Livelihood Outcomes Among Households Participating in Large-Scale Agricultural Investments in Kilombero Valley, Tanzania

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Abstract[1]

Large-scale agricultural investment is an important economic activity which has potential to improve the livelihoods of Male-Headed Households (MHHs) and Female-Headed Households (FHHs). (However, the benefit derived from large-scale agricultural investments has a household headship and agricultural investments models differential. The study was conducted in Kilombero Valley in Tanzania to assess livelihood outcomes among households engaged in large-scale agricultural investments through outgrowers scheme and investor farm employment. The study adopted a cross-sectional research design using exploratory sequential data collection and analysis approach and involved 376 respondents. Income and asset monetary value were used as proxy indicator of wealth status. Qualitative data were analysed by using content analysis while a multiple responses analysis, Chi-square test, T-test, and One-Way Analysis of Variance (ANOVA) were employed for quantitative data analysis. It was found that MHHs participating in out-grower scheme had more opportunities than FHHs The livelihood outcomes between MHHs and FHHs were statistically significant The livelihood outcomes among out-growers, investor farm workers and non-participants was statistically significant. The differences in livelihood outcomes are attributed to one's engagement in large-scale agricultural investments through out-grower scheme. However, MHHs derived more benefits in large-scale agricultural investments due to dominance in out-grower associations. The study recommends the local government authority and non-governmental organizations involved in promoting livelihood improvement through large-scale agricultural investments to promote FHHs ownership of resources by allowing more FHHs to access and control over productive resources This can be done by strengthening out-growers association through training out-growers on their roles in contract with investors and by ensuring that out-growers are represented in every decision that affects their payments from sugarcane sales, especially in measuring sugarcane sucrose level.

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1.0 Introduction

Large-scale agricultural investments that integrate household in out-grower scheme and investor farm employment are important in improving household livelihood outcomes (Hichaambwa and Matenga, 2016; Schupbach, 2014).According to FAO (2012), Large-scale agriculture investment refers to purchase of land and user rights through lease or concessions, whether for a short period or a long term. This study conceptualizes large-scale agriculture investment as a process whereby foreign governments, local and foreign companies are leased tracts of arable land for large-scale agriculture with out-grower scheme model or plantation scheme. Studies in developing countries have reported that large-scale agricultural investment increases significantly household livelihood outcomes. These studies include empirical evidence in Ethiopia (Baumgartner *et al*., 2015), Timor (ILO, 2017), Zambia (Matenga, 2016), Zimbabwe (Mutopo *et al.*, 2015), Mozambique (Knapman and Sutz, 2015), Ghana (Yaro, 2017) and Vietnam (Saigenji, 2010). In addition, households involved in out-grower schemes in which smallholder farmers produce cash crops on their own land, as out-growers on contract to agro-processing companies, benefit most farmers (Glover and Jones 2016; Herrmann, 2017; Matenga 2014; Sokchea and Culas, 2015). Out-growers enjoy benefits such as access to agricultural inputs, credit or technical assistance, increased income and assured market for their produce (Schupbach, 2014).

On the other hand, large-scale agricultural investments have been reported to contribute to widening household income inequalities (Rocca, 2016) and affect negatively household livelihoods (Matenga and Hichaambwa 2017; Nolte and Ostermeier, 2017). Out-grower

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scheme in sugarcane production is reported to have poor contribution to household livelihood outcomes due to complex reasons (Glover and Jones 2016; Mwambi *et al*., 2016; Ripley, 2017; Wendimu *et al.*, 2016). These include low sucrose level, unfair system of weighing cane and payment calculations, lack of sufficient factory space to crush cane, corruption, delay in picking cane from out-growers and delay in farm inputs from out-grower associations (Cai *et al.*, 2008; Glover and Kusterer, 1990). Households participating in investor farm employment have also been reported to be affected negatively as large scale agricultural investments employment is characterized by seasonal low wages with poor working conditions as well as payment deductions and lack of transparency in wage system (Hall *et al*.,2017; Matenga and Hichaambwa 2017) that in turn affects household livelihood outcomes.

Previous studies show that different models of large-scale agricultural investments affect livelihood of different categories of households. Matenga and Hichaambwa (2017), for instance, have argued that large-scale agricultural investments result in heterogeneous impacts on different segments of social groups. The argument is because large-scale agricultural investments that integrate smallholder farmers in production of crops leading to more chances to achieve high levels of wealth. Rocca (2016), calls this integration as out-grower scheme which involves large-scale production and processing facilities surrounded by out-growers' farms that range widely in size. In contrast, Hall *et al.* (2017) claim that large-scale agricultural investments that adopt plantation scheme offer employment opportunities to rural communities. However, the contribution of plantation scheme through employment generation is minimal due to temporary, casual employment and low wages (Hichaambwa and Matenga, 2016). It is worth noting that households are

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not a homogenous group, and in that case, there is differentiation in terms of how they are affected by different models of large-scale agricultural investments.

Household headship is likely to affect the probability of participating in out-grower scheme or to engage in employment on large-scale farms due to differences in opportunities, motivation and capabilities (Schupbach, 2014). FHHs' (widow, separated, single and divorced) livelihood outcomes are likely to be disadvantaged compared to MHHs. For instance, Osabuohien *et al.* (2016) reported that large-scale agricultural investments have a negative effect on the welfare of FHHs located in communities with large-scale agricultural investment. Their findings further reveal that FHHs working in investor farm employment earned slightly lower agricultural wages compared to those not working in large-scale agricultural investments.

Despite there being many other studies on the contribution of large-scale agricultural investments in the livelihood improvement (Wendimu *et al*., 2016; Hall *et al*., 2017; Matenga and Hichaambwa, 2017; Yaro, 2017). There has been less focus on household headship outcome of large-scale agricultural investments. Hence, the differences in the livelihood outcomes between MHHs and FHHs have remain unknown at least in the context of the study area. Furthermore, the household headship outcomes of large-scale agricultural investments are difficult to generalize as they are affected by different location specific gender norms, culture, traditions and large-scale agricultural investments models (Cotula *et al*., 2015; Smalley, 2013). Therefore, it is important to have empirical evidences from diverse backgrounds. Such information is useful for policy makers, researcher and development partner especially those engaged in promoting gender equity and bringing about women empowerment. Therefore, this paper provides empirical evidence on

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livelihood outcomes among MHHs and FHHs engaged in out-grower scheme, investor farm employment and non-participants in Kilombero Valley. This study is anchored on the sustainable livelihood framework as described by DFID focus on how the resources are used as an asset to improve human wellbeing and promoting development by considering livelihood asset, process and structures and livelihood strategies to achieve livelihood outcomes (Wendimu *et al*., 2016).

2.0 Methodology

The study was conducted in Kilombero Valley in Kilombero District where four Villages namely Msolwa Ujamaa, Sanje, Mchombe and Mngeta were selected purposively; the Villages have the largest number of out-growers and households working in large-scale agricultural investments in KilomberoValley. A cross-sectional research design was adopted to explain the relationship between variables at one time. The sampling unit was a household and exploratory sequential research strategy was adopted involving initial phase of qualitative data collection and analysis which was followed by a phase of quantitative data collection and analysis. The qualitative phase of data collection involved Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). Seven FGDs were conducted. The FGDs involved participants who were knowledgeable in out-grower scheme and investor farm employment with each FGD having participants ranging between six and eight. Based on their position and knowledge in relation to the study objectives, fourteen KIIs were purposely selected. These includes two out-grower association administrative secretaries, three Ward Executive Officers (WEOs), four Village Executive Officers (VEOs), two representative from KPL and KSCL, one representative from SAGGOT, one

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representative from Sugar Board of Tanzania and Kilombero District Agricultural, Irrigation and Cooperative Officer (DAICO).

The quantitative data collection involved household survey whereby 376 households were involved. Proportionate stratified sampling using a household Village register was applied to determine a sub-sample from each Village as shown in Table 1.Thereafter, simple random sampling was used to pick respondents from each Village.

Table 1: Sample households from selected Villages

Village	Households	MHH	FHH	Out-growers	Investor farm worker	Non-Participants	Sample size
Mngeta	1286	77	10	-	38	49	87
Mchombe	1650	77	12	-	42	47	89
MsolwaUjamaa	1832	78	44	44	31	47	122
Sanje	1146	64	14	41	18	22	76
Total	5914	296	80	85	129	165	400

Qualitative data were analysed by using content analysis whereby information pieces were organized into different themes and compared based on study objectives. Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS), Version 20. Multiple responses analysis and chi-square tests were used to analyse constraints and opportunities of large-scale agricultural investments while independent samples t-test and One Way Analysis of Variance were used to compare livelihood outcomes among households. Livelihood outcome was measured by aggregating total household income and household total asset values as adapted from Wendimu (2015) expressed as

$$LO=\ln\left(\sum_{i=1}^{n} HI + \sum_{i=1}^{n} AMV\right)$$

Where,

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LO=Household livelihood outcome,

ln=the natural logarithm,

HI= Household income, and

AMV= Household asset monetary value.

Total household income was based on annual cash earnings of the households from farm income, off-farm income and other sources (i.e. remittances, rental and pension). Household total assets monetary value was computed by aggregating the market value of all assets that household owned.

3.1 Results and Discussion

3.2 Opportunities and Challenges of Large-Scale Agricultural Investments

3.1.1 Opportunities of Out-grower Scheme

The study revealed that there were statistical significance association between opportunities for household engaging in out-grower scheme and household head type ($\chi^2 = 38.44$; $p<0.05$), (Table 2).

Table 2: Opportunities of out-grower scheme (n=85)

Opportunities	MHHs Counts	FHHs Counts	Total counts	Chi-square/Sig.
Increased income	31	12	43	38.438
Access to credit	30	26	56	
Access to transport services	30	23	53	0.000*
Higher price for sugarcane	12	1	13	
Access to market	29	23	52	
Access to extension services	22	16	38	

*The Chi-square statistic is significant at the 0.05 level

The results give an emphasis that MHHs have more chances to improve their livelihood outcomes since they enjoy most opportunities from out-grower scheme which can boost their sugarcane production and thus increase income received from sugarcane production.

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Similar findings were reported by Hall *et al*. (2015) who found that out-growers, especially MHHs, enjoy benefits like increased access to credit and increased income.

3.1.2 Constraints to Out-grower Scheme

The study revealed that there were no statistically significant association between constraints for households engaging in out-grower scheme and household headship (χ 2 =10.29; $p<0.05$), (Table 3). This implies that MHHs and FHHs participating in out-grower scheme share the same constraints. All MHHs and FHHs participating in out-grower scheme pointed out that low sucrose level is their major constraints.

Table 3: Constraints to Out-grower Scheme (n=85)

Constraints	MHHs Counts	FHHs Counts	Total counts	Chi-square/Sig.
Low sucrose level	57	28	85	10.289
Unfair system of weighing sugarcane and payment calculation	41	27	68	0.067
Lack of sufficient factory space	28	9	37	
Corruption	23	17	40	
Sugarcane not picked on time	36	17	53	
Exclusion of out-grower in price setting	35	19	54	
Delay in farm inputs	17	3	20	
Difficult in acquiring land	17	8	25	

The Chi-square statistic is not significant at the 0.05 level

Results of focus group discussions (FGDs) supported the findings, for example, in one of FGDs it was noted that:

> "…The *problem of corruption in measuring sucrose level is a threat to out-growers and results into low payments. If you want your sugarcane to record higher sucrose level you have to bribe the one who is measuring sucrose level, and your sugarcane will get higher sucrose level up to 15. But if you don't give them*

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money, sucrose level will read 5-7, which is very low" (A 55 years old FGDs participant in Msolwa Ujamaa Village).

This finding indicates that corruption in measuring sucrose level is a threat to out-growers and has implications on the income that households will receive from sugar cane selling. Households who are not ready to bribe the responsible person in measuring sucrose level end up getting low sucrose level resulting into low payments. Studies have indicated that there is a serious lack of trust and openness in sucrose measurement but also in weighing cane deliveries and calculating out-growers' payments (Key and Runsten, 1999; Poulton *et al*., 2010; Smalley, 2013; Smalley, 2014 and Smalley *et al.,* 2014). Sucrose level also depends on agronomic practices and if out-growers are not adhering to recommended agronomic practices, out-growers might record low sucrose level. Discussion with KSCL extension officer confirmed that there has been record of low sucrose level in the past years. When sugarcane remain in farm for long time without being harvested it can also result in decrease in yield and decline in sugar content. Smalley *et al. (*2014) shared similar concern that decline in sucrose level has agronomic explanations like: farmers harvesting cane before it is mature; inadequate or fake fertilizer application; lack of irrigation; smut disease and white scale pest; and cane being harvested too late in the season.

3.1.3 Constraints of investor farm employment

The study revealed that there were no statistically significant association between constraints for households participating in investor farm employment and household head type (χ 2 =9.09; p<0.05), (Table 4).

Table 4: Constraints of investor farm employment (n=126)

Constraints	MHHs Counts	FHHs Counts	Total counts	Chi-square/Sig.

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Low wages	85	11	96	9.090
Seasonal condition of work	47	10	57	
Poor work condition	82	5	87	0.106
Payment deductions	22	3	25	
Lack of transparency in wage system	50	5	55	
Large portion of task	62	10	72	

The Chi-square statistic is not significant at the 0.05 level

These findings give emphasize that both MHHs and FHHs were affected by low wages, lack of transparency in wage system and payment deduction. This can be because most permanent employments in large-scale agricultural investments require well-trained personnel who, in most cases, are not available in rural areas. The findings in Table 4 were also supported by KIIs that:

> "*Most of those employed on a permanent basis are from other areas. The households surrounding large-scale agricultural investments are employed as causal labourers although there are more men as in the case of sugarcane cutters who are employed in weeding while they are waiting for sugarcane harvesting"* (KIIs participant in Sanje Village, 6th October 2016)

This suggests that men occupy most of wage employments created by large-scale agricultural investments. The studies by Matenga and Hichaambwa, (2016) in Zambia found that wage employment created by large-scale agricultural investments are gendered with men securing most of permanent employment leaving women with casual, insecure and poorly paid seasonal wage employment.

3.2 Livelihood Outcomes among Male and Female-Headed Households

The results from an independent samples t-test showed that there was a significant difference in livelihood outcomes by household headship ($p<0.05$) as indicated in Table 5.

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Table5: Livelihood outcomes among MHHs and FHHs

Variable	Household headship	n	Mean livelihood outcome	F-value	Sig.
Livelihood outcomes	MHHs	293	15.013.	0.567*	0.005
	FHHs	79	14.923		

*Means significant at the 5% level

This can be explained by the fact that large-scale agricultural investments benefit more MHHs than FHHs. In most cases, investor farm employment opportunities tend to produce gender differentiated casual labour with MHHs securing higher wages compared to FHHs. It can also be explained by the fact that out-grower schemes tend to benefit more MHHs than FHHs. Osabuohien *et al.* (2016) and Wendimu *et al.* (2016) reported similar findings that large-scale agricultural investments result into low welfare of FHHs located in communities with large-scale agricultural investments. Moreover, Hall *et al*. (2015) and Sulle (2017) found that large-scale agricultural investments have potential gender impacts with FHHs being affected more in terms of wages they receive from investor farm employment.

3.3 Livelihood Outcomes among Out-grower, Investor Farm Workers and Non-Participants

The results indicate that there were statistically significant differences in livelihood outcomes among households in out-grower scheme, investor farm workers and non-participants at $p< 0.05$ (Table 6).

Table 6: Livelihood outcomes among out-growers, investor farm wage workers and non-participants

Variable	Household Category	n	Mean livelihood outcome	F-Value	Sig.
Livelihood Outcomes	Farm wage worker	128	14.448	33.360*	0.000
	Non-Participant	162	15.011		
	Out-grower	82	15.819		

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	Total	373	14.99

*Mean Significant at 5% level

According to Pallant (2011), if there are statistical significant results from the analyses, it suggests that there is a difference somewhere between groups. However, it does not specify which groups differ from one another. To compare each pair, multiple comparisons were used to identify the difference in livelihood outcome for each pair of household. The results from multiple comparisons (Table 7) point out that livelihood outcome were significantly difference for out-grower, non-participants and investor farm employment.

Table 7: Multiple comparisons for livelihood outcomes among out-grower, investor farm workers and non-participants.

(I) Respondents category	(J) Respondent category	Means Differences (I-J)	Sig.
Investor Farm wage worker	Non-Participant	-0.562*	0.000
	Out-grower	-1.371*	0.000
Non-Participant	Farm wage worker	0.562*	0.000
	Out-grower	-0.808*	0.000
Out-grower	Farm wage worker	1.371*	0.000
	Non-Participants	0.808*	0.000

*The mean difference is significant at 0.01, F=33.360

This indicates that large-scale agricultural investment with out-grower scheme has resulted into improved household livelihood outcomes for participating households. This is expected as out-grower schemes are associated with credit schemes, input provision that can increase crop productivity and hence increase income that households receive from selling sugarcane. Previous studies have indicated that large-scale agricultural investments that adopt out-grower scheme model have resulted into positive effects on livelihood of participating households (Hall *et al*., 2015; Hall *et al., 2017;* Herrmann, *2017;* Schupbach, 2014 and Yaro *et al., 2017*). Matenga and Hichaambwa, (2017) also reported that effect of large-scale agricultural investments to rural communities has resulted into low livelihood outcome for household participating in investor farm employment. Given that investor

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farm employment is characterized by low wages and seasonality nature of work, it is obvious that households participating in investor farm employment will get low livelihood outcomes. Likewise, studies by Herrmann, (2017); Herrmann and Grote, (2015); Osabuohien, (2014); Osabuohien *et al*., (2016) reported that out-growers achieved significantly higher livelihood outcome compared to non-participants and those working in investor farm employment.

3.4 Livelihood outcome among households across Villages

The finding indicated that there were no statistically significant differences in livelihood outcomes across Villages at $p< 0.05$ (Table 8). It was anticipated that households in Villages with large-scale agricultural investments that have adopted out-grower scheme would record higher livelihood outcomes than those that have adopted plantation scheme model.

Table 8: Livelihood outcomes across Villages

Variable	Village	n	Mean livelihood outcome	F-Value	Sig.
Livelihood Outcomes	Mngeta	87	15.067	0.944	0.420
	Mchombe	89	14.871		
	Msolwaujamaa	122	14.922		
	Sanje	78	15.162		
	Total	**376**	**14.994**		

Mean Significant at the 5% level

These findings give emphasis that out-grower scheme has not contributed to improved livelihood outcome to the surrounding communities. This is attributed to increasing pressure on land for sugarcane production and elite capture of land close to sugarcane producing areas. During KIIs it was reported that:

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> "…*There is growing elite capture of land in this Village as a result poor out-growers are at risk of being marginalized" (*KIIs participant in Msolwa Ujamaa Village, 10th October 2016)

The FGDs participants also share similar concern. During FGDs session in Sanje Village it was reported in one of the FGDs that:

> "… *Households in sugarcane growing areas are facing increasing land demand and this has resulted into household commuting in Ikule, Signali and Kiberege Villages to grow food crops*" (*FGDs participant in Sanje Village, 11th October 2016).*

Increasing land demand and elite capture has implication on household food security as well as household allocation of labour in two locations. A study by Sulle, (2017) found that there is growing land demand due to estate or out-grower scheme expansions which has reduced land availability for smallholder out-growers and hence reduce their livelihood outcomes. Nombo, (2010) reported that due to increasing land demand in sugarcane growing areas, households are forced to acquire land in far-way Villages.

4.0. Conclusions and Policy Recommendations

Large-scale agricultural investment in Kilombero Valley has potential to improve the livelihood outcomes. Out-grower scheme has been found to improve households' wellbeing through increase in income and asset monetary value. Furthermore, the livelihood outcomes among MHHs and FHHs participating in large-scale agricultural investments revealed a household headship differential whereby MHHs derive more benefit from their engagement in large-scale agricultural investments. In order to bring the equitable livelihood outcomes among households' participating in large-scale agricultural

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investments; study recommend the local government authority and non-governmental organizations involved promoting livelihood improvement through large-scale agricultural investments to promote FHHs ownership of resources by allowing more FHHs to access and control over productive resources including sugarcane land and addressconstraints for household participation in out-grower scheme. This can be done by strengthening out-growers association through training out-growers on their roles in contract with investors and by ensuring that out-growers are represented in every decision that affects their payments from sugarcane sales, especially in measuring sugarcane sucrose level. KSCL should be encouraged to increase the capacity for crushing sugarcane in order to enable more out-growers to sell their sugarcane.

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