL/Afro-Kai and NAADS and, almost all (98%) of them claimed they did not get any credit to grow sorghum. In contrast, a majority (97%) of contracted rice farmers interviewed said they received extension services in the last season and especially from Tilda. In addition, a majority (85%) of the contracted rice farmers interviewed showed they accessed some form of credit meant for rice production in the last season (Table 8). This was a unique finding because contracted rice farmers belonged to Kibimba Savings and Credit Scheme (KISACS), which procured small agricultural loans for its members from the Centenary Rural Development Bank.

Although the presence of extension services was not a highly ranked benefit by contracted sunflower farmers, it was found that Mukwano tried to reach and inform them through its agents. When asked whether they received any extension service in the last season, 47% of the interviewed contracted farmers said so and, 78% of them indicated they received it from Mukwano/Agents. Even for the few non contracted farmers (17%) who indicated they received some extension service in the last season, more than one-half of them reported having got it from Mukwano/Agents suggesting some spillover effects from the scheme (Table 8). However, there was general lack of access to credit by both contracted and non contracted farmers.

[INSERT TABLE 8]

These findings basically suggest that there is need to improve farmers' access to extension

services and credit to promote rapid adoption of modern production technologies. Tilda seemed to be doing a good job along this direction and this could as well be emulated by NBL and Mukwano. For example, some sunflower farmers complained that the price of PAN seed was high and probably, the contract would attract more farmers if these seeds were supplied on credit and payments made later when they delivered their produce for sale. Likewise, public extension service delivery efforts by sub-county extension agents and NAADS need to be stepped up to supplement those of private companies and to benefit non contracted farmers who are at large.

Increase in adoption of improved seeds

Not only have the selected contract farming schemes led to the access of improved seeds but they have also led to their high adoption particularly by sorghum and sunflower farmers. The introduction of *Epuripur* sorghum and its contractual production arrangements, has led to its wide adoption by farmers. Previously, the adoption of improved sorghum technologies had been low owing to the lack of markets and other factors. Elyanu et al. (2002) found that the rate of adoption of improved sorghum varieties was only 35% of the sorghum land area and that the likelihood of their adoption was 53%. Improved sorghum varieties that have been developed but have not been widely adopted include *Serena*, *Seredo*, and *Sekedo*. Similarly, before the introduction of PAN, the dominant sunflower variety grown in Uganda was Sunfola. Although Sunfola is still being promoted by Uganda Oilseed Processors Association (UOSPA) in the same districts Mukwano is operating, PAN has been widely adopted there because of its higher yield.

Problems in crop production and marketing

Numerous problems were raised by farmers as affecting them during the production and marketing of sorghum. Most of these problems were general in nature although some of them were idiosyncratic to the selected contract farming schemes. As shown in Table 9 farmers indicated they faced six major problems during crop production, namely: high production costs, high marketing costs, birds, pests and diseases, unreliable market, and bad weather. Delayed payment of produce was highlighted by sorghum farmers, rice farmers were constrained by lack of land, while sunflower farmers complained of poor quality seed and soil exhaustion. High price of seed was mentioned by sorghum and sunflower farmers. Other problems farmers enumerated were lack of extension services and credit, use of fake weights by agents, theft of crop in garden, and non compensation for their storage bags at collection points.

[INSERT TABLE 9]

In the sorghum contract farming scheme, there was no significant difference in any of the perceived problems between contracted and non contracted farmers. Generally, besides birds, high production and marketing costs, the most serious problem sorghum farmers seemed to indicate was that fields that were once put to *Epuripur* production were prone to attack by the witch weed (*Striga sp.*), a sign of soil exhaustion. Since *Epuripur* is a high yielding variety, it absorbs and depletes much of the soil nutrients. Hence proper management of soil fertility is crucial in *Epuripur* production. Then the issue about market unreliability could have cropped up probably because of overproduction that was realized in 2006 crop season. Some farmers had to

sell their sorghum at throw away prices. At the same time some traders/agents are said to have taken advantage of the situation and offered farmers lower prices than the contract price. In fact, a few farmers complained they had not even been paid for their delivered sorghum.

Although both contract and non contract sunflower farmers complained of higher production and marketing costs, birds, high price of seed, unreliable market, adverse weather, and loss of soil fertility, they significantly differed in some of their perceived problems (poor quality seeds and pests and diseases). As to why contracted farmers seemed to have been more affected by pests and diseases than their counterparts, it might have been that the PAN variety was more susceptible to pests and diseases than Sunfola that was being grown by non contracted farmers.

The rice contract farming scheme was more exceptional in that there were significant differences between contracted and non contracted farmers in all of the problems they perceived were important except high production costs and pests and diseases. Compared to contracted farmers, non contracted farmers seemed to have been more affected by unreliable markets, high marketing costs, and bad weather but were less affected by lack of land and birds. It can be argued that contracted rice farmers were cushioned by Tilda through the provision of an assured market as well as benefited from the irrigation infrastructure. However, perhaps due to the extensive cultivation of rice in and around Tilda, there was little or no more land for expansion and attraction of very many birds that were difficult to control using primitive methods such as scare crows. The issue of land was further complicated by the fact that Tilda was on the process of phasing out contracted farmers who were using company land as the necessary irrigation

infrastructure was being installed.

Conclusion

Contract farming has contributed a great deal to the commercialization of smallholder agriculture in Uganda, especially in the sorghum (*Epuripur*) and sunflower sub-sectors. While agribusinesses have obtained assured supply of raw materials for their processing needs, smallholder farmers on the other hand have had access to critical inputs such as improved seeds and extension services, in addition to access to a guaranteed market for their produce. However, there are still some challenges in the organization and operation of the contract farming schemes. Thus, both agribusinesses and policy makers have separate roles to play to make sure contract farming is properly nurtured for the benefit of smallholder farmers in Uganda.

Marketing and policy implications

Contracting agribusinesses need to sensitize farmers about contract farming since most of them are not aware of its existence, operations, and benefits. They should consider entering into direct forward production contracts with farmers to avoid any extra-contractual problems and then assist contracted farmers to procure the necessary inputs at reasonable prices. They should discourage buying produce from non contract farmers as they will see no need or urgency to join the contract. It is also important for agribusinesses to provide extension services to farmers to improve farm productivity and quality of produce as well as educate agents about business ethics, especially on the need to be honest with farmers regarding weights and payments.

On the other hand, policy makers need to establish contractual laws that will govern forward production and marketing contracts between agribusinesses and farmers in addition to establishing and strengthening contract enforcing institutions to protect both parties to contracts (agribusinesses and farmers) from any extra-contractual problems. There is need to organize farmers into groups to increase their bargaining power since contracting agribusinesses tend to be oligopsonies or monopsonies with high market power. Moreover, farmers need to be educated about the importance of contract farming and the need to honor agreed-upon contracts. Provision of incentives to agribusinesses that are embracing and promoting contract farming is paramount. Lastly, there is need to support research and development, and extension activities related to crops being promoted by contract farming.

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Table 1: Characteristics of contracted and non contracted farmers

Characteristic	Sorghum				Sunflower				Rice			
	CFs (n = 130)	NCFs (n = 116)	Total (n = 246)	χ^2 or F-test	CFs (n = 143)	NCFs (n = 54)	Total (N = 197)	χ^2 or F-test	CFs (n = 72)	NCFs (n = 170)	Total (N=242)	χ^2 or F-test
Gender												
Male	87.7%	87.1%	87.4%	0.022	84.5%	71.7%	81.0%	4.119*	69.6%	86.8%	81.8%	9.763**
Female	12.3%	12.9%	12.6%		15.5%	28.3%	19.0%		30.4%	13.2%	18.2%	
Education												
Never	8.8%	13.3%	10.9%		3.6%	15.1%	6.7%		26.8%	17.6%	20.3%	
Primary	67.2%	71.7%	69.3%	4.944	46.4%	52.8%	48.2%	10.65*	47.9%	63.0%	56.8%	5.242
Secondary	22.4%	12.4%	17.6%		38.6%	24.5%	34.7%		22.5%	18.2%	19.5%	
Tertiary	1.6%	2.6%	2.2%		11.4%	7.5%	10.4%		2.8%	1.2%	1.7%	
Primary occupation												
Farming	95.3%	91.3%	93.4%	1.623	97.1%	94.3%	96.4%	0.864	97.2%	98.2%	97.9%	0.237
Non farming	4.7%	8.7%	6.6%		2.9%	5.7%	3.6%		2.8%	1.8%	2.1%	
Group membership												
Yes	27.8%	24.3%	26.2%	0.362	48.9%	9.4%	38.0%	25.4**	34.8%	15.7%	21.1%	10.43**
No	72.2%	75.7%	73.8%		51.5%	90.6%	62.0%		65.2%	84.3%	78.9%	
Age	37.8	37.1	37.5	0.177	34.5	34.8	34.5	0.867	34.1	34.9	34.7	0.274
Household size	8.5	8.4	8.4	0.049	6.7	6.7	6.7	0.002	7.2	8.6	8.2	2.883
Total land (Acres)	8.3	6.8	7.6	2.787	6.8	5.6	6.5	0.425	2.1	1.9	2.0	1.101
Crop land (Acres)	2.3	1.5	1.9	9.35*	2.7	2.0	2.5	1.338	1.6	1.1	1.3	1.878

Note: CFs = Contracted farmers; NCFs = Non contracted farmers; and significance levels: - ** (1%) and * (5%)

Table 2: Reasons for not being in the contract scheme

Reason	Sorghum	Sunflower	Rice
Don't know about the contract	81.4%	24.1%	71.2%
Dislike the contract	5.6%	11.1%	41.8%
Failure to enter the contract	7.9%	9.2%	9.4%
Low prices with the contract	5.6%	3.7%	12.4%
Stringent contract requirements	4.7%	27.8%	25.3%
Unreliable market	8.8%	1.9%	6.5%
TOTAL	215	54	170

Table 4: Benefits from contract farming schemes

Benefit	Sorghum	Sunflower	Rice
Reliable/assured market	45.2%	65.7%	33.3%
High output prices	35.5%	39.9%	26.4%
Access to critical inputs	32.3%	27.2%	27.8%
Presence of extension services	12.9%	4.9%	20.8%
Reduction in production risks	25.8%	3.5%	22.2%
TOTAL	31	143	72

Table 3: Farmers' perceptions of benefits of contract compared to non contract farming

Degree of perception	Sorghum			Sunflower			Rice		
	CFs (n = 130)	NCFs (n = 116)	Total (n = 246)	CFs (n = 143)	NCFs (n = 54)	Total (N=197)	CFs (n = 72)	NCFs (n = 170)	Total (N=242)
More	65.5%	66.7%	66.0%	80.2%	44.2%	71.3%	73.9%	3.7%	24.8%
Same	14.7%	11.1%	13.0%	3.8%	23.3%	8.6%	15.9%	5.6%	8.7%
Less	19.8%	22.2%	21.0%	16.0%	32.6%	20.1%	10.2%	90.7%	66.5%

Note: CFs = Contracted farmers; NCFs = Non contracted farmers; and significance levels: - ** (1%) and * (5%)

Table 5: Reasons for selling through other marketing channels

Reason	Sorghum			Sunflower			Rice		
	CFs (n = 130)	NCFs (n = 116)	Total (n = 246)	CFs (n = 143)	NCFs (n = 54)	Total (N=197)	CFs (n = 72)	NCFs (n = 170)	Total (N=242)
Reduced marketing costs	17.7%	26.7%	22.0%	0.7%	16.7%	5.1%	2.8%	72.9%	52.1%
High price	8.5%	9.5%	8.9%	2.8%	9.3%	4.6%	4.2%	82.9%	59.5%
Rejected output	0.8%	1.7%	1.2%	2.8%	18.5%	7.1%	1.4%	8.2%	6.2%
Excess output	0.8%	1.7%	1.2%	0.0%	3.7%	1.0%	2.8%	3.5%	3.3%
Other	0.0%	0.0%	0.0%	0.0%	29.6%	8.1%	0.0%	0.6%	0.4%

Note: CFs = Contracted farmers; NCFs = Non contracted farmers; and significance levels: - ** (1%) and * (5%)

Table 6: Comparative profitability of contract farming schemes

	Sorghum			Sunflower			Rice		
	CFs (n = 130)	NCFs (n = 116)	Total (n = 246)	CFs (n = 143)	NCFs (n = 54)	Total (N= 197)	CFs (n = 72)	NCFs (n = 170)	Total (N=242)
Gross Revenue (Ush/Acre)	113,867	89,475	102,365	101,969	76,613	94,744	402,000	414,000	408,000
Total Variable Costs (Ush/Acre)	85,765	84,650	85,239	81,513	84,388	82,295	334,000	330,000	332,000
Gross profit (Ush/Acre)	28,102	4,825	17,126	20,456	(7,775)	12,449	68,000	84,000	76,000

Note: CFs = Contracted farmers; NCFs = Non contracted farmers

Table 7: Sources of sorghum, sunflower, and rice seeds

Source	Sorghum			Sunflower			Rice			
	CFs (n = 130)	NCFs (n = 116)	Total (n = 246)	CFs (n = 143)	NCFs (n = 54)	Total (N= 197)	CFs (n = 72)	NCFs (n = 170)	Total (N=242)	² -
Agribusiness/agent	59.2%	0.0%	31.3%	97.2%	20.4%	76.1%	33.3%	0.0%	9.9%	62.91**
Previous harvest	1.5%	14.7%	7.7%	0.0%	27.8%	7.6%	58.3%	46.5%	50.0%	2.85
Seed company	6.2%	0.0%	3.3%	0.0%	0.0%	0.0%	1.4%	0.0%	0.4%	2.37
Input stockist	11.5%	0.0%	6.1%	1.4%	5.6%	2.5%	66.7%	21.2%	34.7%	46.18**
Local market	12.3%	56.0%	32.9%	2.8%	38.7%	12.7%	0.0%	32.9%	23.1%	30.86**
Relative/friend	3.8%	31.9%	17.1%	0.7%	13.0%	4.1%	1.4%	16.5%	12.0%	10.91**
GO	2.3%	0.0%	1.2%	0.7%	5.6%	2.0%	1.4%	0.0%	0.4%	2.37
NGO	24.6%	0.0%	13.0%	0.7%	1.9%	1.0%	0.0%	0.0%	0.0%	-
Other	0.0%	1.7%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-

Note: CFs = Contracted farmers; NCFs = Non contracted farmers; and significance levels: - ** (1%) and * (5%)

Table 8: Farmers access to extension services and credit

	Sorghum			Sunflower			Rice		
	CFs (n = 130)	NCFs (n = 116)	Total (n = 246)	CFs (n = 143)	NCFs (n = 54)	Total (N= 197)	CFs (n = 72)	NCFs (n = 170)	Total (N=242)
Extension service									
Yes	14.6%	9.6%	12.2%	46.8%	17.3%	38.9%	97.1%	20.0%	43.0%
No	85.4%	90.4%	87.8%	53.2%	82.7%	61.1%	2.9%	80.0%	57.0%
			1.43						119.35**
Extension provider									
NAADS	36.8%	37.5%	37.0%	6.2%	22.2%	8.1%	0.0%	43.3%	25.5%
Agribusiness/Agent	47.4%	37.5%	44.4%	78.4%	55.6%	74.7%	95.2%	0.0%	39.2%
Extension agent	15.8%	25.0%	18.6%	6.2%	0.0%	5.4%	4.8%	56.7%	35.3%
Other	0.0%	0.0%	0.0%	9.2%	22.2%	10.8%	0.0%	0.0%	0.0%
			0.38						47.10**
Credit									
Yes	2.3%	4.5%	3.4%	2.2%	2.0%	2.1%	85.3%	10.7%	33.0%
No	97.7%	95.5%	96.6%	97.8%	98.0%	97.9%	14.7%	89.3%	67.0%
			0.88						119.82**

Note: CFs = Contracted farmers; NCFs = Non contracted farmers; and significance levels: - ** (1%) and * (5%)

Table 9: Problems met by farmers during crop production and marketing

Problem	Sorghum			Sunflower			Rice		
	CFs (n = 130)	NCFs (n = 116)	Total (n = 246)	CFs (n = 143)	NCFs (n = 54)	Total (N= 197)	CFs (n = 72)	NCFs (n = 170)	Total (N=242)
High production costs	50.8%	50.0%	50.4%	44.1%	51.9%	46.2%	87.5%	90.0%	89.3%
High marketing costs	43.8%	35.3%	41.1%	40.6%	37.0%	39.6%	13.9%	42.9%	34.3%
Pests and diseases	49.2%	45.7%	47.6%	17.5%	5.6%	14.2%	58.3%	53.5%	55.0%
Birds	69.2%	67.2%	68.3%	60.1%	48.1%	56.9%	23.6%	8.2%	12.8%
High price of seed	15.4%	12.9%	14.2%	30.1%	16.7%	26.4%	-	-	-
Poor quality seed	-	-	-	29.4%	5.6%	22.8%	2.8%	7.6%	6.2%
Unreliable market	40.0%	48.3%	43.9%	35.0%	48.1%	38.6%	9.7%	38.2%	29.8%
Bad weather	20.0%	19.0%	19.5%	32.2%	27.8%	31.0%	16.7%	41.8%	34.3%
Delayed payment	25.4%	17.2%	21.5%	7.7%	1.9%	6.1%	-	-	-
Lack of adequate land	-	-	-	-	-	-	68.1%	44.7%	51.7%
Loss of soil fertility	-	-	-	15.4%	5.6%	12.7%	-	-	-
Other	16.9%	14.7%	15.9%	19.6%	1.9%	14.7%	9.7%	24.7%	20.2%
			0.236			9.81**			7.03**
			-			3.42			-
			-			-			-
			0.02			0.96			0.33
			1.85			0.20			18.94**
			0.31			4.57*			0.47
			0.11			2.30			10.71**
			0.30			3.62			-
			-			12.61**			2.06
			1.71			2.88			19.67**
			0.04			0.35			14.14**
			2.41			2.34			-
			-			-			11.04**

Note: CFs = Contracted farmers; NCFs = Non contracted farmers; and significance levels: - ** (1%) and * (5%)