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LEVELS OF LIVELIHOOD OUTCOMES AMONG SMALLHOLDER SUGARCANE OUTGROWERS IN MOROGORO REGION, TANZANIA

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ABSTRACT

Contract farming (CF) has much potential for improving household livelihood outcomes among sugarcane outgrowers for sugarcane outgrowers. However, studies debate on whether sugarcane outgrowers gain abilities (livelihood outcomes) or not from contract farming relations. As a response to the debates, this paper determines the levels of livelihood outcomes among smallholder sugarcane outgrowers in the study area, and specifically sought to measure levels of livelihood outcomes available among sugarcane smallholder farmers. The paper adopted a cross-sectional study design and 300 sugarcane outgrowers were interviewed. Using the IBM Statistical Package for Social Sciences (SPSS) Statistics, Version 20, data were analysed descriptively. It was further found that smallholder farmers in Kilombero Valley were categorized in low livelihood outcomes even though they had access to CF services through their farmers' associations and the sugarcane buyer. Therefore, it is recommended that, available sugarcane farmers' associations in the study area, in collaboration with the Sugar Board of Tanzania (SBT), should set plans for raising farmers' livelihood outcomes. In addition, it is recommended that contractual supports provided by sugarcane farmers' associations should increase farmers' association leaders' ability to negotiate for better prices of their sugarcane outputs.

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INTRODUCTION

Contract farming (CF) is one of the most debated institutional arrangements for production and marketing of agricultural commodities in developing countries (Oya, 2012). Contracting has been increasingly employed in traditional agricultural exports as well as in non-export sectors such as sugar beet, dairy and beef (World Bank, 2007; Raynolds, 2000 cited by Morrison *et al.*, 2006). Numerous studies of contract farming (CF) emphasize that CF has evolved in order to improve access to markets, credit and technology, management of risk, family employment, provision of agricultural extension services and, indirectly, empowerment of women and development of a successful commercial culture (Glover and Kusterer, 1990; Singh, 2006; Prowse, 2012). Although contracts offer scope for increased market access for farmers, they have often served to generate asymmetric power relations

to the relative disadvantage of smallholders (Covey and Stennis, 1985; Waswa *et al.*, 2012; Casaburi *et al.*, 2012). There are conflicting views on its impact to the welfare of smallholder farmers. Some authors argue that CF is beneficial to the smallholder farmers since it enables them to access ready markets and global markets (Chongela, 2008; Prowse, 2012). Such authors also argue that CF enhances income of farmers which they attribute to the economies of scale enjoyed in CF. On the other hand other authors argue that CF is a means of exploiting farmers by large agribusiness firms due to unequal bargaining power (Singh, 2002; Little and Watts, 1994 cited by Oya, 2012). They criticize CF on the basis that most of the contractual terms are too costly for smallholder farmers to comply with and that most large firms break the contractual terms at the expense of the smallholder due to unequal market power (Carney, 1988; Simmons *et al.*, 2005).

It is a fact that the sugar industry is one of the biggest large-scale agro-industries in Tanzania (Ngirwa, 2010). It involves smallholder farmers as outgrowers and estates owned by industries. Sugarcane in Tanzania is largely produced in Kilombero Valley (Kilombero and Kilosa Districts). In 2013, the valley had more than 8 000 sugarcane outgrowers, more than 5 000 being smallholders, with about 15 000 ha under cane production. The outgrowers supply 43% of the cane, which is crushed by two mills that are K1 which operates in Kilombero District and K2 which operates in Kilosa District (Amrouk *et al.*, 2013; Sulle *et al.*, 2014). The livelihoods of a large number of smallholders in the valley depend on small farms grown under a centralized outgrowers' scheme (Ellis and Freeman, 2004; Amrouk *et al.*, 2013). The centralized model referred to involves a centralized processor and/or buyer procuring from a large number of small-scale farmers (Rehber, 2007).

Adaption to the centralized model of CF in the Valley was essentially based on the assumption that the model has high potential for bringing about farmers' livelihood outcomes for high quality living standards. The model was anticipated to generate ability of farmers to use improved technologies, increase yield, save money, gain income, run nonfarm activities and improve assets. However, one of the expected livelihood outcomes (sugarcane yield) was low. The average yield among sugarcane contract farmers in Kilombero Valley is 12 tonnes per hectare, which is lower than the overall average (50 tons/ha) (Amrouk *et al.*, 2013) even though farmers had access to sugarcane contract farming in the study area. Livelihood outcomes as the achievements or outputs of livelihood strategies (DFID, 2001) are important to be established in terms of levels achieved in the valley. The need to establish the levels of livelihood outcomes follows the circumstance that Morogoro Region is typically listed in the lower income set of Tanzanian regions (Ellis and Mdoe, 2003) regardless of the fact that the region constitutes the largest sugar-producing area in Tanzania under contract farming services.

Studies carried out in Kenya and Tanzania, especially at Mtibwa Sugar, indicated that income distribution between sugarcane buyers companies and farmers were heavily skewed in favour of the companies and at the expense of farmers (Mshiu, 2007; Ngirwa, 2010; Waswa *et al.* 2012; Casaburi *et al.* 2012). Much of the literature assumes that outgrowers who are in sugarcane contract farming can have high quality living standards depending on their negotiation powers or farmers' representatives and the buyer(s) (Matango, 2006; Magongo, 2008; Oya, 2012) while others have contrary views (Mshiu, 2007; Ngirwa, 2010; Waswa *et al.* 2012; Casaburi *et al.* 2012). Literature, therefore, subjects the matter to discussion and more research is needed to make conclusion(s). In view of that, the main objective of this study was to determine levels of livelihood outcomes among smallholder outgrowers in Kilombero Valley.

MATERIALS AND METHODS

The study area

The study was conducted in Kilombero and Kilosa Districts, Tanzania. The two districts were selected for the study because they had larger proportions of sugarcane outgrowers (over 5 000 smallholder outgrowers) in Tanzania, and the two districts constitute the largest sugar-producing area in Tanzania with

the largest number of outgrowers (FARC, 2007 cited by Chongela, 2008; Sulle *et al.*, 2014). The sugar producing area lies East of the Udzungwa Mountains and extends to the North and South of the Great Ruaha River in Kilosa District (Ngirwa, 2010). The research was narrowed to six wards (Kidatu, Sanje, Mkula, Ruhembe, Kidodi, and Ruaha) whereby six farmers' associations were involved (Table 1). The six farmers' associations were selected based on the availability of large number of smallholder sugarcane farmers.

Research design, sampling procedure and sample size

A cross-sectional research design, whereby data were collected only once, was adopted (Bryman and Bell, 2011). Six wards (listed in Table 1) were purposively selected with the reason that they had farmers with farm sizes which ranged from 0.9 to 3.0 hectares (smallholders) (URT, 2013). Six farmers' associations which had more smallholder farmers during the 2013 harvesting season were purposively selected.

A total of 375 smallholder contract farming farmers were randomly selected using farmers associations' register books. Smallholder farmers' names were each written on an individual piece of paper, and the pieces were placed in a box (lottery technique) from which picking of names of farmers to be interviewed was done. The sample size was determined by employing Yamane formula as detailed below:

$$n = \frac{N}{1 + N(e^2)}$$

$$= \frac{5985}{1 + 5985(0.05)^2} = 375 \text{ (Yamane, 1967 cited by Israel, 2013)}$$

However, 80% of the 375 respondents were interviewed (300), due to difficulty in getting other potential respondents. In addition, the study selected 14 key informants based on their positions. These were six farmers' associations' administrative secretaries, six ward executive officers (WEOs), one member from the Sugar Board of Tanzania (SBT) and one KSCL representative-Outgrowers Manager.

Data collection

Quantitative data were collected using a structured questionnaire which included both closed and open-ended questions. The questionnaire was divided into two parts of questions. The first part aimed at seeking opinions of the farmers on if through sugarcane contract farming (outgrowers' scheme) they had generated ability to use improved technologies, increase yield, save money, gain income, run nonfarm activities and improve assets.

A smallholder farmer with at least one sugarcane harvesting season was interviewed. An eligible respondent was required to agree or disagree on each stated abilities, if he/she had managed to generate. Those who had generated the abilities were required to indicate yes (1), and to those who had not were required to respond no (0). The second part included follow up questions which assessed the acceptance or rejection status among the farmers. Qualitative data were collected through face to face interviews with the 14 key informants. Detailed explanations and some evidences were provided to validate their explanations. Information was documented in relation to the objective of this paper.

Data processing and analysis

Primary data were checked for completeness before coding, entered in the computer and verified for analysis. Quantitative data were analysed using IBM Statistical Package for Social Sciences (SPSS) Statistics, Version 20 and Microsoft Excel 2010. Livelihood outcome was measured by developing a livelihood outcomes index (LOI). LOI sought to assess whether smallholder farmers were able to increase sugarcane yield, undertake non-farm activities, use improved technologies, save money from sugarcane sold, gain income from sugarcane, and lastly if farmers had improved their assets. The response weights were yes (1) and no (0). Thereafter, each livelihood outcome was assigned points, and all the points were added up to get the overall scores on livelihood outcomes. The overall scores ranged from 0 to 6. This measure was finally categorized into three categories after computing the mean score (1.983), median (2.0), minimum (1) and maximum scores (4). In view of that, the categories were high livelihood outcomes (2.1 to 6.0), moderate livelihood outcomes (2.0), and low livelihood outcomes (1.0 to 1.9). It has to be noted that cut-off points were chosen by using the computed median. Therefore, median (2.0) was used as a moderate category.

RESULTS AND DISCUSSION

Levels of livelihood outcomes available among smallholder farmers

The mean score on the livelihood outcomes index was found to be 1.983, which was at a low level. These results imply that, generally, smallholder farmers in Kilombero valley were categorized in the low livelihood outcomes. Slightly less than two-fifths (37.3%) of the study sample had moderate livelihood outcomes (they scored 2.0 on the LOI); 36.0% were categorized as having low livelihood outcomes (they scored 1.0 to 1.9 on the LOI), and 26.7% were categorized as having high livelihood outcomes (they scored 2.1 to 6.0 on the LOI). The findings in Table 2 further indicate that the majority (75.9%) of farmers belonging to low level of livelihood outcomes said that they had not generated abilities from sugarcane CF. However, 45.6% of the farmers who belonged to the high livelihood outcomes category accepted to have generated abilities from sugarcane CF in the study area. The use of improved technologies ranked high (30.5%) among the abilities generated by farmers in the study area. On the other hand, farmers indicated that they did not gain income from sugarcane (19.2%) as well as increase sugarcane yield (19.0%) in the 2013 harvesting season (Table 2). The reason articulated by one male farmer from Sanje village was that:

“...I did not harvest for the past two years (2012 and 2013); the chance to harvest is very minimal and to get it either you give something... to the farmers’ association harvesting managers or shift to another association. It seems the supply of sugarcane from farmers is higher than the mill’s capacity...” (Interview, Sanje, 24 February 2014).

That quotation demonstrates a concern of farmers that the chances to harvest were limited, implying that they had no income from sugarcane grown. On the other hand, even if they could have managed to harvest during the next season, the canes may have overstayed and therefore the possibility to earn more yield was also questionable.

Farmers who did not gain abilities were mostly from the low livelihood outcomes category (Table 2). The harvesting arrangements observed in Kilombero Valley are contrary to the situation in Brazil where expansion of small scale sugarcane production and the use mechanized sugarcane harvesters are encouraged throughout the country. The mechanized harvesting in Sao Paulo State reached almost 85% in 2014 (Narimoto *et al.*, 2015). Mechanizing sugarcane harvesting as well as introducing more sugarcane mills in Kilombero Valley can improve livelihood outcomes of smallholder farmers.

Literature reviewed indicates that farmers who joined contract farming essentially aimed to achieve higher yields, incomes, improve assets, input usage and savings (Amrouk *et al.*, 2013). However, in several cases the anticipated achievements were reported to vary from one area to another, and to a large extent farmers reported to have not yet attained the expected livelihood outcomes when compared to big firms/farmers (Magongo, 2008; Casaburi *et al.*, 2012; Waswa *et al.*, 2012). Farmers were asked on their average sugarcane yield harvested during the 2013 season; the results showed that the mean sugarcane yield was 78.8 tons with a minimum of two (2) tons and a maximum of 320 tons. The largest proportion (36.7%) of the farmers had harvested 81 to 320 tons. The group with two (2) to 40 tons accounted for 32.6%. The proportion of households with 41 to 80 tons was relatively small, and they accounted for 30.7%. More than half (55.0%) of the farmers who had sugarcane yields during the 2013 season belonged to low livelihood outcomes category. The overall average sugarcane yield in the study area was 40 tons/ha, which was lower than the overall average of 50 tons/ha noted by Amrouk *et al.* (2013). It is argued that improper harvest of cane leads to loss of cane and sugar yield, and poor juice quality. This situation is likely to happen among small scale farmers as most of them use manual harvesting tools (hand knives) (Masute *et al.*, 2014).

The results further indicate that 40.1% of the farmers who belonged to low level of livelihood outcomes cultivated a total size of sugarcane land between one (1) and two (2) acres (21.4%) and two (2) and four (4) acres (18.7%). The findings imply that more farmers in the study area cultivated small land sizes of sugarcane between one (1) and four (4) acres (66.5%), and the rest of the farmers had sugarcane farms between five (5) and eight (8) acres (33.4%). The situation might have contributed to most of the farmers being in the low level of livelihood outcomes. Similarly, one of the female respondents at Ruhembe village said:

“... land, pesticides and fertilizers are very expensive, I and even others who are like me cannot manage to buy them. This is my fifth year cultivating two acres which I inherited from my late mother without using such inputs...” (Interview, Ruhembe, 21 February 2014). That quotation demonstrates a concern of farmers that there were limited capacities to expand their farms as well as using improved farm inputs. Findings from similar studies undertaken in Kilombero valley have indicated that the majority of the farmers also had sugarcane land between one (1) and four (4) acres (Ngirwa, 2010; Amrouk *et al.*, 2013; Sulle *et al.*, 2014). When you compare findings of the previous studies with the results generated by this study on the sugarcane land cultivated, it implies that the expansion of sugarcane farms among smallholder farmers in the study area was limited.

Table 1: Sample size

Farmers' Association Name	Sugarcane Outgrowers 2013/14	Smallholder Sugarcane Outgrowers 2013/14	Smallholder Farmers interviewed (5 %)
Ruhembe Cane Growers Association (RCGA)	4 000	2 480	124
Kilombero Cane Growers Association (KCGA)	2 500	1 375	69
Msolwa Ujamaa Cane Growers Association (MUCGA)	969	629	32
Bonye Cane Growers Association (BCGA)	780	608	30
Msindazi Cane Growers Association (MCGA)	760	595	30
Kidatu Ikela Cane Growers Association (KICGA)	426	298	15
Total	9 435	5 985	300

Source: Sugarcane Farmers' Associations (2013)

Table 2. Farmers who generated abilities through contract farming (n = 300)

Type of ability generated	Levels of livelihood outcomes						Total (%)	
	Low (%)		Moderate (%)		Higher (%)		Yes	No
	Yes	No	Yes	No	Yes	No		
If sugarcane yield increased in the previous harvesting season	0.1	16.1	6.9	2.9	6.5	0.0	13.6	19.0
If non-farm activities undertaken in the previous harvesting season	4.1	11.9	4.9	4.5	5.6	1.9	14.6	18.2
If used improved sugarcane farming technologies in the previous harvesting season	6.2	4.4	9.0	1.4	15.4	0.3	30.5	6.1
Saved money from sugarcane sold in the previous harvesting season	4.9	12.5	3.7	5.4	5.4	0.9	14.0	18.7
Gained income from sugarcane sold in the previous harvesting season	1.4	15.1	5.8	3.8	6.2	0.3	13.3	19.2
Improved assets in the previous harvesting season	0.3	16.0	7.2	2.7	6.5	0.0	14.0	18.7
Total percentage	17.0	75.9	37.4	20.8	45.6	3.3	100.0	100.0

This was likely to happen because smallholder sugarcane farmers had small chances to harvest their produce as certified by an interviewee at Ruhembe. Likewise, farmers were asked if they had gained monetary value from sugarcane in the 2013 harvesting season. The findings indicate that 55.1% of the farmers belonging to low levels of livelihood outcomes had gained monetary value from sugarcane in the 2013 season. The results further indicated that 47.0% of the farmers in the study area had net monetary value of 2 231 000 TZS and above from sugarcane in the 2013 harvesting season. The group of farmers who had net monetary value of 831 to 2 300 000 TZS from sugarcane accounted for 37.6%. The proportion of households with 0 to 831 000 TZS was relatively small, and they accounted for 15.4%. The findings imply that the majority of farmers in the study area gained monetary value from sugarcane harvest, although most of them belonged to low level of the livelihood outcomes. A study by Swain (2008) affirms that contract farming can assist a good number of farmers to gain monetary value. However, it may possibly lock farmers into a situation of low livelihood outcomes when expected benefits do not materialize because of low price or crop rejection or crop failure. Accordingly, it was observed that 59.0% of the farmers did not have any monetary value from other crops apart from sugarcane. Out of the 59.0%, 38.0% of the farmers belonged to low levels of livelihood outcomes. However, 17.0% of the farmers who belonged to low level livelihood outcomes had monetary values from other crops apart from sugarcane. The results indicate that the mean monetary value from other crops was 499 810 TZS with a minimum of 0 TZS and a maximum of 12 825 000 TZS. The proportion of farmers who did not gain any monetary value from other crops was high, and they accounted for 59.0%. The results imply that the majority of the farmers did not gain any monetary value from other crops, and therefore they relied much on non-farm activities. The fact was also pointed out by one male respondent from Kidatu village who said:

“Previously I used to cultivate paddy and maize, but I shifted to sugarcane farming two years ago (2012) when the price rose up to 60 000 TZS per ton. Now (2014) the sugarcane price is low; I still have canes in the farm but my everyday life depends much on my small shop”(Interview, Kidatu, 20 February 2014). The researcher also asked farmers if they saved money from sugarcane harvest in the 2013 season. The results indicate that 62.3% of the farmers did not have any saving from sugarcane harvest. Out of the 62.3%, 42.0% of the farmers belonged to low levels of livelihood outcomes. However, 12.9% of the farmers who belonged to low level livelihood outcomes had savings from sugarcane sold in the 2013 harvesting season. The results imply that the majority of the farmers did not have savings from sugarcane they sold in the 2013 harvesting season. The mean amount of money saved from sugarcane sold was 377 016 TZS with a minimum of 0 TZS and a maximum of 801 575 TZS. Previous studies have indicated that smallholder farmers failed to make savings from sugarcane sales because sugarcane contract farming was proved to be a costly business due to the deductions made by farmers' associations and the buyer to meet the costs of pre-production services (Waswa *et al.* 2009; Waswa *et al.*, 2012; Girei and Giroh, 2012). The discussion with the farmers' associations' secretaries from Ruhembe Cane Growers Associations (RCGA) and Kilombero Cane Growers Association (KCGA) also indicated that smallholder farmers who managed to make savings from the sugarcane they sold were those who gained substantial income from other crops or non-farm activities. This means that it was not easy to make saving from sugarcane sales only.

CONCLUSION AND RECOMMENDATION

It is concluded that the majority of smallholder farmers under outgrowers' scheme in the study area had lower livelihood outcomes even though they had chances of getting CF services through farmers' associations and the sugarcane buyer.

Therefore, it is recommended that available sugarcane farmers' associations (FAs) in the study area, through collaboration with the Sugar Board of Tanzania (SBT), should set plans of raising farmers' livelihood outcomes. Planning exercises should start at the Farmers Associations level and be shared through formal platforms with the Tanzania Sugarcane Growers Association (TASGA), National Sugar Institute and the SBT. In addition, it is recommended that contractual supports provided by sugarcane farmers' associations should increase farmers' association leaders' ability to negotiate for better prices of their sugarcane outputs.

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