

**SOCIO-ECONOMIC DETERMINANTS OF HOUSEHOLD PARTICIPATION IN
LARGE-SCALE AGRICULTURAL INVESTMENTS AND ITS INFLUENCE ON
LIVELIHOOD OUTCOMES IN KILOMBERO VALLEY, TANZANIA**

ELIMELECK PARMENA AKYOO

**A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY OF SOKOINE UNIVERSITY OF
AGRICULTURE. MOROGORO, TANZANIA.**

EXTENDED ABSTRACT

Large-scale agricultural investments have the potential of improving household livelihood outcomes among households participating in the out-grower schemes and in the investor farm wage employment. However, there is no consensus whether large-scale agricultural investments generate better livelihood outcomes for participating households. This study was conducted in Kilombero Valley in Tanzania to examine socio-economic determinants of household participation in large-scale agricultural investments and the influence of socio-economic characteristics and large-scale agricultural investments on household livelihood outcomes. Data were collected through Key Informant Interviews (KIIs), Focus Group Discussions (FGDs) and involving a sample of 376 households in the survey. Content analysis was used to analyse qualitative data. Quantitative data were analysed using Statistical Package for Social Sciences (SPSS). The analysis was done using the following techniques: descriptive statistics, multiple responses analysis, binary logistic regression, One Way Analysis of Variance (ANOVA), independent samples t-test and multiple regression. The results show that there were associations between out-growers scheme opportunities and household headship with Male-Headed Households (MHHs) enjoying more benefits. There were differences between households participating in sugarcane out-grower scheme, the non-participants and investor farm wage employment in terms of livelihood outcomes ($p < 0.05$) with MHHs having higher livelihood outcomes. There was a difference in livelihood outcomes by household headship ($p < 0.05$) and MHHs had higher livelihood outcomes. The most important predictors of household participation in the out-grower schemes were age, household headship, and group membership, access to credit, distance to investor, asset stocks and asset ownership ($p < 0.05$). Household participation in the investor farm wage employment was influenced by age, household headship, marital status, land size, asset stocks and income ($p < 0.05$).

The age of household head, years of schooling, household size, land size, group membership, household participation in the out-grower scheme, and livelihood strategies had influence on household livelihood outcomes ($p < 0.05$). Therefore, MHHs participating in the out-grower schemes derived more benefits in terms of opportunities and showed possibilities of having higher livelihood outcomes than FHHs. Households' participation in the out-grower scheme is influenced by socio-economic characteristics including gender variables. Also, household participation in the investor farm wage employment reflected gender differences with MHHs and married household heads having higher chances of participating in the investor farm employment. Out-growers benefit more from large-scale agricultural investments compared to investor farm workers and to non-participants. Household livelihood outcomes depend on household socio-economic characteristics and household participation in large-scale agricultural investment through the out-grower schemes. The study recommends that Local Government Authorities and non-governmental organizations involved in promoting livelihood improvement through large-scale agricultural investments should train out-growers on the diversification of livelihood strategies, group strengthening and promoting gender dialogues in the community with a view to changing gender norms that discriminate against FHHs from participating in the out-grower schemes as well as promoting FHHs ownership of sugarcane land. Out-grower associations, in collaboration with investors, should set up plans to ensure that there is a representation of out-growers in every decision making process that affects their payments and raise household livelihood outcomes by raising the minimum wages of those working in the investor farms.

DECLARATION

I, Elimeleck Parmena Akyoo do hereby declare to the Senate of Sokoine University of Agriculture that this thesis is my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted in any other institution.

Elimeleck Parmena Akyoo
(PhD Candidate)

Date

The above declaration is confirmed by;

Dr. John N. Jeckoniah
(Supervisor)

Date

Dr. Samwel J. Kabote
(Supervisor)

Date

COPYRIGHT

No part of this thesis may be reproduced, stored in any retrieval system, or transmitted in any form or by any means without prior written permission of the author or Sokoine University of Agriculture in that behalf.

ACKNOWLEDGEMENTS

I am grateful to my employer, Tanzania Institute of Accountancy and my family for financing this research work. I highly appreciate the logistics given by the leaders of out-grower scheme in Sanje and Msolwa Ujamaa Villages. I am most grateful to my supervisors, Dr. John N. Jeckoniah and Dr. Samwel J. Kabote, both from the Department of Development Studies (DDS)-College of Social Sciences and Humanities (CSSH), Sokoine University of Agriculture (SUA), for their invaluable advice, constructive criticisms, guidance and academic support during the research work, which made possible the successful and timely completion of my PhD programme. I also extend thanks to all CSSH/SUA staff and my fellow PhD candidates in DDS for their cooperation and encouragement during the entire study period.

I thank discussants of presented manuscripts Dr. Anna N. Sikira, Dr. Emanuel E. Chingonikaya, Prof. David Mhando, Prof. Kim A. Kayunze and Prof. J. K. Urassa for their constructive criticisms, comments and enthusiastic support, which in many ways contributed to the quality of my research and strengthened my academic career. To them I say thank you very much.

Many thanks are also directed to Kilombero District Agriculture, Irrigation and Cooperative Officer (DAICO), Ward and Village Executive Officers for their cooperation during data collection. Also thanks are due to households, out-grower leaders, out-grower managers and Kilombero Sugar Company Limited (KSCL) and Kilombero Plantation Limited (KPL) officials for their hospitality, kindness and time devotion in answering my questions. I am grateful to all respondents who devoted their time to participate in this study. Finally, I am most grateful and indebted to my lovely wife, Penina Akyoo, my

children James, Jensen and Janice for their moral support and for being patient during my studies.

DEDICATION

This work is dedicated to my late beloved father Parmena Shaushi Rasirasi Akyoo who passed away before the dreams of this work could be realised; to my mother Eliatirisha Kinisa Nnko, Rasirasi family, Kinisa family and Iramba family for their love and patience.

TABLE OF CONTENTS

EXTENDED ABSTRACT	ii
DECLARATION	iv
COPYRIGHT.....	v
ACKNOWLEDGEMENTS	vi
DEDICATION	viii
TABLE OF CONTENTS	ix
LIST OF TABLES	xiii
LIST OF FIGURES.....	xiv
LIST OF APPENDICES	xv
LIST OF ABBREVIATIONS AND ACRONYMS.....	xvi
CHAPTER ONE	1
1.0 INTRODUCTION	1
1.1 Background to the Problem	1
1.1.1 Large-scale agricultural investments: global and regional debates	1
1.1.2 Large-scale agricultural investments in Tanzania	5
1.2 Statement of the Problem.....	9
1.3 Justification for the Study.....	11
1.4 Objectives	12
1.4.1 Overall objective.....	12
1.4.2 Specific objectives	12
1.5 Research Questions and Hypothesis.....	13
1.5.1 Research questions.....	13
1.5.2 Research hypotheses	13

1.6	Theoretical Framework.....	14
1.6.1	Sustainable livelihood framework (SLF).....	14
1.6.2	Feminist political economy theory	16
1.7	Conceptual Framework.....	17
1.8	Organization of the Thesis.....	20
	References.....	22
CHAPTER TWO		34
Livelihood Outcomes among Households Participating in Large-scale Agricultural Investments in Kilombero Valley, Tanzania.....		34
	Abstract.....	34
1.0	Introduction.....	36
2.0	Methodology.....	39
3.0	Results and Discussion	41
3.1	Opportunities and Challenges of Large-Scale Agricultural Investments	42
3.1.1	Opportunities of out-grower scheme by household headship.....	42
3.1.2	Constraints to out-grower Scheme by household headship.....	42
3.1.3	Constraints of investor farm employment by household headship.....	44
3.2	Livelihood Outcomes among Male and Female-Headed Households	46
3.3	Livelihood Outcomes among Out-grower, Investor Farm Workers and Non- Participants	47
3.4	Livelihood Outcome among Households across Villages	49
4.0	Conclusions and Policy Recommendations.....	50
	References.....	51
CHAPTER THREE.....		57

Socio-Economic Determinants of Household Participation in Out-growers Scheme and Investor Farm Employment in Kilombero Valley, Tanzania	57
Abstract.....	57
1.0 Introduction.....	58
2.0 Methodology.....	61
3.0 Results and Discussion	64
3.1 Household's Characteristics	64
3.2 Socio-Economic factors for Household Engagement in Out-growers Scheme.....	67
3.3 Socio-Economic factors for Household Engagement in Investor Farm Employment.....	72
3.4 Conclusions and Recommendations	77
References.....	78
 CHAPTER FOUR	86
The Influence of Household Socio-economic Characteristics and Large-scale Agricultural Investment Factors on Household Livelihood Outcomes in Kilombero Valley, Tanzania	86
Abstract.....	86
1.0 Introduction.....	88
2.0 Methodology.....	92
3.0 Results and Discussion	98
3.1 Household Socio-economic Characteristics	98
3.2 Factors Influencing Household Livelihood Outcome.....	101
4.0 Conclusions and Policy Recommendations.....	108
References.....	109

CHAPTER FIVE	118
5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	118
5.1 Summary of Major Results and Conclusions	118
5.1.1 Opportunities and constraints of large-scale agricultural investments	118
5.1.2 Livelihood outcomes among households participating in large-scale agricultural investments	118
5.1.3 Determinants of households participation in the out-grower scheme and investor farm employment	119
5.1.4 Determinants of households livelihood outcomes	120
5.1.5 Summary of theoretical results	121
5.2 Recommendations.....	122
5.2.1 Addressing the constraints of large-scale agricultural investments for participating households	122
5.2.2 Increasing participation of FHHs in the out-grower scheme.....	123
5.2.3 Addressing livelihood outcomes disparities between MHHs and FHHs.....	123
5.2.4 Improving household livelihood outcomes	124
5.3 Contribution of the study to the Body of Knowledge.....	125
5.4 Suggested Areas for Further Research	125
APPENDICES.....	127

LIST OF TABLES

Table 2.1: Sample households from selected villages	40
Table 2.2: Opportunities of out-grower scheme by household headship	42
Table 2.3: Constraints to Out-grower Scheme by household headship.....	43
Table 2.4: Constraints of investor farm employment by household headship	45
Table 2.5: Livelihood outcomes among MHHs and FHHs.....	46
Table 2.6: Livelihood outcomes among out-growers, investor farm workers and non- participants	47
Table 2.7: Multiple comparisons for livelihood outcomes among out- grower, investor farm workers and non-participants	48
Table 2.8: Livelihood outcomes across villages.....	49
Table 3.1: Households’ Socio-economic Characteristics	65
Table 3.2: Households’ Socio-economic Characteristics.....	67
Table 3.3: Socio-Economic factors influencing household participation in out-growers scheme.....	68
Table 3.4: Socio-Economic factors influencing household participation in investor- farm employment.....	73
Table 4.1: Information on FGDs and Participants involved.....	93
Table 4.2: Sample Households from selected Villages	95
Table 4.3: Variables entered in the model	97
Table 4.4: Households’ socio-economic characteristics.....	99
Table 4.5: Households’ socio-economic characteristics.....	101
Table 4.6: Factors influencing household livelihood outcome.....	102

LIST OF FIGURES

Figure 1.1: Relationship between household socio-economic characteristics,
large – scale agricultural investments and livelihood outcomes 20

LIST OF APPENDICES

Appendix 1: A copy of household questionnaire used in the research128

Appendix 2: A copy of Focus Group Discussion Guide...**Error! Bookmark not defined.**

Appendix 3: A copy of key Informant Interview Guide.**Error! Bookmark not defined.**

Appendix 4: Definition of variables used in the binary logistic regression model**Error! Bookmark not defined.**

Appendix 5: Information on FGDs and participants involved**Error! Bookmark not defined.**

Appendix 6: Formula used for determination of sample size.....**Error! Bookmark not defined.**

Appendix 7: Formula for proportional sub- sample size for villages.....142

Appendix 8: Testing assumptions of multiple linear regression model.....142

Appendix 9: Map of Kilombero District showing the location of study
villages and the two large-scale agricultural investments involved
in the study.....144

LIST OF ABBREVIATIONS AND ACRONYMS

ADBI	Asian Development Bank Institute
AGRODEP	African Growth and Development Policy
AMV	Asset Monetary Value
ANOVA	Analysis of Variance
APRA	Agricultural Policy Research in Africa
ASDP	Agriculture Sector Development Programme
BEFS	Bioenergy and Food Security
BRN	Big Results Now
DAICO	District Agriculture, Irrigation and Cooperative Officer
DFID	Department for International Development
DIIS	Danish Institute for International Studies
DOI	Digital Object Identifier
FAC	Future Agriculture Consortium
FAO	Food and Agriculture Organization of the United Nations
FGDs	Focus Group Discussions
FHHs	Female Headed Households
FPE	Feminist Political Economy
HI	Household Income
IAPRI	Indaba Agricultural Policy Research Institute
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IIED	International Institute for Environment and Development
IITA	International Institute of Tropical Agriculture

ILO	International Labour Organization
ILRI	International Livestock Research Institute
KIIs	A Key Informant Interviews
KPL	Kilombero Plantation Limited
KSCL	Kilombero Sugar Company Limited
LACA	Land and Agriculture Commercialization in Africa
Ln	Natural Logarithm
LO	Livelihood Outcomes
LSAIs	Large-Scale Agricultural Investments
MHHs	Male Headed Households
NCPI	National Consumer Price Index
NSGRP	National Strategy for Growth and Reduction of Poverty
PLAAS	Institute of Poverty and Land and Agrarian Studies
REPOA	Research on Poverty Alleviation
RUBADA	Rufiji Basin Development Authority
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SBT	Sugar Board of Tanzania
SDG	Sustainable Development Goal
SLF	Sustainable Livelihood Framework
SPSS	Statistical Package for Social Sciences
SRI	System of Rice Intensification
SSA	Sub-Saharan Africa
SUGECO	Sokoine University of Agriculture Graduate Entrepreneurs Cooperative
TDV	Tanzania Development Vision
TIC	Tanzania Investment Centre

TLTPP	Tanzania Long Term Perspective Plan
TNC'S	Transnational Companies
TZS	Tanzania Shillings
UNCTAD	United Nations Conference on Trade and Development
URT	United Republic of Tanzania
VEO	Village Executive Officer
WEF	World Economic Forum
WEO	Ward Executive Officer
WIDER	World Institute for Development Economic Research

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Problem

1.1.1 Large-scale agricultural investments: global and regional debates

Large-scale agricultural investments have been promoted over the last 10 years as one of the key strategies to rural development in developing countries (Barret, 2012). The concept of large-scale agricultural investment is defined differently by different authors. For instance, FAO (2012) defines the concept as the purchase of land and user rights through lease or concessions, whether for a short period or for a long term. Other scholarly literature including (Cotula, 2012), defines the term as the purchase or lease of vast tracts of land by wealthier, food-insecure nations and private investors from mostly poor, developing countries in order to produce food crops for export. This study conceptualizes large-scale agricultural investments as a process whereby foreign governments, local and foreign companies are leased tracts of arable land for large scale agriculture. These investments have, since 2008, been gaining public attention although in Africa, it is not a new phenomenon (Baglioni and Gibbon 2013; World Bank, 2017). During the colonial era, European countries set up large plantations in Africa, Asia and Latin America for cash crops production (UNCTAD, 2015).

The scale of the recent increase in large-scale agricultural investments is trend-breaking (Byerlee, 2014) and distinguishes this wave from the previous mode of investment (Borras *et al.*, 2011) and this is what motivated the attention of the researchers in the area. The reasons for the current increase in the trend of large-scale agricultural investments in developing countries include an increase in grain prices in 2007/08 (Deininger *et al.*, 2011; Rahmato, 2011), fear among some food-importing countries for not being able to

access sufficient quantities of food for their citizens (Matondi *et al.*, 2011), an increase of the use of biofuels (Olanya, 2012), the growth of carbon markets in response to climate change (Benjaminsen and Bryceson, 2012) and the food-energy-climate crisis (Borras and Franco, 2012). The World Bank has estimated that between 2008 and 2009, nearly 203 investors expressed an interest in 56.6 million ha globally, of which 39.7 million ha were located in Africa (Schoneveld, 2011). In addition, currently there is 20 million hectares envisioned land deals in Africa (Anseeuw *et al.*, 2013).

A review of literature suggests that the effects of large-scale agricultural investments on household livelihood outcomes is ambiguous and brings conflicting views: the proponents of large-scale agricultural investments including different organizations, researchers and activists claim that the phenomenon improves household livelihood outcome. For instance, according to the World Bank (2017), large-scale agricultural investments will result in a win-win situation for both investors and hosting countries, provided that the investments are well managed. The argument is based on the assumption that large-tracts of idle land that can be used for agricultural investments are available globally and offer potentials for agricultural growth among the recipient countries (Shete and Rutten, 2015). According to Borras *et al.* (2013), this view has been used to facilitate acquisition of large tracks of land by foreign investors in developing countries. As Baumgartner *et al.* (2015) observe, in Ethiopia, large-scale agricultural investments have had significant positive influence on household livelihood outcomes. This is due to the fact that, these investments provide an opportunity of developing a successful commercial culture among smallholder farmers (Barret, 2012). Households were reported to have participated in large-scale agricultural investments through out-grower schemes and investor farm employment. Households who were involved in out-grower schemes in which smallholder farmers produce cash crops on their own land, as out-growers on contract with agro-processing

companies, are reported to have benefitted most from these large-scale agricultural investments (Matenga, 2014; Herrmann, 2017) due to opportunities such as access to agricultural inputs, credit or technical assistance, increased income and assured market for their produce (Schupbach, 2014).

The critics of large-scale agricultural investments suggest that while large-scale agricultural investments promise many benefits in many cases, recent studies (Waswa *et al.*, 2012; Oya, 2012) argue that households participating in large-scale agricultural investments have realized limited benefits and have negatively been affected by investments including displacement of people and land alienation without adequate compensation, loss of livelihood and resources base conflicts, erosion of traditional land rights and adverse short and long-term impacts on the environment (Cotula *et al.*, 2009; Deininger, 2011; Kugelman and Levenstein, 2012). De Schutter (2011) warns that although large-scale agricultural investments may be well managed, it has high opportunity cost and less poverty-reducing effects compared to situations when the land is put to an alternative use by the local farming communities. The phenomenon is also reported to have contributed to the widening household income inequalities in Sub-Saharan Africa (Rocca, 2016) and have negatively affected household livelihood outcomes (Matenga and Hichaambwa, 2017; Nolte and Ostermeier, 2017). Household participation in large-scale agricultural investments via sugarcane out-grower scheme is reported to have low livelihood outcomes due to constraints that they face in the process of participating in the out-grower schemes (Mwambi *et al.*, 2016; Wendimu *et al.*, 2016; Ripley, 2017). These constraints 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 (Glover and Kusterer, 1990). In addition, households participating in investor

farm employment are also reported to derive low livelihood outcomes due to seasonal low wages, poor working conditions, payment deductions and lack of transparency in wage systems (Hall *et al.*, 2017; Matenga and Hichaambwa, 2017) and these, in turn, affect household livelihood outcomes.

The effects of large-scale agricultural investments are gendered (Smalley, 2013; FAO, 2012). For example, household participation in out-growers scheme tend to subordinate Female Headed Households (FHHs) as they have weak property rights and limited access to land compared to Male Headed Households (MHHs) and thus preventing the former from participating in contractual arrangements (Hall and Osorio, 2014). In addition, women can experience an increase in workload that limits their chances to engage in large-scale agricultural investments compared to their husbands (Locher and Sulle, 2013). Studies in Sub-Saharan Africa show gender differential effect of large-scale agricultural investments. Most empirical evidence suggests that women are losing out from large-scale agricultural investments (FAO, 2012; UNCTAD, 2015). A study by Hall *et al.* (2015) in Zambia has indicated that men were contract holders in sugarcane out-grower scheme and sugar dividends were received by men, while women were involved in the production of food crops for home consumption. The study has also shown that most of employment opportunities under large-scale agricultural investments were skewed to men. These studies therefore have highlighted the need for gendered studies in order to capture gender differentiated constraints and opportunities of large-scale agricultural investments (Locher and Sulle, 2013; Dancer and Sulle, 2015). According to the World Bank (2017), the effects of large-scale agricultural investments depend not only on geographical location but also on business model, crop, and gender of participating households. The prevailing on going debates on the effects of large-scale agricultural investments imply that generalization can be difficult; therefore, studies on household headship and geographical

locations are critical to be able to advise MHHs and FHHs participating in large-scale agricultural investments.

1.1.2 Large-scale agricultural investments in Tanzania

Large-scale agricultural investments have fuelled considerable debates throughout SSA (Gibbon, 2011). Tanzania is not left behind in this surge of the current rush for large-scale agricultural investments. The nation has had a long tradition of such investments that started during the colonial era and in the early post-independence, but were suspended during the socialist times. Prior to independence, large-scale foreign estates that produced export crops were strongly promoted by the Government of Tanganyika as was the case elsewhere, leaving small scale farmers with little support (Gibbon, 2011). Yet, smallholder cash-crop production flourished in some regions (Mrema and Ndikumana, 2013) and received widespread state support after independence through cooperative development (Maghimbi, 2010) or out-grower schemes linked to large-scale agricultural investments (World, Bank, 1994 as cited by Herrmann, 2017). In the 1990s, policies shifted again to promoting large-scale agricultural investments as an engine for agricultural growth (Herrmann, 2017). Since the mid-2000s, Tanzania has experienced a rapid increase in proposals for large-scale agricultural investments making the nation one of the favourite destinations for large-scale agricultural investments. Tanzania is so far one of the top three to ten destinations of the investments in Sub-Saharan Africa (SSA) (Anseeuw *et al.*, 2013; Schoneveld, 2014).

The increase in the demand for land for large-scale agricultural investments has been fuelled by the claim that the country possesses a considerable amount of land that is under-utilized (Deininger and Byerlee, 2012; IFAD, 2014) and has a great potential for higher agricultural productivity. Many of the earlier Governments owned farms have been

privatized in the last 10 to 15 year and the Tanzania Investment Centre (TIC) was established in 1997 as a one-stop-shop for foreign (and national) investors, facilitating all the procedures with the government agencies for the land acquisition (long term lease). The Southern Agricultural Growth Corridor of Tanzania (SAGCOT) is an established public private partnership, with the aim of transforming agriculture in the country's southern corridor to enhance food security, ensure improved livelihood for smallholder farming communities in a sustainable manner. SAGCOT was initiated as a public-private-partnership at the World Economic Forum (WEF) Africa summit 2010 with a strong focus on agro-industrial development. The blueprint document (SAGCOT, 2011) shows that about 350 000 ha are expected to be developed under large scale farming, with smallholders being linked to these as contract farmers (nucleus/out-grower model) in six clusters namely Sumbawanga, Mbarali, Ihemi, Rufiji, Ludewa and Kilombero. The Big Results Now (BRN) policy initiative which was launched by the Tanzanian Presidency in 2013 to fast-track certain sectoral initiatives through a strong results-based management system, has focused on Large-scale Agricultural Investments (LSAIs) as one of its three agricultural chapters and declared to implement 25 large-scale Agricultural Investments (LSAIs) within the next 3 years from 2011 (Mwimo *et al.*, 2016).

Other policy and strategic initiatives aimed at promoting large-scale agricultural investments in the country include: Agricultural Sector Development Strategy (ASD, 2003), National Agriculture Policy (2013); Tanzania Development Vision (TDV) 2025, National Strategy for Growth and Reduction of Poverty (NSGRP) commonly known as "MKUKUTA" in Kiswahili, Tanzania long Term Perspective Plan (TLTPP) 2011/12-2025-2026 and Tanzania Five Years Development Plan 2011-2015/16 and 2016/17-2020/21. The key message from these policies and strategies on promoting large-scale agricultural investments include: formulation and enforcement of Tanzania contract

farming legal framework, increasing agricultural productivity and strengthening farmers organizations as well as transforming Tanzania to a middle income country through transformation of agriculture from subsistence farming towards commercialization and modernization (Mwimo *et al.*, 2016).

The Kilombero Valley is one of the destinations of large-scale agricultural investments in Tanzania. For example over the past ten years, eight foreign companies have invested in the valley, and it is estimated that 110 586 ha of land have been acquired by the foreign companies (Locher and Sulle, 2013). There are many investments in the Kilombero Valley which are claimed to have strong negative development effects (Tandon, 2010; Benjaminsen and Bryceson, 2012; Action Aid, 2015 and Twomey *et al.*, 2015). The valley has also been identified as a priority cluster for investments under SAGCOT (Sulle, 2017).

The two investments under this study, namely Kilombero Sugar Company Limited (KSCL) and Kilombero Plantation Limited (KPL) have a long history. KPL began as a Tanzania-North Korean joint venture in 1986 and was liquidated in 1993 (Herrmann, 2017). In 2008, a joint venture between the British Company Agrica and Rufiji Basin Agricultural Development Authority (RUBADA), a Tanzanian Parastatal organization, which was mandated to promote agricultural investments in Rufiji Basin, was established. Agrica purchased 5800 ha Government property and established an industrial rice mill, warehouses and cleaning and drying facilities (Benjaminsen and Bryceson, 2012). KPL is in the process of establishing a contract farming scheme with 5000 smallholder rice farmers through a System of Rice Intensification (SRI). KSCL, which is the largest sugar company contributing to about 45 % of the total sugar produced in the country, was established in 1961 as a joint venture financed by the international Finance Corporation, the Commonwealth Development Corporation, Standard Bank and two Dutch

development finance agencies (Sulle, 2017). The Company was nationalized during the Arusha Declaration in 1967. As a result of Tanzania implementing of structural adjustment programmes in the 1980s and 1990s, the company was again privatized in 1998 (Waized *et al.*, 2013). The KSCL under the out-grower scheme has been supported by the Government of Tanzania, donor agencies and international financial institutions.

Despite the growing role of large-scale agricultural investments and Tanzania Government's efforts of promoting these investments, the investments have raised concerns about the exclusion of vulnerable groups including poor households and women (Matenga 2016; Hakizimana *et al.*, 2017; Matenga and Hichaambwa, 2017). Gendered outcomes of large-scale agricultural investments are limited (Behrman, 2012; Cotula *et al.*, 2015). Many studies have a limited focus on interrogating the effects of large-scale agricultural investments on MHHs and FHHs of varying socio-economic backgrounds (Doss *et al.*, 2014). It is argued that with large-scale agricultural investments, smallholder farming households are increasingly being marginalized especially female-headed households and youth members as they are involved in, or excluded from these investments in striking different ways (Locher and Sulle, 2013). Also, the outcomes of large-scale agricultural investments are likely to be socially differentiated across gender, ethnic groups, age cohorts, and income brackets (Cotula and Leonard, 2009). While research has so far focused on the effects of large-scale agricultural investments on household livelihood outcomes (Dancer and Sulle, 2015; Herrmann, 2017) and most existing studies that have addressed gender are skewed on women (Rocca, 2016), which leave other gender variables such as age and marital status less explored. A gendered study is needed to understand how large-scale agricultural investments affect MHHs and FHHs livelihood outcomes in Kilombero valley. This is due to the fact that the effects of large-scale agricultural investments on household livelihood outcomes are differentiated

by household headship and other social group dynamics and characteristics (Newsham *et al.*, 2018).

It is crucial to understand the influence of large-scale agricultural investments on livelihood outcomes differentiated by household headship and other socio-economic characteristics for those households involved in large-scale agricultural investments through out-grower scheme and investor farm wage employment. Understanding these varying interests and addressing the associated constraints of large-scale agricultural investments among MHHs and FHHs will help in informing policies for enhancing positive outcomes and reducing negatives ones. This study contributes to some of these knowledge gaps.

1.2 Statement of the Problem

Large-scale agricultural investment is one of the rural development strategies which are promoted to address the production and marketing of agricultural commodities in developing countries (Oya, 2012). In line with this strategy, Tanzania's Government has been inviting investors to invest in the agricultural sector. The results of these initiatives have been an influx of investors both foreign and local in different parts of the country including Kilombero valley. The influx of large-scale agricultural investments is based on the argument that these investments have high potential for improving household livelihood outcomes (Mombo *et al.*, 2011). However, the level of livelihood outcomes in the Kilombero valley is low (Ellis and Mdoe, 2003; Machimu, 2017). The households that have been engaged in sugarcane production have for a long time experienced low capacity of the factory to crush their sugarcane, which leave most of the sugarcane produced by smallholder out-growers un-harvested (Sulle, 2017). Tanzania potential sugarcane yields is 120 tons/ha per year, but the average yield among sugarcane out-growers in Kilombero

Valley is 12 tons per hectare (Baarn, 2012 as cited by Machimu, 2017) which is lower than the overall average in the valley (50 tons/ha) (Amrouk *et al.*, 2013).

The low level of livelihood outcomes is probably caused by, among other things, low factory capacity, households participating in out-grower scheme experiencing low sugarcane sucrose level, low sugarcane price, high deductions and delay in picking of sugarcane that leaves household sugarcane un-harvested. Also, households participating in investor farm wage employment are constrained by low payments, poor condition of work and seasonality nature of work which probably partly contributes to low livelihood outcomes. However, whether any of these factors really holds true and the extent to which they impact on MHHs and FHHs livelihood outcomes is not known.

Some studies have assessed the effect of large-scale agricultural investments on household livelihood outcomes, but their analysis do not empirically take on board the gender dimension of the effects of large-scale agricultural investments (Bergius *et al.*, 2017; Herrmann, 2017; Machimu, 2017). Consideration of gender issues will allow researcher to capture similarities and differences between MHHs and FHHs in terms of opportunities and constraints of large-scale agricultural investments and livelihood outcomes. Other studies, for example Tandon (2010) and Sulle (2017) have incorporated gender in their analysis. Nonetheless, their studies were skewed to women and ignored other gender variables such as age, household headship, and marital status thus leaving gendered effect of large-scale agricultural investments less understood. Similarly, the linkages between opportunities and constraints of large-scale agricultural investments and household socio-economic characteristics have not been explored sufficiently. Also, the determinants of households' participation in large-scale agricultural investments via out-grower scheme and investor farm employment and their effect on MHHs and FHHs livelihood outcomes

are not clearly understood. In addition, the determinants of household's livelihood outcomes in the context of large-scale agricultural investments are not well known. This study assesses the determinants of household participation in the out-grower scheme and investor farm wage employment in Kilombero valley and whether or not the participation contributes to the improvement of livelihood outcomes of their households

1.3 Justification for the Study

The study was important due to the fact that the findings of the study will contribute to the government's effort in improving livelihood of MHHs and FHHs participating in out-grower scheme and investor farm wage employment and address constraints that hinder them from deriving benefits from large-scale agricultural investments. The Kilombero Valley requires attention because it is among the five clusters of large-scale agricultural investments initiated by SAGCOT in Tanzania, and that livelihoods of the majority of the people in the area depend on rice and sugarcane production (Smalley *et al.*, 2014). This study takes a gender dimension in order to explore how MHHs and FHHs are benefiting from participating in large scale agricultural investments.

Therefore, the findings from this study would contribute to new knowledge on effects of large-scale agricultural investments on household livelihood outcomes. This information is crucial in informing actors involved in promoting livelihood outcomes through large-scale agricultural investments at local and national levels to manage constraints associated with large-scale agricultural investments. The research is crucial and timely because it is done during the era when Tanzania is attracting large scale agricultural investors through different policy strategies including making Tanzania a middle income country and with industrial led economic growth. There is a need to inform policy makers on how large-scale agricultural investments affects MHHs and FHHs livelihood outcomes, in order to

come up with strategies to overcome factors hindering rural communities chances to enjoy benefits derived by presence of large-scale agricultural investments in the country. Findings on opportunities and constraints of large-scale agriculture investments for MHHs and FHHs are among the basics for the attainment of the fifth Sustainable Development Goal focusing on achieving gender equality and empower all women and girls by 2030. Findings on livelihood outcomes provide information that will contribute to the efforts of achieving the first target of Tanzania Development Vision 2025 focusing on high quality of livelihood among households.

1.4 Objectives

1.4.1 Overall objective

The overall objective of the study was to examine socio-economic determinants of household participation in large-scale agricultural investments and its influence on household livelihood outcomes.

1.4.2 Specific objectives

The study on which this thesis is based specifically intends to;

- i. Analyse the association between opportunities and constraints of out-growers schemes and investor farm employment and household headship.
- ii. Examine socio-economic factors influencing household engagement in out-growers scheme and investors farm employment.
- iii. Compare livelihood outcomes among households participating in out-grower scheme, non-participant and investor farm employment.
- iv. Determine the socio-economic factors and large-scale agricultural investments factors influencing household livelihood outcomes.

1.5 Research Questions and Hypothesis

This study was guided by research questions and hypotheses since it used a combination of qualitative and quantitative approaches to collect and analyse data. According to Creswell *et al.*(2003), when researcher adopt mixed methods, both research questions and hypotheses are required in order to guide qualitative and quantitative data collection. In that regard, the research questions guided qualitative approach while hypotheses were applied for inferential analysis of quantitative data.

1.5.1 Research questions

The study was guided by the following research questions:

- i. How do constraints of out-growers scheme differ by household headship of participating households?
- ii. How do opportunities of out-growers scheme differ by household headship of participating households?
- iii. How is household headship associated with the constraints of investor farm employment?
- iv. What are the household livelihood outcomes among out-growers, investor farm workers, non-participants and MHH and FHHs?
- v. How do households engaged in out-grower scheme and investor farm employments are affected by large-scale agricultural investments differ in terms of livelihood outcomes?

1.5.2 Research hypotheses

- i. There is no association between out-growers' constraints and household headship.
- ii. There is no association between out-growers' opportunities and household headship

- iii. There is no association between investor farm employment constraints and household headship.
- iv. Household participation in out-grower scheme is not influenced by their socio-economic characteristics.
- v. Household participation in investor farm employment is not influenced by their socio-economic characteristics.
- vi. Out-growers, non-participants and investor farm workers do not differ in terms of livelihood outcomes.
- vii. Male-headed households and Female-headed households do not differ in terms of livelihood outcomes.
- viii. Household socio-economic characteristics and large-scale investments factors do not influence their livelihood outcomes.

1.6 Theoretical Framework

1.6.1 Sustainable livelihood framework (SLF)

The SLF improves understanding of the livelihood of the poor as it organizes the factors that constrain or enhance livelihood opportunities and show how they relate (Serrat, 2010). Various organisations have used SLF; these include: Care International, Department for International Development (DFID) and United Nations Development Programme (UNDP). The three agencies have used the SLF differently. The UNDP and Care International have used it to enhance planning of development projects, while DFID has used the framework for the analysis of poverty. In the context of this study, the SLF framework was adopted in order to analyse livelihood outcomes among households participating in large-scale agricultural investments. The SLF is built around the assumption that improvement of livelihood outcomes of poor people can be through understanding the five principal categories of livelihood assets namely physical, human,

financial, natural and social and their ability to put these assets to productive use (DFID, 2000). In this context, achievements/livelihood outcomes depend on the use of assets shaped by the prevailing social organization and processes (out-grower scheme). This study used SLF to capture household assets and socio-economic characteristics that affect livelihood outcomes which are defined in this study as the household's ability to increase income and increase asset stocks. Principally, large-scale agricultural investments are expected to have an impact on the communities' livelihoods by creating options for the household to improve their livelihood. The selection of the approach is based on the fact that it allows capturing aspects of rural livelihoods such as assets and activities from which rural livelihoods are derived (Ellis, 2000).

The SLF was thought as very important in this study in understanding important livelihood assets in the context of large-scale agricultural investments that can have an effect on household livelihood outcomes in the study area. The SLF thinking on the factors constraining or enhancing livelihood outcomes guided the study to see the necessity of examining constraints and opportunities of out-grower scheme and investor farm employment among participating households. Consequently, the study assessed the determinants of households participating in the out-grower scheme and investor farm employment in the study area. The assessment was thought to be necessary in giving clear pictures on the factors that enhance or constrain households from participating in out-grower scheme and investor farm employment. Likewise, the SLF was considered important in helping to understand the socio-economic characteristics and large-scale agricultural investments factors that influence households' livelihood outcomes. Though the SLF offers an insight regarding understanding the socio-demographic characteristics and five categories of livelihood assets that have some influence on household livelihood outcomes and their participation in out-grower scheme and investor farm employment, it

does not clearly provide a systematic framework of analysing how MHHs and FHHs differ in terms of constraints and opportunities they enjoy due to their participation in out-grower scheme and investor farm employment. The SLF also does not allow the comparison of livelihood outcomes among MHHs and FHHs. This can be done through household headship disaggregation of broad based livelihoods data or through undertaking a specific gender analysis.

1.6.2 Feminist political economy theory

Feminist Political Economy (FPE) researchers established feminist thinking since the 1970's due to gender inequalities between men and women in the mid-twentieth century when Boserup challenged ideas about rural livelihoods and economic development by insisting on the importance of incorporating gender in rural development (Behrman *et al.*, 2012). The FPE thinking allows gender disaggregated data; this is in contrast to SLF, which ignores gender thinking in the analysis. In addition, FPE thinking views MHHs and FHHs differently in terms of opportunities, capabilities and constraints in driving benefits from large-scale agricultural investments. Based on the FPE thinking, large-scale agricultural investments may affect MHHs and FHHs differently.

The proponents of FPE thinking, including Riley (2008) and Doss *et al.* (2014), posit that livelihoods within agrarian political economy are gendered in their organisation, process, and their outcomes. Therefore, there is a need to consider gender when analysing the effect of large-scale agricultural investments on household livelihood outcomes. According to FPE thinking, gender inequalities, as a result of large-scale agricultural investments, is rooted in gender differences in the ability to participate in the out-grower scheme and investor farm employment due to difference in opportunities, capabilities, constraints, and socio-economic characteristics.

In applying the FPE thinking, the study examined opportunities and constraints of out-grower scheme and investor farm employment enjoyed by participating MHHs and FHHs and analyse livelihood outcomes among MHHs and FHHs. This was done by disaggregating opportunities, constraints, and livelihood outcomes by household headship. Gender variables such as age, household headship, and marital status were also included in assessing the determinants of household participation in the out-grower scheme and investor farm employment. This was done on the assumption that, men and women differ in terms of opportunities, constraints and capabilities; there might be also differences in their opportunities in participating in the out-grower scheme and investor farm employment. Although FPE lacks sufficient attention to socio-cultural issues in the analysis, the study adopted the theory since the communities involved in the study were of similar cultural background.

1.7 Conceptual Framework

The conceptual framework of this thesis, which is presented in Figure 1.1, is informed by theoretical and empirical literature. This framework establishes linkages between household socio-demographic characteristics, livelihood assets, livelihood strategies and household participation in the out-grower scheme and investor farm employment (independent variables) and household livelihood outcomes which is the dependent variable. According to SLF thinking, household socio-economic characteristics, livelihood assets, livelihood strategies and household participation in the out-grower scheme and investor farm employment, as shown in Figure 1.1, are important factors in bringing changes in the household livelihood outcomes. The study hypothesized that household socio-economic characteristics and household participation in the out-grower scheme and investor farm employment have an impact on livelihood outcomes. The impact can be positive when they increase the ability of the household to improve their livelihood

outcomes, or can be negative when they reduce the ability of the households to improve their livelihood outcomes. According to Otsuka and Yamano (2006), the main factors that influence household livelihood outcomes include household size, age and gender of the household head, education, social capital, asset endowment, and occupation of the household head. Household headed by males were expected to be better in terms of livelihood outcomes as they have higher chances of participating in the out-grower scheme and investor farm employment. Household participation in the out-grower scheme improves their livelihood outcomes (Baumgartner *et al.*, 2015) while household's participation in the investor farm employment reduces household livelihood outcomes due to low wages and seasonality nature of the work (Hall *et al.*, 2017).

Another key argument in this thesis is that household socio-economic characteristics and livelihood assets can also have positive or negative influence on the chances of the households to participate in the out-grower scheme and investor farm employment. Feminist Political Economy thinking posits that a large-scale agricultural investment is gendered with MHHs deriving more benefits compared to FHHs (Doss *et al.*, 2014). According to Dancer and Sulle (2015), participation in the out-grower scheme and investor farm employment favours the MHHs more than it does to FHHs as the two differ in terms of socio-economic characteristics such as education, land size, participation in social groups and income and asset endowment. The households with more education, more assets, more income, close to investors, and with large household size and married household heads are more likely to participate in the out-grower scheme (Herrmann, 2017).

The study also argues that MHHs and FHHs participating in the out-grower scheme and investor farm employment are affected differently in terms of livelihood outcomes due to

differences in opportunities, constraints, motivation and capabilities (Schupbach, 2014). According to Osabuohien *et al.* (2016), participation in the out-grower scheme and investor farm employment has a negative effect on the welfare of FHHs which are located in the communities with large-scale agricultural investments. In addition, due to the presence of large-scale agricultural investments, households engage in different livelihood strategies that influence their livelihood outcomes in terms of income and asset ownership.

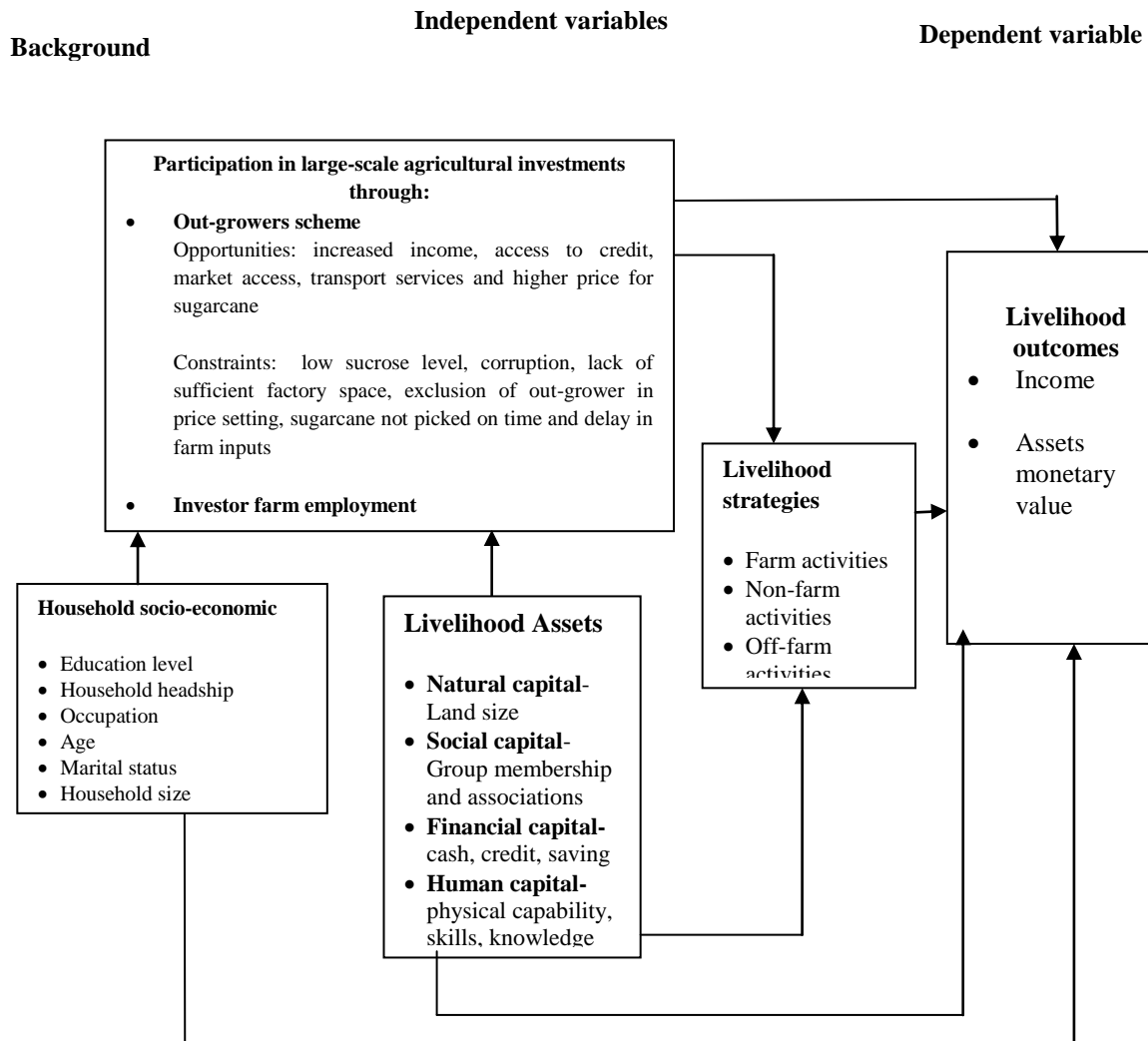


Figure 1.1: Relationship between household socio-economic characteristics, large – scale agricultural investments and livelihood outcomes

Source: Adapted from DFID, 2000

1.8 Organization of the Thesis

The whole thesis is organised in five chapters and begins by presenting the introduction in Chapter One. This sets background information to the thesis. Chapter Two presents manuscript number one that combines objectives one and three which deal with comparison of livelihood outcomes among households participating in the out-grower scheme and investor farm employment, constraints and opportunities of out-grower schemes and investor farm employment. This is followed by Chapter Three, which focuses on the determinants of household’s participation in the out-grower scheme and

investor farm employment. Chapter Four presents manuscript number three, which focus on the socio-economic characteristics and large scale agricultural investment factors influencing households' livelihood outcomes. Chapter Five presents a summary of the results and discussion from all the manuscripts and finally draws conclusions and recommendations.

References

- Action Aid (2015). Contract Farming and Out Growers Schemes. An Appropriate Development Model to Tackle Poverty and Hunger Policy Discussion Paper. Action Aid, Dar es Salaam, Tanzania. 12pp.
- Amrouk, E., Rakotoarisoa, A.M. and Chang, K. (2013). *Structural Changes in the Sugarcane Market and Implications for Sugarcane Smallholders in Developing Countries: Countries Case Studies for Ethiopia and United Republic of Tanzania*. Trade and Markets Division, Food and Agriculture Organization, United States of America. 52pp.
- Anseeuw, W., Lay, J., Messerli, P., Meserli, P., Giger, M. and Taylor, M. (2013). Creating a public tool to assess and promote transparency in global land deals: the experience of the land matrix. *Journal of Peasant Studies* 40: 521–530.
- Baglioni, E. and Gibbon, P. (2013). Land grabbing, large-and small-scale farming: what can evidence and policy from 20th century Africa contribute to the debate?. *Third World Quarterly* 34: 1558-1581.
- Baumgartner, P., von Braun, J., Abebaw, D. and Müller, M. (2015). Impacts of large-scale land investments on income, prices, and employment: empirical analyses in Ethiopia. *World Development* 72: 175–190.

- Barrett, C. B., Bachke, M. E., Bellemare, M. F., Michelso, H. C., Narayanan, S. and Walker, T. F. (2012). Smallholder participation in contract farming: comparative evidence from five countries. *World development* 40(4): 715–730.
- Benjaminsen, T.A. and Bryceson, I. (2012). Conservation, green/blue grabbing and accumulation by dispossession in Tanzania. *Peasant Studies* 39 (2): 335-355.
- Behrman, J., Meinzen-Dick, R. and Quisumbing, A. (2012). The gender implications of large scale land deals. *Peasant Studies* 39: 49 – 79.
- Borras, Jr, S. M., Hall, R., Scoones, I., White, B. and Wolford, W. (2011). Towards a better understanding of global land grabbing: An Editorial Introduction. *Peasant Studies* 38(2): 209 – 216.
- Borras, S. and Franco, J.C. (2012). global land grabbing and trajectories of agrarian change: a preliminary analysis. *Agrarian change* 12(2):34-59.
- Borras, S., Franco, J.C. and Wang, C. (2013). The challenges of governance land grabbing: changing international agricultural context and competing political views and strategies. *Globalization* 10(1): 161-179.
- Byerlee, D. (2014). The fall and rise again of plantations in tropical Asia: history repeated. *Land Change Policy* 3: 574–597.
- Cotula, L., Vermeulen, S., Leornad, R. and Keeley, J. (2009). *Land grab or development opportunity? Agricultural investment and international land deals in Africa*. International Fund for Agriculture Development, London. 249pp.

- Cotula, L. (2012). The international political economy of the global land rush: a critical appraisal of trends, scale, geography and drivers. *Peasant Studies* 39 (4): 649–680.
- Cotula, L., Oya, C., Codjo, E. A., Eid, A., KakrabaAmpeh, M., Keeley, J., Kidewa, A.L., Makwarimba, M., Seide, W.M., Nasha, W.O., Asare, R. O. and Rizzo, M. (2015). Testing claims about large land deals in Africa: Findings from a multi-country study. *Third World Quarterly* 50 (7): 903–925.
- Creswell, J. W., Plano Clark, V. L., Gutmann, M. and Hanson, W. (2003). Advanced mixed methods research designs. In: A. Tashakkori and C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage. pp. 209-240.
- Dancer, H. and Sulle, E. (2015). *Gender Implications of agricultural Commercialization: The case of Sugarcane Production in Kilombero District, Tanzania*, Working paper No. 118. Institute of Poverty and Land and Agrarian Studies, Brighton, UK. 36pp.
- Deininger, K. (2011). Challenges posed by the new wave of farmland investment. *Journal of Peasant Studies*, 38(2): 217–247.
- Deininger, K., Byerlee, D., Lindsay, J., Norton, A., Selod, H., Stickler, M. (2011). *Rising Global Interest in Farmland: Can it Yield Sustainable and Equitable Benefits?*. World Bank, Washington DC. 215pp.

- Deininger, K. and Byerlee, D. (2012). The rise of large farms in land abundant countries: do they have a future? *World Development* 40(4): 701–714.
- De Schutter, O. (2011). How not to think of land-grabbing: Three critiques of large-scale investments in farmland. *Peasant Studies* 38: 249 – 279.
- Doss, C., Summerfield, G. and Tsikata, D. (2014). Land, gender and food security. *Feminist Economics* 20(1): 1 – 23.
- Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics* 52: 289 – 302.
- Ellis, F. and Mdoe, N. (2003). Livelihood and rural poverty reduction in Tanzania. *World Development* 31(8): 1367-1384.
- FAO (2012) Impact of foreign agricultural investments on developing countries: evidence from case studies. Retrieved from [<http://www.fao.org/economic/est/issues/investments>] site visited 14/4/2016.
- Gibbon, P. (2011). Experiences of Plantation and Large-Scale Farming in 20th Century Africa. *DIIS working paper*: 20. [<http://www.diis.dk/sw112603>]. site visited on 26/10/2016.
- Glover, D. and Kusterer, K. (1990). *Small Farmers, Big Business: Contract Farming and Rural Development*. The Macmillan Press, Hampshire, England. 169pp.

- Hakizimana, C., Goldsmith, P., Nunow, A. A., Roba, A.W. and Biashara, J. K. (2017). Land and agricultural commercialisation in Meru County, Kenya: Evidence from three models. *Peasant Studies* 44 (3): 555-573.
- Hall, R. and Osorio, M. (2014). Agricultural Investment, Gender and Land in Africa: Toward Inclusive Equitable and Socially Responsible Investment, PLAAS Conference Report, Cape Town, South Africa. 42pp.
- Hall, R., Edelman, M., Borras, S.M., Scoones, I., White, B. and Wolford, W., (2015). Resistance, acquiescence or incorporation? An introduction to land grabbing and political reactions ‘from below’. *Peasant Studies* 42(4):467-488.
- Hall, R., Scoones, I. and Tsikata, D. (2017). Plantations, out growers and commercial farming in Africa: agricultural commercialization and implications for agrarian change, *Peasant Studies* 44 (3): 515-537.
- Herrmann, R.T. (2017). Large-scale agricultural investments and smallholder welfare: a comparison of wage labour and out grower channels in Tanzania. *World Development* 90: 294-310.
- Hichaambwa, M. and Matenga, C. (2016). Which Large-scale Agricultural Commercialization Models Offer the Best Opportunities for Improved Local Livelihood in Zambia, Indaba Agricultural Policy Research (IAPRI) Policy Brief No. 80. [<http://iapri.org.zm>] site visited on 22/7/2017.

IFAD (2014). Investing in rural people in the United Republic of Tanzania, retrieved from [[http://www.ifad.org/operations/projects/regions/pf/factsheets /tanzania.pdf](http://www.ifad.org/operations/projects/regions/pf/factsheets/tanzania.pdf)] site visited on 17 /12/ 2016.

Kugelman, M. and Levenstein, S. (2012). *Global Farms Race: Land Grabs, Agricultural Investment and the Scramble for Food Security*, Island Press. [<https://islandpress.org/books/global-farms-race>]. site visited on 20/3/2016.

Knapman, C. and Sutz, P. (2015). Reconsidering Approaches to Women's Land Rights in Sub-Saharan Africa International Institute for Environment and Development (IIED) Policy brief. [<http://pubs.iied.org/17150IIED>] site visited on 12/07/2017.

Lanz, K. and Daley, E. (2016). Gender, Land and Agricultural Development in Africa: From Women to Gender. [<https://landportal.info/sites/landportal.info/files>] site visited on 28/5/2017.

Locher, M. and Sulle, E. (2013). *Foreign Land Deals in Tanzania: An update and critical review on the challenges of data production*. The Land Deal Initiatives, Brighton, UK. 47pp.

Machimu, G.M. (2017). Levels of livelihood outcomes among smallholder sugarcane out growers in Morogoro Region, Tanzania. *Journal of Development Research* 7(9): 14912-14916.

Maghimbi, S. (2010). *Cooperatives in Tanzania mainland: Revival and growth*. Coop- AFRICA Working Paper No.14, ILO: Geneva.37pp.

- Matenga, C. (2014) 'Differential gender impacts of Magobbo Smallholder Out grower Sugar Scheme in Mazabuka District, Zambia'. Presentation at the Agricultural Investment, Gender and Land conference, Cape Town, 5–7 March.8pp.
- Matenga, C.R. (2016). Out-growers and livelihood: The case of magobbo smallholder block farming in mazabuka district in Zambia, *Southern African Studies* 43(3): 551-566.
- Matenga, C.R. and Hichaambwa, M. (2017). Impact of land and agricultural commercialization on local livelihoods in Zambia: Evidence from three models, *Peasant Studies* 44(3): 574-593.
- Matondi, P. B., Havnevik, K. and Beyene, A. (2011). Conclusion: land grabbing, smallholder farmers and the meaning of agro-investor-driven agrarian change in Africa. In *Biofuels, land grabbing and food security in Africa* (Edited by Matondi, P.B., Havnevik, K., Beyene, A.) Zed Book, London. pp. 176–195.
- Mombo, F., Speelman, S., van Huylenbroeck, G., Hella, J., Pantaleo, M. and Stein, M. (2011). Ratification of the Ramsar convention and sustainable wetlands management: situation analysis of the Kilombero valley wetlands in Tanzania. *Journal of Agricultural Extension and Rural Development* 3: 153–164.
- Mrema, G. C. and Ndikumana, J. (2013). *Value addition and post-harvest processing in East Africa over the past fifty years and prospects for the future*. Technical Paper for International Symposium on Agriculture: EAC Partner states at 50 years, 5-7 November. 21pp.

- Mwambi, M.M., Oduol, J., Mshenga, P., Saidi, M. (2016). "Does contract farming improve smallholder income? The case of avocado farmers in Kenya", *Journal of Agribusiness in Developing and Emerging Economies* 6(1): 2-20.
- Mwimo. L., Mbowe, W., Kombe, C., Kibesse, B., Mziya, M., Kazi, M., Mchemba, J., Mashini, S., Mpemba, Z., Lugobi, M., Yabu, N. and Ndunguru, E. (2016). *Contract Farming Schemes in Tanzania: Benefits and Challenges*, Bank of Tanzania (BOT) Working Paper 08. 37pp.
- Newsham, A., Kohnstamm, S., Naess, L. O. and Atela, J. (2018). *Agricultural Commercialization Pathways: Climate Change and Agriculture*, Agricultural Policy Research in Africa (APRA) Working Paper 09, 59pp.
- Nolte, K. and Ostermeier, M. (2017). Labour Market Effects of Large-scale Agricultural Investments: Conceptual Considerations and Estimated Employment Effects. Retrieved from [<http://DOI.10.1016/j.worlddev.2017.05/012>] site visited on 13/8/2017.
- Olanya, D.R. (2012). *From Global Land Grabbing for Biofuels to Acquisitions of African Water for Commercial Agriculture*. Nordiska Afrikainstitutet, Uppsala.41pp.
- Osabuohien, E.S., Herrmann, R., Efobi, U. R., Gitau, C.M.W. (2016). *Female Labour Outcomes and Large-scale Land Investments in Tanzania*, African Growth and Development Policy Modelling Consortium (AGRODEP) Working Paper No.0038, 36pp.

- Otsuka, K. and Yamano, T. (2006). "Introduction to the Special Issue on the Role of non farm income in reduction: Evidence from Asia and East Africa", *Agricultural Economics* 35(3): 393-397.
- Oya, C. (2012). Contract Farming in Sub-Saharan Africa: A survey of approaches, debates and issues. *Journal of Agrarian Change* 12(1): 1–33.
- Rahmato, D. (2011). *Land to Investors: Large-scale Land Transfer in Ethiopia*, Forum for Social Studies, Addis Ababa, Ethiopia. 36pp.
- Riley, M. (2008). A feminist political economic framework. [https://www.coc.org/files/Riley%20-%20FPE_0.pdf] site visited on 30/06/2016.
- Ripley, M. (2017). Improving Market Access for Smallholder Farmers: What Works in Out-grower Schemes-Evidence from Timor-Leste, International Labour Organization (ILO) Issue Brief 1, 5pp.
- Rocca, V. (2014). *The gendered implications of the expansion of commercial sugarcane production: A case study of contract farming in Magobbo, Zambia*. Dissertation for Award of MA Degree at Carleton University, Ottawa, Canada. 122pp.
- Rocca, V. (2016). Gender and Livelihoods in Commercial Sugarcane Production: A Case Study of Contract Farming in Magobbo, Zambia. LACA (Land and Agricultural Commercialization in Africa) Working paper 136. 23pp.

- SAGCOT, (2011). Investment Blueprint. AgDevCo / Procurista. [<http://www.sagcot.com/>] site visited on 21/8/2016.
- Schooneveld, G. (2014). The Geographic and Sectorial Pattern of Large- scale Farmland Investments in Sub-Saharan Africa, in: Food Policy, online. Retrieved from [www.sciencedirect.com/article/pii/S0306919214000475.pdf] site visited on 12/1/2016.
- Schupbach, J.M. (2014). Foreign Direct Investment in Agriculture: The Impact of Out-grower schemes and Large-scale Farm employment on Economic Well-being in Zambia, A thesis of Doctor of Sciences of ETH Zurich, 155pp.
- Serrat, O. (2012). *Marketing in the Public Sector*. Washington, D.C: Asian Development Bank. [<https://digitalcommons.ilr.cornel.edu/inf/144/>.pdf] site visited 20/4/2018.
- Shete, M. and Rutten, M. (2015). Impacts of large-scale farming on local communities' food security and income levels? Empirical evidence from Oromia Region, Ethiopia. *Land Use Policy* 47: 282-292.
- Smalley, R. (2013). Plantations, Contract Farming and Commercial Farming Areas in Africa: A Comparative Review. Working Paper No. 055. Land and Agricultural Commercialization in Africa, Brighton, UK. 72pp.
- Smalley, R., Sulle, E. and Malale, L. (2014). *The Role of the State and Foreign Capital in Agricultural Commercialization in Kilombero District, Tanzania*. Working Paper No. 106. Institute of Poverty and Land and Agrarian Studies, Brighton, UK. 36pp.

Sokchea, A. and Culas, R.J. (2015). Impact of contract farming with farmer organizations on farmer's income: A Case Study of Reasmey Stung Sen Agriculktural Development Cooperative in Cambodia, *Australasian Agribusiness Review* 23 (1): 1-11.

Sulle, E. (2017). Social differentiation and the politics of land: sugar cane outgrowing in Kilombero, Tanzania, *Southern African Studies* 43(3): 517-533.

Tandon, N. (2010). New agribusiness investments mean whole sell-outs for women farmers. *Gender and Development* 18(3): 503-514.

Twomey, H., Schiavoni, C. M. and Mongula, B. (2015): Impacts of Large-scale Agricultural Investments on Small-scale Farmers in the Southern Highlands of Tanzania: A Right to Food Perspective [<https://www.misereor.de/fileadmin/publikationen/study-a-right-to-food-perspective-2015.pdf>] site visited on 21/ 12/ 2016.

United Nations Conference on Trade and Development (UNCTAD). (2015). The Least Developed Countries Report 2015: Transforming Rural Economies. United Nations. [<http://unctad.org/en/pages/PublicationWebflyer.aspx?publication=1393>] site visited on 14/4/2016.

URT (2013). *National Agriculture Policy*, Dar es Salaam. 40pp.

Waized, B., Massimba, J. and Malaki, C. (2013). *Consultancy Services for Collecting Policy Based Evidence for Enhancing Sugar Industry Regulatory Framework of*

Tanzania, Sokoine University of Agriculture Graduate Entrepreneurs Cooperative (SUGECO), Morogoro, Tanzania. 47pp.

Waswa, F., Gwenyi-Onyango, P.J. and Mcharo, M. (2012). Contract sugarcane farming and farmer's income in large victoria basin, Kenya, *Applied Biosciences* 52: 3685-3695.

Wendimu, M.A., Henningsen, A. and Gibbon, P. (2016). Sugarcane out-growers in Ethiopia: "Forced" to Remain Poor? *World Development* 3:84–97.

World Bank (2017). The Impact of Large-scale Agricultural Investments on Local Communities: Updated Voices from the Field. Agricultural Global Practice Discussion Paper 12. Washington DC, USA. 58pp.

CHAPTER TWO

Livelihood Outcomes among Households Participating in Large-scale Agricultural Investments in Kilombero Valley, Tanzania

Elimeleck P. Akyoo, John N. Jeckoniah and Samwel J. Kabote

Department of Development Studies, College of Social Sciences and Humanities, Sokoine University of Agriculture, P. O. Box, 3024, Morogoro, Tanzania.

Corresponding author email: eparmena@yahoo.com or eparmena@gmail.com

Target Journal and Status: International Conference for Planning and Development at IRDP Dodoma, Abstract accepted for conference.

Abstract

Large-scale agricultural investment is an important economic activity which has the potential of improving the livelihoods of Male-Headed Households (MHHs) and Female-Headed Households (FHHs). However, the benefits derived from large-scale agricultural investments have differentials in household headship and agricultural investments models. The study was conducted in Kilombero Valley in Tanzania to assess livelihood outcomes among households engaged in large-scale agricultural investments through out-grower 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 values were used as proxy indicators of wealth status. Qualitative data were analysed by using content analysis while a multiple responses analysis and a Chi-square test, T-test and One-Way Analysis of Variance (ANOVA) were employed for quantitative data analysis. The findings reveal that MHHs

participating in the out-grower scheme had more opportunities than was the case with FHHs ($\chi^2 = 38.44$; $p < 0.05$). The livelihood outcomes between MHHs and FHHs were statistically significant ($p < 0.05$) with MHHs having higher livelihood outcomes. The livelihood outcomes among out-growers, investor farm workers and non-participants were statistically significant ($p < 0.05$) with out-growers recording higher livelihood outcomes. 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 decision making over the income accrued from large-scale agricultural investments. The study recommends to the Local Government Authority and to non-governmental organizations involved in promoting livelihood improvement through large-scale agricultural investments to promote FHHs ownership of resources. This can be done by equitable land distribution to allow more FHHs to access and control productive resources including sugarcane land and address constraints for household participation in the out-grower scheme. Further measures include strengthening of out-growers association through training out-growers on their roles while 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.

Key words: Large-scale agricultural investments, out-growers scheme, investor farm employment, livelihood outcomes, Kilombero Valley.

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 (Schupbach, 2014; Hichaambwa and Matenga, 2016). According to FAO (2012), Large-scale agricultural investment refers to the 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 has significantly increased household livelihood outcomes. These studies include empirical evidence in Ethiopia (Baumgartner *et al.*, 2015); Zambia (Matenga, 2016; Timor (ILO, 2017), Zimbabwe (Mutopo *et al.*, 2015), Mozambique (Knapman and Sutz, 2015), Ghana (Yaro, 2017) and Vietnam (Saigenji, 2010). In addition, households involved in the out-grower schemes in which smallholder farmers produce cash crops on their own land, as out-growers on contract with agro-processing companies, have been more beneficial to most farmers (Matenga, 2014; Sokchea and Culas, 2015; Glover and Jones, 2016; Herrmann, 2017). 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 the widening household income inequalities (Rocca, 2016) and have negatively affected household livelihoods (Matenga and Hichaambwa, 2017; Nolte and Ostermeier, 2017). Out-grower scheme in sugarcane production is reported to have poor contribution to household livelihood outcomes due to multiple reasons (Glover and Jones, 2016; Mwambi *et al.*, 2016; Wendimu *et al.*, 2016; Ripley, 2017). 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 the out-growers and delay in farm inputs from out-grower associations (Glover and Kusterer, 1990; Cai *et al.*, 2008). Households participating in investor farm employment have also been reported to have been 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) and these in turn have affected household livelihood outcomes.

Previous studies show that large-scale agricultural investments affect livelihood of different categories of households. Matenga and Hichaambwa (2017), for instance, argue that large-scale agricultural investments result in heterogeneous effects on different segments of social groups. The argument is based on the fact that large-scale agricultural investments that integrate smallholder farmers in the production of crops lead to more chances of achieving 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) argue 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 not a homogenous group, and in that case, there is also differentiation in terms of how they are affected by 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' 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 which are located in the communities with large-scale agricultural investment. Their findings reveal further that FHHs working in the investor farm employment earned slightly lower agricultural wages than those not working in large-scale agricultural investments.

Despite having a plethora of 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 (Rocca, 2016). 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 (Smalley, 2013; Cotula *et al.*, 2015). Therefore, it is important to have empirical evidence from diverse sources. Such information is useful for policy makers, researchers and development partners especially those engaged in promoting gender equity and bringing about women empowerment. Therefore, this paper provides empirical evidence by analysing the association between opportunities and constraints of out-grower scheme and investor farm employment and household headship and compares livelihood outcomes among MHHs and FHHs as well as among household engaged in the out-grower scheme, investor farm employment and those not participating in the out-grower scheme in Kilombero Valley.

The study from which this paper is based is anchored in the Sustainable Livelihood Framework (SLF) as described by DFID and Feminist Political Economy (FPE). The SLF

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). On the other hand, FPE assumes that livelihood within agrarian political economy are gendered in their organization, processes, and outcomes (Riley, 2008; Doss *et al.*, 2014). The SLF allows us to have a clear sense of the most important assets that a household owns and how these assets are affected by large-scale agricultural investments while FPE was used allow better understanding of the realities of MHHs and FHHs whose lives are impacted across different models of large-scale agricultural investments.

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 had the largest number of out-growers and households working in large-scale agricultural investments in Kilombero Valley. A cross-sectional research design was adopted in order to explain the relationship between variables at one time. The sampling unit was a household involving household head or spouse and exploratory sequential research strategy was adopted and this involved the initial phase of qualitative data collection and analysis which was followed by quantitative data collection and analysis phase. The phase of qualitative data collection involved Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). The use of mixed methods helps to gain deeper, broader understanding of the phenomenon and integration of the results (Courtney, 2017). A total of seven FGDs each of which having participants ranging from six to eight were conducted; these FGDS involved participants who were knowledgeable in the out-grower scheme and investor farm employment. Based on their position and knowledge in relation to the study objectives, fourteen KIIs were purposely selected. These include two out-

grower association administrative secretaries, three Ward Executive Officers (WEO), four Village Executive Officers (VEO), two representatives from KPL and KSCL, one representative from SAGGOT, one representative from Sugar Board of Tanzania and Kilombero District Agricultural, Irrigation and Cooperative Officer (DAICO).

The phase of quantitative data collection involved a household survey whereby sample size of 400 households was used but data were collected from 376 household heads due to incomplete of some questionnaire and none responses. Proportionate stratified sampling using a household village register was applied to determine a sub-sample from each village as shown in Table 2.1. Thereafter, simple random sampling using lottery technique was used to pick respondents from each village.

Table 2.1: 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 using content analysis whereby information pieces were organized into different themes and compared based on the 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 (ANOVA) were used to compare livelihood outcomes

among the households. Before running ANOVA and independent T-tests, a normality test was done using Shapiro-Wilk and data on income and asset monetary value were transformed using natural logarithm. Livelihood outcome was measured by aggregating total household income and household total asset values as adapted from Wendimu (2015) and the following formula was used:

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

Where,

LO = Household livelihood outcome,

Ln = the natural logarithm,

HI = Household income, and

AMV = Household asset Monetary value.

The total household income was based on the 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 which a household owned.

3.0 Results and Discussion

This section presents the results on opportunities of out-grower scheme for participating household, constraints to participate in out-grower scheme and investor farm employment as well as comparisons of livelihood outcomes among MHHs and FHHs, livelihood outcomes among out-growers, investor farm worker and non-participants and lastly livelihood outcomes across villages.

3.1 Opportunities and Challenges of Large-Scale Agricultural Investments

3.1.1 Opportunities of out-grower scheme by household headship

The study revealed that there was a statistically significant association between opportunities for household engaging in out-grower scheme and household headship

($\chi^2 = 38.44$; $p < 0.05$) (Table 2.2).

Table 2.2: Opportunities of out-grower scheme by household headship (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 0.01 level

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

3.1.2 Constraints to out-grower Scheme by household headship

The study revealed that there was no statistically significant association in terms of constraints between MHHs and FHHs that are engaged in the out-grower scheme ($\chi^2 = 10.29$; $p < 0.05$) (Table 2.3). This implies that MHHs and FHHs participating in out-

grower scheme share similar constraints. All MHHs and FHHs participating in sugarcane out-grower scheme cited low sucrose level as their major constraints.

Table 2.3: Constraints to out-grower scheme by household headship (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 (FGD) supported the findings in Table 2.3, 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 money, sucrose level will read 5-7, which is very low...” (FGDs 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 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 as well as in weighing sugarcane deliveries and calculating the out-growers' payments (Key and Runsten, 1999; Poulton *et al.*, 2010; Smalley, 2013; Smalley, 2014; Smalley *et al.*, 2014). Sucrose level also depends on agronomic practices, and if out-growers are not adhering to the recommended agronomic practices, they are likely to record low sucrose level.

Discussion with a KSCL Extension Officer confirmed that:

‘...There has been a record of low sucrose level in the previous years. When sugarcane remains in the farm for a long time without been harvested; it can also result in a decrease in yields and a decline in sugar content...’ (KIIs participant in Msolwa Ujamaa Village, 7th October 2016).

Smalley *et al.* (2014) share a similar concern that a decline in sucrose level had agronomic explanations such as: farmers harvest sugarcane before maturing, inadequate or fake fertilizer application, lack of irrigation, recurrent of smut disease and white scale pest, and late harvesting of sugarcane in the season.

3.1.3 Constraints of investor farm employment by household headship

The study findings revealed that there was no a statistically significant association between constraints for households participating in investor farm employment and household headship ($\chi^2 = 9.09$; $p < 0.05$) (Table 2. 4).

**Table 2.4: Constraints of investor farm employment by household headship
(n = 126)**

Constraints	MHHs Counts	FHHs Counts	Total counts	Chi- square/Sig.
Low wages	85	11	96	9.090
Seasonal condition of work	47	10	57	0.106
Poor work condition	82	5	87	
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 imply that both MHHs and FHHs were affected by low wages, lack of transparency in wage system and payment deduction. This can be attributed to the fact that most of the permanent employments in large scale agricultural investments require well trained personnel who, in most cases, are not available in the rural areas. The findings in Table 2.4 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 casual 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 most of wage employments which created by large-scale agricultural investments are taken by men. Studies by Matenga and Hichaambwa (2016) in Zambia found that wage employments which were created by large-scale agricultural investments are gendered with men securing most of the 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 2.5.

Table 2.5: 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 the 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 from ANOVA indicate that there were statistically significant differences in livelihood outcomes among households in the out-grower scheme, investor farm workers and non-participants at $p < 0.05$ (Table 2.6).

Table 2.6: Livelihood outcomes among out-growers, investor farm 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		
	Total	373	14.99		

*Mean Significant at 1% level

According to Pallant (2011), if there are statistical significant results from analyses, there is a difference somewhere between groups. However, it does not specify which groups differ from one another. Multiple comparisons were used to identify the differences in livelihood outcome for each pair of household. The results from multiple comparisons (Table 2.7) revealed livelihood outcome were significantly different across those participating in these schemes, out-grower, non-participants, and investor farm employment.

Table 2.7: 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 0.1%, 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 is likely to increase crop productivity and hence increase income that households receive from selling sugarcane. Previous studies have indicated that large scale agricultural investments that adopt the out-grower scheme model have resulted into positive effects on the livelihood of participating households (Schupbach, 2014; Hall *et al.*, 2015; Hall *et al.*, 2017; Herrmann, 2017; Yaro *et al.*, 2017). Matenga and Hichaambwa (2017) also reported that the effect of large scale agricultural investments to rural communities has resulted into low livelihood outcome for household participating in the investor farm employment. Given that the investor farm employment is characterized by low wages and seasonality nature of work, it is obvious that households participating in the investor farm employment will get low livelihood outcomes. Likewise, studies by Osabuohien (2014); Herrmann and Grote (2015); Osabuohien *et al.* (2016); Herrmann (2017) reported that out-growers achieved significantly higher livelihood outcome compared to both 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 the livelihood outcomes across villages at $p < 0.05$ (Table 2.8). It was anticipated that households in the 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 2.8: 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 is not significant at the 5% level

During KIIs one participant had this to say,

“...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)

These findings imply that the out-grower scheme has contributed to improved livelihood outcome to elite coming to secure land in the area. This is attributed to an increase of pressure on land for sugarcane production and elite capture of land close to sugarcane producing areas.

The FGDs participants also shared similar concerns. During FGDs session in Sanje village participants had this to say,

“...Households in sugarcane growing areas are facing increasing land demand, and this has resulted into household commuting to Ikule, Signali and Kiberege villages to grow food crops...” (FGDs in Sanje Village, 11th October 2016).

Increasing demand on land and elite capture has an implication on household food security as well as household allocation of labour in the 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 among smallholder out-growers and it has as a result reduced their livelihood outcomes. As reported by Nombo (2010), due to increasing demand on land in sugarcane growing areas, households are forced to acquire land in the far-away villages.

4.0 Conclusions and Policy Recommendations

Large-scale agricultural investment in Kilombero Valley has the potential of improving the livelihood outcomes. The livelihood outcomes among MHHs and FHHs participating in large-scale agricultural investments revealed a household headship differential whereby MHHs derived more benefits from their engagement in large-scale agricultural investments than was the case with FHHs. In order to bring equitable livelihood outcomes among households' participating in large-scale agricultural investments, it is recommended to 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 them to have more access and control of the productive resources including sugarcane land as well as addressing the constraints for household participation in the out-grower scheme. This can also be done by strengthening out-growers association through training out-growers on their roles while in contract with investors. They need also to ensure 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.

References

- Baumgartner, P., von Braun, J., Abebaw, D. and Müller, M. (2015). Impacts of large-scale land investments on income, prices and employment: Empirical Analyses in Ethiopia. *World Development* 72: 175–190.
- Cai, J., Ung, L., Setboonsarng, S. and Leung, P. (2008). Rice Contract Farming in Cambodia: Empower Farmers to move beyond the contract toward Independence. ADBI discussion paper No. 109, 27pp.
- Cotula, L., Oya, C., Codjo, E.A., Eid, A., KakrabaAmpeh, M., Keeley, J., Kidewa, A. L., Makwarimba, M., Seide, W. M., Nasha, W. O., Asare, R.O. and Rizzo, M. (2015). Testing claims about large land deals in Africa: Findings from a multi-country study. *Third World Quarterly* 50 (7): 903–925.
- Courtney, A.M. (2017). The value of mixed methods research: A mixed methods study. *Journal of Mixed Methods Research* 11(2):202-222.
- FAO (2012). Impact of foreign agricultural investments on developing countries: evidence from case studies. [<http://www.fao.org/economic/est/issues/investments>] site visited on 14/4/2016.

- Glover, D. and Kusterer, K. (1990). *Small Farmers, Big Business: Contract Farming and Rural Development*. The Macmillan Press. Hampshire, England. 169pp.
- Glover, S. and Jones, S. (2016). Can Commercial Farming Promote Rural Dynamism in Sub-Saharan Africa?, World Institute for Development Economics Research (WIDER) Working Paper 120, 21pp.
- Hall, R., Edelman, M., Borras, S.M., Scoones, I., White, B. and Wolford, W., (2015). Resistance, acquiescence or incorporation? An introduction to land grabbing and political reactions ‘from below’. *Peasant Studies* 42(3-4): 467-488.
- Hall, R., Scoones, I. and Tsikata, D. (2017). Plantations, out growers and commercial farming in Africa: Agricultural commercialization and implications for agrarian change, *Peasant Studies* 44 (3): 515-537.
- Herrmann, R. and Grote, U. (2015). “Large-scale agro-industrial investments and rural poverty: evidence from sugarcane in Malawi.” *Journal of African Economies* 24(5): 645-676.
- Herrmann, R.T. (2017). Large-scale agricultural investments and smallholder welfare: a comparison of wage labour and out grower channels in Tanzania. *World Development* 90: 294-310.
- Hichaambwa, M. and Matenga, C. (2016). Which Large-scale Agricultural Commercialization Models Offer the Best Opportunities for Improved Local

Livelihood in Zambia, Indaba Agricultural Policy Research (IAPRI) Policy Brief No. 80. [<http://iapri.org.zm>] site visited on 22/7/2017.

ILO (2017). Improving Market access for Smallholder Farmers: What works in out-grower Schemes-Evidence from Timor-Leste. Issue Brief. No. 1, 5pp.

Key, N. and Runsten, D. (1999). Contract farming, smallholders and rural development in Latin America: The organization of agro-processing firms and the scale of out-grower production. *World Development* 27 (2): 381-401.

Knapman, C. and Sutz, P. (2015). Reconsidering Approaches to Women's Land Rights in Sub-Saharan Africa International Institute for Environment and Development (IIED) Policy brief. Retrieved from [<http://pubs.iied.org/17150IIED>] site visited on 12/07/2017.

Matenga, C. R. (2016). Out-growers and livelihood: The case of Magobbo smallholder block farming in Mazabuka District in Zambia, *Southern African Studies* 43(3): 551-566.

Matenga, C. (2014). 'Differential gender impacts of Magobbo Smallholder Out grower Sugar Scheme in Mazabuka District, Zambia'. Presentation at the Agricultural Investment, Gender and Land conference, Cape Town, 5-7 March. 8pp.

Matenga, C.R. and Hichaambwa, M. (2017). Impact of land and agricultural commercialization on local livelihoods in Zambia: Evidence from three models, *Peasant Studies* 44(3): 574-593.

- Mwambi, M. M., Oduol, J., Mshenga, P. and Saidi, M. (2016). "Does contract farming improve smallholder income? The case of avocado farmers in Kenya". *Journal of Agribusiness in Developing and Emerging Economies* 6(1): 2-20.
- Nolte, K. and Ostermeier, M. (2017). Labour Market Effects of Large-scale Agricultural Investments: Conceptual Considerations and Estimated Employment Effects. [<http://DOI.10.1016/j.worlddev.2017.05/012>] site visited on 13/8/2017.
- Nombo, C. (2010). 'Sweet Cane, Bitter Realities: The Complex Realities of AIDS in Mkamba, Kilombero District, Tanzania', in Niehof, A., Rugalema, G. and Gillespie, S. (eds), *AIDS and Rural Livelihoods*, London, UK: Earthscan, pp. 61-76.
- Osabuohien, E.S. (2014). "Large-scale Agricultural Land Investments and Local Institutions in Africa: The Nigerian Case Issues." *Land Use Policy* 39: 155–165.
- Osabuohien, E.S., Herrmann, R., Efobi, U.R., Gitau, C.M.W. (2016). Female Labour Outcomes and Large-scale Land Investments in Tanzania, African Growth and Development Policy Modelling Consortium (AGRODEP) Working Paper No.0038, 36pp.
- Pallant, Y. (2011). *SPSS Survival Manual*. [www.Allenandunwin.com/spss]. site visited on 11/12/2016).

- Poulton, C., Dorward, A. and Kydd, J. (2010). The future of small farms: new directions for services, institutions and intermediation. *World Development* 38: 1413-1428.
- Ripley, M. (2017). Improving Market Access for Smallholder Farmers: What Works in Out-grower Schemes-Evidence from Timor-Leste, International Labour Organization (ILO) Issue Brief 1, 5pp.
- Rocca, V. (2016). Gender and Livelihoods in Commercial Sugarcane Production: A Case Study of Contract Farming in Magobbo, Zambia. LACA (Land and Agricultural Commercialization in Africa) Working Paper 136. 23pp.
- Saigenji, Y. (2010). *Contract Farming and Its Impact on Production Efficiency and Rural Household Income in the Vietnamese Tea Sector* [Disertasi]. Faculty of Agricultural Sciences. University of Hohenheim. Stuttgart, Germany. 152pp.
- Schupbach, J.M. (2014). *Foreign Direct Investment in Agriculture: The Impact of Out-grower schemes and Large-scale Farm employment on Economic Well-being in Zambia*, A thesis for Doctor of Sciences of ETH Zurich, 155pp.
- Smalley, R. (2013). Plantations, contract farming and commercial farming areas in Africa: A comparative review. Future Agricultures Working Paper, 55, 73pp.
- Smalley, R. (2014). Large-scale Commercial Agriculture in Africa: Lessons from the Past. Future Agriculture Consortium (FAC) Policy Brief 65, 8pp.

- Smalley, R., Sulle, E., Malale, L. (2014). The Role of State and Foreign Capital in Agricultural Commercialization: The Case of Sugarcane Out-growers in Kilombero District, Tanzania, Future Agricultures, Working Paper No. 106, 38pp.
- Sokchea, A. and Culas, R.J. (2015). Impact of contract farming with farmer organizations on farmer's income: a case study of reasmey stung senagricultural development cooperative in Cambodia, *Australasian Agribusiness Review* 23(1): 1-11.
- Sulle, E. (2017). Social differentiation and the politics of land: sugar cane outgrowing in Kilombero, Tanzania. *Southern African Studies* 43(3): 517-533.
- Wendimu, M.A. (2015). *Large-scale Agriculture and Out-grower Schemes in Ethiopia: Land Acquisition, Productivity, Labour Markets and Welfare Effects*, PhD Thesis for Partial Fulfilment of PhD School of the Faculty of Science University of Copenhagen, 190pp.
- Wendimu, M.A., Henningsen, A. and Gibbon, P. (2016). Sugarcane out-growers in Ethiopia: "Forced" to Remain Poor?. *World Development* 83: 84-97.
- Yaro, J.A., Teye, J.K. and Torvikey, G.D. (2017). Agricultural commercialisation models, agrarian dynamics and local development in Ghana. *Peasant Studies* 44(3): 538-554.

CHAPTER THREE

Socio-Economic Determinants of Household Participation in Out-growers Scheme and Investor Farm Employment in Kilombero Valley, Tanzania

Elimeleck P. Akyoo, John N. Jeckoniah and Samwel J. Kabote

Department of Development Studies, College of Social Sciences and Humanities, Sokoine University of Agriculture, P.O. Box, 3024, Morogoro, Tanzania.

Corresponding author email: eparmena@yahoo.com or eparmena@gmail.com

Target Journal and Status: Journal of Continue Education and Extension, paper under review process.

Abstract

Large scale agricultural investment has the potential of improving livelihoods of participating households. However, scientific debates on the socio-economic determinants of households' participation in out-growers scheme and investor farm employment have not been conclusive. This paper aims at examining the socio-economic determinants of household participation in the out-growers and investor farm wage employment. The paper adopted a cross-sectional research design whereby exploratory sequential research strategy which involved the initial phase of qualitative data collection and analysis approaches followed by a phase of quantitative data collection and analysis were adopted. A total of 376 respondents were involved in the survey. Qualitative data were analysed using content analysis while quantitative data were analysed using descriptive and inferential statistical analysis. The results indicate that gender variables (age and household headship), group membership, access to credit, distance from household premises to investor and asset ownership were important predictors of household

participation in the out-grower scheme ($P < 0.05$). The Results indicate further that gender variables (age, household headship and household head marital status), household asset, household income and land size significantly influenced household participation in investor farm employment ($P < 0.05$). Therefore, household participation in the out-grower scheme favour youth household head, MHHs, household in groups, household with higher land size, less access to credit and household with fewer assets. Participation in investor farm wage employment favours those households with older age, FHHs, low income, few assets, married and households with large land size. It is recommended that, the Government should create the enabling environment that would attract more FHHs and those with small land size to engage in sugarcane out-growing. This can be done by ensuring equitable land distribution to allow FHHs and less land secured households who seem to lack enough land to engage in out-grower scheme.

Key words: Large-scale agricultural investments, Out-growers scheme, Investor farm employment, Gender, Kilombero Valley.

1.0 Introduction

The significance of large-scale agricultural investment that integrates household in the out-grower scheme and investor farm wage employment to rural households' livelihoods cannot be over-emphasized. Different large-scale agricultural investment models including plantation modes and out-grower schemes provide different benefits that could support household livelihoods. According to Herrmann (2017), development of large-scale agricultural investments is considered by many as a major threat to the livelihoods of smallholder farmers, while some argue that it is an opportunity to them. In addition, out-grower scheme is increasingly being recognized as the best farming model of addressing production and marketing of agricultural commodities in developing countries (Oya,

2012). Out-grower scheme involves large-scale production and processing facilities surrounded by out-growers farms that range widely in size (Rocca, 2016). Investor farm wage employment in this study refers to employment of the household member in the investor farm.

Some of the analysts have suggested that out-grower scheme which is considered as inclusive farming model improves access to markets, credit and technology, employment, provision of agricultural extension and indirectly empowers women and youths and develops a successful commercial culture (Singh, 2006; Prowse, 2012; Glover and Kusterer, 2016). Inclusiveness of out-grower scheme implies that it integrate smallholder farmers into markets with underlying principles that there are mutual benefits for participating household and the investor and which ultimately has to result in getting households out of poverty and improving food security (FAO, 2015). On the other hand, plantation farming model is reported to generate relatively better paid employment for permanent skilled labourers (Hakizimana *et al.*, 2017).

There are widespread concerns that out-grower scheme and investor farm wage employment benefits more men than women as they differ in terms of socio-economic characteristics such as access to credit, extension services, training, land, participation in social groups and income and asset endowment (Dancer and Sulle, 2015). Previous experiences in Sub-Saharan Africa, including Tanzania, show that women are losing out from large-scale agricultural investments. Studies by Daley (2011), FAO (2011), Mutopo *et al.* (2015), UNCTAD (2015) and Sexsmith (2017) reported that women are less likely to work for wages as large-scale agricultural investments have produced gender division of labour. Likewise, another study in Zambia indicates that men were contract holders in sugarcane out-grower scheme, and sugar dividends were received by men, while women

were involved in the production of food crops for home consumption (Hall *et al.*, 2015). The study also shows that labour opportunities in the scheme were seasonal, short term and that most of seasonal workers were men. Only a few women benefitted from employment opportunities and these were concentrated in casual jobs such as weeding and planting, while men dominated irrigation, cane cutting, fertilizer application, field supervision and truck driving which were considered more stable. Studies in Tanzania (e.g. Locher and Sulle, 2013; Dancer and Sulle, 2015) show gender differentiated between young male cane cutters and weeders majority of whom are women and older men. Comparing out-grower scheme and plantation model, overall, women experience lower level of pay and less job security than men (Renzaho *et al.*, 2017) in plantation model than is the case with men.

Considering that women are not a homogenous group, they are differentiated in terms of how they are constrained in their participation in the out-grower scheme and investor farm employment. Poor women and with limited livelihood options participate more in investor farm employment (Smalley, 2013). Studies (e.g. Oya (2013; Rocca, 2016) found a strong relationship between labour market participation and female divorce or widowhood. There was a correlation between divorced and widowed status of women and opportunities for access to better quality employment. Married women were found to be negatively affected in their participation in the scheme and access to employment as they were concentrated more in food crop production and domestic work (Rocca, 2016). Women lack tenure security and this inhibits their access to resources and constitute a barrier to entry into out-growing. Gender ideologies, where women's farm work is regarded as reproductive labour, also contribute to the low proportion of registered women as out-growers in some areas (Renzaho *et al.*, 2017). Studies (e.g. Tsikata and Yaro, 2013) also show that large-scale agricultural investment creates employment opportunities for women

although women dominate only casual positions with lower remuneration. Other studies including those by Dolan and Sorby (2003); Singh (2003) Maertens and Swinnen (2009) in Kenya, Uganda, Zimbabwe, Columbia and Ecuador reported that women occupied at least 50% of the employment in flowers, canola, poultry and vanilla investments. In addition, White and White (2012) assert that in the oil palm plantation in North Ghana, women had greater compensated productive work since they dominated the daily workforce.

It is evident from the reviewed literature that studies on socio-economic determinants of household participation in out-grower scheme and investor farm employment are inconclusive. This is because some authors contend that the household socio-economic determinants of household participation in out-grower scheme and investor farm wage employment are context specific and depend on the nature of contract as well as the type of enterprise in question (FAO, 2011). In this case, the socio-economic determinants of household participation in the out-growers scheme and investor farm employment cannot be generalized based on the reviewed literature. A thorough knowledge on the socio-economic determinants of rural household participation in the out-grower scheme and investor farm employment in Kilombero Valley is pertinent so as to inform out-grower scheme and investor farm wage employment programming and targeting. This study specifically aimed at (i) analysing socio-economic determinants of household participation in out-grower scheme; and (ii) analysing socio-economic determinants of household participation in investor farm employment in Kilombero Valley.

2.0 Methodology

The study was conducted in Kilombero Valley in Kilombero District. Four villages were selected purposively: two villages around Kilombero Sugar Company Limited (KSCL)

were selected based on two criteria, namely the number of out-growers and the presence of out-growers' association, and households working for KSCL. Villages selected on these criteria were Sanje and Msolwa Ujamaa. Other two villages selected were those with households working with Kilombero Plantation Limited (KPL). The villages selected were Mchombe and Mngeta.

A cross-sectional research design was adopted. The sampling unit was a household involving household head or/and spouse. Exploratory sequential research strategy involved data collection and analysis which started with the initial phase of qualitative data collection and analysis followed by a phase of quantitative data collection and analysis. The exploratory sequential research strategy helps to gain deeper, broader understanding of the phenomenon and integration of the results (Courtney, 2017). The qualitative phase of data collection involved Focus Group Discussions (FGDs) and Key Informants Interviews (KIIs). A total of seven FGDs were conducted with each FGD having six to eight participants who were considered to be knowledgeable in the out-grower scheme and investor farm employment. Based on their knowledge in relation to the out-grower scheme and investor farm employment as well as their position, fourteen KIIs were purposely selected. These included two Out-grower Association Administrative Secretaries, three Ward Executive Officers (WEO), four Village Executive Officers (VEO), two representatives from KPL and KSCL, one representative from SAGGOT, one representative from Sugar Board of Tanzania and Kilombero District Agricultural, Irrigation and Cooperative Officer (DAICO). The quantitative phase of data collection involved a household survey whereby 400 respondents were involved. Using a household village register, the village sub-samples were determined from each village and thereafter, a simple random sampling was used to select respondents from each village. Some respondents were dropped from the sample due to incomplete data resulting into a sample

of 376 which is (94%) of the total sample size expected. Qualitative data were analysed by content analysis whereby the collected information was organized into abstract themes categorized based on the research objectives.

Quantitative data were analysed using Statistical Package for Social Sciences (SPSS) Statistics, version 20. Binary Logistic Regression was used to analyse socio-economic factors influencing household into participating in the out-grower scheme and investor farm employment. The explanatory variables which were entered in the model were those informed by empirical literature review and theoretical review.

The model used was:

$$\text{Logit}(p_i) = \log(p_i/1-p_i) = b_0 + b_1x_1 + b_2x_2 + \dots + b_{12}x_{12} + \mu_i \text{ (Agresti and Finlay, 2009)}$$

Where:

$\text{Logit}(p_i) = \ln(\text{odds}(\text{event}))$, that is the natural log of the odds of an event occurring
 $p_i = \text{prob}(\text{event})$, that is the probability that respondents engage in the out-growers and investor farm employment.

$1-p_i = \text{prob}(\text{nonevent})$, that is the probability that the respondent will not engage in the out-growers and investor farm wage employment.

b_0 = constant of the equation,

b_1 to b_{12} = coefficients of the independent (predictor, response) variables,

k = number of independent variables,

x_1 to x_{12} = independent variables entered in the model.

X_1 = Age (measured in years)

X_2 = Household headship (1 if male headed household, 0 if otherwise)

X_3 = Years of schooling (measured in years)

X_4 = Land size (measured in acres)

X_5 = Access to credit (1=access and 0 =no access)

X_6 =Marital status (1 if married, 0 if otherwise)

X_7 = Group membership (1 if yes, 0 if otherwise)

X_8 = Access to extension services (measured by frequency of visit by extension officer),

X_9 = Distance to the investor (measured in km) and

X_{10} = Asset monetary value (measured in TZS).

X_{11} = Household size (measured by number of people in the Household)

X_{12} = Dependency ratio (measured by number of people below 15 and above 64)

X_{13} = Household total income (measured in TZS)

3.0 Results and Discussion

This section presents the results on household socio-economic characteristics, socio-economic determinants of households' participation in the out-grower scheme as well as socio-economic determinants of households' participation in the investor farm employment.

3.1 Household's Characteristics

The findings on household characteristics which are presented in Table 3.1 reveal that MHHs and FHHs had the mean age of 41.4 and 46.8 years respectively. This suggests that MHHs were younger compared to FHHs. This trend may be attributed to the fact that sugarcane farming is a labour intensive activity which requires people with active age. As observed by Girei and Giron (2012), the level of involvement in sugarcane out-growing tends to increase with the optimum age group and similarly starts to drop with an increase in age. Moreover, MHHs and FHHs had the mean of 7.0 and 5.3 years of schooling respectively. These results suggest that both MHHs and FHHS were likely to participate in the out-grower scheme as they were literate enough to use services from the out-grower

associations as well as signing contract with the company. Few household heads had education of above primary school level. The possible explanation is that educated people tend to shun agriculture for white colour jobs, and they are more concerned with time value of money and would prefer to invest in projects with quick returns and which are highly profitable. Studies by Bahaman *et al.* (2009) revealed that out-grower scheme is among the major choices for those with lower education.

Table 3.1: Households' socio-economic characteristics (n = 376)

Variable	MHHs	FHHs
Age of the HH	41.4(14.2)*	46.8(16.7)
Years of schooling	7.0(2.7)	5.3(3.2)
Household size	4.2(2.0)	3.6(1.8)
Land size	2.8(3.4)	2.0(2.1)
Frequency of extension visit	0.6(1.5)	0.38(1.0)
Distance to investor	11.6(6.9)	11.8(5.9)
Asset ownership	4565137(8580484)	3884693(6300511)
Total income	2527382(3190548)	1747095 (2768879)

*The numbers in brackets are standard deviations of the means, and the numbers out of brackets are means

The MHHs with the mean land size of 4.2 ha were more land secured compared to FHHs who had the mean land size of 3.6 ha. This suggests that MHHs had more land which is required to join out-grower schemes. As Kiwanuka and Machethe (2016) indicate, access to land has a positive implication in participating in the out-grower scheme. MHHs had higher frequency of being visited by extension agents than FHHs with the mean visit of 0.6 and 0.3 per year respectively. These findings suggest that MHHs had higher chances of participating in the out-growers, and hence of having more contacts with company Extension Officers. Again, MHHs had assets with more value (TZS 4 565 137) than FHHs (TZS 3 884 693). This suggests that MHHs had more chances of participating in the out-grower scheme than FHHs. Studies by Escobal and Cavero (2012 and Kiwanuka and

Machethe (2016) reported that households with more assets had more chances of participating in the out-grower scheme. MHHs and FHHs had the mean income of TZS 2 527 382 and TZS 1 747 095 respectively. This implies that MHHs had more income than FHHs and, since sugarcane is a capital intensive crop, MHHs have more chances of participating in the out-grower scheme. This finding is in contrast to the findings from some previous studies which indicated that households with lower income are more attracted to be part of agricultural community and out-grower scheme is one of the alternatives that they could choose (Bahaman *et al.*, 2009). The results in Table 3.2 show that few MHHs and FHHs, that is, 24.3% and 27.5% respectively had access to credit. This implies that both MHHs and FHHs had little access to credit; and access to credit in the area is still a challenge to poor household.

About group membership, 45% of MHHs were in groups while 40% of FHHs were in groups. This suggests that MHHs had more chances of joining out-grower association. Studies by Sharma (2008), Saigenji (2010) and Sambuo (2014) established that household membership in any kind of organization positively affects household chances of participating in the out-growers scheme. The results show that 83.1% of MHHs were married. This might imply that MHHs have additional family labour supply to maintain their out-grower scheme. A study by Narayan (2010) indicates that married couples are expected to influence more households to engage in the out-grower scheme when compared to household heads that are single; this is because married households mean more labour for farming.

Table 3.2: Households' socio-economic characteristics (n = 376)

Variable	MHHs	FHHs
Access to credit	72 (24.3)*	22 (27.5)
Group membership	133 (44.9)	32 (40.0)
Marital status of HH		
Single	41(13.9)	23 (29)
Married	246 (83.1)	0
Separated	7 (2.4)	21 (26.3)
Divorced	0	3(3.8)
Widow/widower	2 (0.7)	33 (41.3)
Total	296	80

*The numbers in brackets are percentages while those out of brackets are frequencies

3.2 Socio-Economic Factors for Household Engagement in Out-growers Scheme

Binary logistic regression was used to model the selected variables and household participation in the out-grower scheme as presented in Table 3.3. The results show that, among the thirteen (13) variables, seven variables: gender variables (age of the household head and household headship), household group membership, and household access to credit, asset ownership, distance to the investor and land size were found to be important predictors of household participation in the out-grower scheme ($p < 0.05$). The strongest predictor was household group membership ($p = 0.000$). The findings in Table 3 indicate that the Hosmer and Lemeshow test showed a Chi-square statistics of 6.523 ($p = 0.589$). This means that the overall model predicted the outcome well because the Hosmer and Lemeshow test Chi-square was not significant (Field, 2013). The findings show further that Nagelkerke pseudo R^2 statistics which represents the adjusted Cox and Snell Pseudo R^2 statistics was 0.569, which implies that 56.9% of the variance in household participation in the out-grower scheme was explained by the independent variables that were entered in the model. Because the Omnibus Chi-square was significant ($p = 0.000$), the overall model predicted the outcome well (Field, 2013). Wald coefficients associated with individual independent variables help us realize the relative importance of each independent variable. A greater Wald statistic implies that the independent variable

associated with it has a higher contribution to the happening of the dependent variable. In Table 3.3, the Wald statistic value of distance of household homestead to the investors which was Wald = 29.167 was the maximum and statistically significant at $p \leq 0.001$. Also, group membership that had a Wald statistic value of 22.071 was the second highest and statistically significant at $p \leq 0.01$. The implication of this finding is that as the distance increases the likelihood of participating in the out-grower scheme decreases.

Table 3.3: Socio-Economic factors influencing household participation in out-growers scheme (n=376)

Variables	Coefficient (B)	S.E.	Wald	Sig.	Exp(B)
Age of the household head	-0.062*	0.015	18.425	0.000	0.940
Household head marital status	-0.880	0.525	2.810	0.094	0.415
Household head years of schooling	0.039	0.070	0.316	0.574	1.040
Household membership in group/organization	1.979*	0.421	22.071	0.000	7.2346
Household headship	1.370**	0.429	10.214	0.001	3.934
Household access to credit	-1.744*	0.492	12.534	0.000	0.175
Household access to extension services	0.034	0.127	0.071	0.790	1.034
Distance to investor	-0.145*	0.027	29.167	0.000	0.865
Household asset ownership	0.000**	0.000	5.797	0.016	1.000
Household income	0.000	0.000	2.763	0.096	1.000
Household land size	0.232	0.067	11.823	0.001	0.793
Household size	0.113	0.130	0.752	0.386	1.119
Dependency ratio	0.015	0.193	0.060	0.939	1.015

Omnibus Tests of Model Coefficients (Chi-square = 171.128; sig. = 0.000); Cox & Snell R Square = 0.366, Hosmer and Lemeshow Test (Chi-square= 3.614) sig. = 0.890); Nagelkerke R Square = 0.557; *and ** indicate levels of significance at 1% and 5% respectively

The relationship of age of the household head and participation in out-grower scheme in Table 3.3 was found to be statistically significant ($p = 0.000$) implying that the age of the household head was a significant predictor of the household's participation in the out-grower scheme. The finding also indicates that if the age of the household head increases by one unit, participation in out-grower scheme also decreases by 0.940 units as indicated

by the odds ratio which was 0.940. This implies that household heads with more advanced age (one unit higher) were 0.940 less likely to participate in the out-grower scheme. This is because sugar cane production is a labour intensive activity that requires energetic farmers. Similar results were also reported by Girei and Giron (2008) and Minot *et al.* (2009).

Gender of the household heads significantly influenced household chances of participating in the out-grower scheme. The findings indicate further that if MHHs had to participate in the out-grower scheme the odds ratio was to be 3.934, implying that the household headed by men had 3.934 times chances as those FHHs of participating in the out-grower scheme. This finding implies that MHHs are more likely than FHHs to participate in the out-grower scheme. The findings correspond with those in a study by Tsikata and Yaro (2013); Hakizimana *et al.* (2017) and Yaro *et al.* (2017) who reported that FHHs have less chance to participate in out-grower scheme.

Membership in a group was found to have a positive significant influence on the likelihood of a household to be an out-grower. The findings indicate that, the odd ratio for group membership was 7.236 implying that households with membership in groups are 7.236 times more likely to participate in the out-grower scheme. This is not surprising because these are members in social organizations and this provides them with the opportunity to be exposed to training, information and have access to credit, extension services and to agricultural inputs which might enhance their participation in the out-grower scheme. Since more households headed by men were in groups it is evident that more MHHs were engaged in the out-grower scheme than was the case with FHHs. Similar findings are reported in other studies by Sharma (2008); Saigenji (2010) and

Sambuo (2014) who established that household membership in the organization positively affects contract farming participation.

The results revealed further that access to credit exerted a negative and statistically significant effect on chances of a household to participate in the out-grower scheme. The findings indicate further that odds ratio for access to credit was 0.175 implying that household with access to credit were 0.175 less likely to participate in the out-grower scheme. This might suggest that households with more credits tend to diversify their livelihood strategies and the out-grower scheme might not be their main strategy. MHHs had more credit than FHHs as they had more resources that could be used as collateral and thus increasing their chances of participate in the out-grower scheme. These findings concur with those reported by Jabbar *et al.* (2007).

Distance of the household homestead to the investor showed negative but statistically significant influence on the household chances of participating in the out-grower scheme. The findings revealed further that when distance increased by one km, the odds ratio became 0.865, implying that households residing far away from the investor are 0.865 times less likely to participate in the out-grower scheme. An increase in the distance means the company incurring more costs of transporting sugarcane to the factory for crushing. This is further supported by discussion with Kilombero Sugar Company (KSCL) official during key informant interviews who reported that one of the criteria for the selection of out-growers participants was that the households should be in a distance of not more than 5 km from the KSCL. Similar, results are also reported by Narayan (2010); Wainaina *et al.* (2012) and Kiwanuka and Machethe (2016). The land size owned significantly influenced the household participation in the out-grower scheme. The findings revealed that when the land size increased by one hectare, the odds ratio increase

by 0.793 implying that households with large land sizes are 0.793 more likely to participate in the out-grower scheme. A possible explanation to this could be that households with large arable land size have the opportunity of growing large tracks of sugarcane. Large land size also implies that the household can diversify into other crops and reduce the inherent risk in agricultural production. As reported by Wainaina *et al.* (2012), one of the conditions of join out-grower scheme is access to land; and household with large land sizes have more chances of being out-growers.

Likewise, asset ownership had significant positive effects on household's chances of participating in the out-grower scheme. The odds ratio for asset ownership was 1.000 suggesting that for every unit increase in the asset value, there would be no change on the household's likelihood to participate in the out-grower scheme. It was anticipated that, since sugarcane farming is capital intensive endeavour, households with more assets could have higher chances of participating in the out-growers' scheme in the study area. The results also suggest that MHHs had more assets value than had the FHHs; and this increased their chances of joining the out-grower scheme. Similar findings are reported by Jabbar *et al.* (2007); Escobal and Caverro (2012) and Kiwanuka and Machethe (2016) who revealed that an increase in the asset value had a positively significant effect on chances of the household to participate in contract farming. Also studies by Ossome (2014); Daley and Pallas (2014); Doss *et al.* (2014) and Dancer and Tsikata (2015) reported that status in the community and wealth may determine who benefits and who loses out in the out-growers scheme. Therefore, it can be suggested that MHHs are more likely to participate in the out-grower scheme as they are more asset secured compared to FHHs.

3.3 Socio-Economic Factors for Household Engagement in Investor Farm

Employment

Binary logistic regression was also used to model the selected variables and household participation in the investor farm employment as presented in Table 3.4. The results of the binary logistic regression, which was used revealed that, among the thirteen (13) variables, six variables namely: gender variables (age of the household head, household headship and household marital status), household land size, household asset ownership and household income were found to be important predictors of household participation in the investor farm employment ($p < 0.05$). The strongest predictor among these was the age of the household head ($p = 0.000$). The findings in Table 3.4 indicate that the Hosmer and Lemeshow Test showed a Chi-square statistics of 9.019 ($p = 0.341$) implying that the overall model well predicted the outcome because the Hosmer and Lemeshow test Chi square was not significant (Field, 2013). The findings show further that Nagelkerke pseudo R^2 statistics which represents the adjusted Cox and Snell Pseudo R^2 statistics was 0.339, which implies that 33.9% of the variance in the household participation in the investor farm employment was explained by the independent variables which were entered in the model. Because the Omnibus Chi-square was significant ($p = 0.000$), the overall model well predicted the outcome (Field, 2013). Wald coefficients associated with individual independent variables helped us realize the relative importance of each independent variable. A greater Wald statistic implies that the independent variable associated with it had a higher contribution to the happening of the dependent variable. In Table 3.4, the Wald statistic value of the household headship, which was Wald = 9.873 was the maximum and was statistically significant at $p \leq 0.005$. Also, household land size, which had a Wald statistic value of 8.674 was the second highest and statistically significant at $p \leq 0.001$. This finding suggests that being in the male household headed reduces the chances of the household to participate in the investor farm employment.

Table 3.4: Socio-economic factors influencing household participation in investor-farm employment (n=376)

Variables	Coefficient (B)	S.E.	Wald	Sig.	Exp(B)
Age of the household head	0.059*	0.014	17.386	0.000	1.061
Household head marital status	0.838*	0.330	6.446	0.011	2.311
Household head years of schooling	-0.004	0.060	0.005	0.941	0.996
Household membership in group/organization	-0.259	0.342	0.568	0.451	0.773
Household headship	-1.226**	0.390	9.872	0.002	0.293
Household access to credit	-0.226	0.412	0.301	0.583	0.798
Household access to extension services	0.281	0.172	2.674	0.102	1.325
Distance to investor	0.024	0.021	1.386	0.239	1.025
Household asset ownership	-0.021	0.018	4.833	0.028	0.781
Household income	-0.003	0.002	5.995	0.014	0.999
Household land size	0.301**	0.102	8.674	0.003	1.351
Household size	-0.141	0.118	1.437	0.231	0.868
Dependency ratio	0.273	0.175	2.415	0.120	1.313

Omnibus Tests of Model Coefficients (Chi-square = 155.512; sig. = 0.000); Cox & Snell R Square = 0.339
Hosmer and Lemeshow Test (Chi-square= 9.019) sig. = 0.341); Nagelkerke R Square = 0.465; * and ** indicate levels of significance at 1%, and 5% respectively

The findings showed that the age of the household head was the strongest predictor of the chances of the households to participate in the investor farm employment. The findings were statistically significant at $p = 0.000$ and $\text{Exp}(B) = 1.061$. A Wald of 17.386 demonstrates that the age of the household head contributes significantly to predicting the chances of the households to participate in the investor farm employment. The findings indicate further that when the age of the household head increases by one year, the odds ratio becomes 1.061, implying that older household heads are 1.061 more likely to participate in the investor farm employment. This suggests further that young household

members are more likely to participate in other off-farm activities such as “Boda boda” business that attract more income compared to working in the investor –farm work. During FGDs it was reported that investor farm employment especially sugarcane cutting task was considered by the youth as inferior, strenuous, difficult and had meagre wages.

“... Many youth in this area see sugarcane cutting as an inferior task. You cannot find any sugarcane cutter who was born in this village or in the neighbouring villages; in most cases, can-cutters come from Iringa and Mbeya Regions...”

(FGDs in Sanje Village 30th November, 2016).

Studies by Mbilinyi and Semakafu (1995), Dancer and Sulle (2015) indicate that in the sugarcane sector there is a strong gender differentiation between young male sugarcane cutters and weeders, and the majority of these are women and older men. Also, Knapman *et al.* (2017) report that as a result of large-scale agricultural investment in Uganda and Ghana, the youth were mostly affected due to lack of access to land, they thus have shifted to off-farm occupations and other youth have migrated to urban areas and to other rural areas. With regards to household headship and participation in the investor farm employment the results in Table 3.4 reveal that this was statistically significant ($p = 0.002$), which implies that the household headship was a significant predictor of household participation in the investor farm employment. The findings also revealed that if the household was headed by men, participation in the investor farm employment decreases by 0.293 times as indicated by the odds ratio of 0.293. This implies that those households headed by men were 0.293 times less likely to participate in the investor farm employment. These findings imply that the investor farm employment is not such a lucrative employment to attract men’s participation. This is because of low wages associated with large-scale agricultural investment employment. Similar findings are reported in other studies (e.g. Dolan and Sorby, 2003; Singh, 2003; Maertens and

Swinnen, 2009), that showed that women occupied at least 50% of all employment generated in business investments of flowers, canola, poultry and Vanilla in Kenya, Uganda, Zimbabwe, Colombia and Ecuador. Similar, findings are also reported by Smalley (2013) who also asserted that poor women with limited livelihood options are likely to participate in the employment opportunities created by large-scale agricultural investments. The findings however were in contrast with those reported in other studies (i.e. FAO, 2011; Tsikata and Yaro, 2013; UNCTAD, 2015; Dancer and Tsikata, 2015; Lanz and Daley, 2016) who asserted that employment created by large-scale agricultural investment benefit men more than it did women.

The above contradictions may suggest that MHHs in Kilombero Valley have more income that can be invested in other income generating activities that attract more income than working as casual workers in large scale agricultural investments. The results show further that land size owned had positive significance with the likelihood of household to participate in the investor farm employment. The results indicate that, when land size increase by one hectare the odds ratio also increases by 1.351 implying that the household with larger land size are 1.351 times more likely to participate in the investor farm employment. This results implies that, the household engaging in the investor farm employment is also be likely to combine wage employment and farming activities.

This claim is further supported by FGD's results which indicates that :

“...We normally combine farming in our own field with casual labour at KPL. During farming season some of us do not work for KPL rather we work in our paddy fields and after the harvest we seek for casual labour such as weeding and harvesting of maize which is grown by KPL after they have harvested Paddy...”
(FGD in Mchombe Village, 7th December 2016).

Discussion with KIIs in Mngeta and Mchombe villages also reported that, during the farming season most households concentrate in their paddy fields and after the farming season, especially when the KPL grows irrigated maize, some households find work in the weeding and harvesting of maize. Positive and significance influence of land size can also be explained by the fact that perhaps household with better land holding opted for additional income in casual labour works to finance their farming expenses in the next season. This result is similar to the result in studies by Hakizimana *et al.* (2017); Yaro *et al.* (2017) who also reported that a combination of wage employment and own farming is an important basis for livelihood for the household living in the communities with large-scale agriculture investments.

Marital status significantly influenced household participation in the investor farm employment. Married household heads were found to have had the odds ratio of 2.311 implying that household with married household heads are 2.31 times more likely to participate in the investor farm employment. The possible explanation is that married household heads have a large family sizes and are likely to have extra and unemployed labour, and thus enabling them to allocate this workforce outside the agricultural sector. Similar findings were reported by Hakizimana *et al.* (2017) who found that married households living adjacent to large-scale agricultural investments were diversifying their income sources between on-farm in the out-grower scheme and the off-farm sources especially wage household income significantly negatively influenced household participation in the investor farm employment. the findings indicated further that when household income increases by one unit, the odds ratio becomes 0.999 implying that a household with more income is 0.999 less likely to participate in the investor farm employment. This implies that household with higher levels of income, are less likely to participate in the investor farm employment because they have enough amount of money

to finance their farming activities and still remain with enough for financing other non-farm income generating activities. As reported by Smalley (2013) that the investor farm employment is occupied by poor households and with limited livelihood options.

Household assets ownership negatively influenced the household participation in the investor farm employment. It was revealed further that when household assets increase by one unit, the odds ratio becomes 0.781, which implies that households with more assets are less likely to participate in the investor farm employment. The reasons for this might be that, household assets can act as collateral for accessing credit which can be used to finance farm and other non-farming income generating activities. Similar findings are reported by Davis *et al.* (2010) who found that agricultural wage employment is carried out by households with few assets and that lack the ability to engage in high rewarding income generating activities.

3.4 Conclusions and Recommendations

It can be concluded that household participation in the out-growers scheme is influenced by socio-economic characteristics. Gender variables such as age and household headship influence significantly household participation in the out-grower scheme. Participation in the out-grower scheme tends to increase with an increase in the land size and household membership in groups while it tends to decrease with an increase in the access to credit, distance to the investor, and asset ownership. The likelihood of the household participating in the investor farm employment is also influenced by socio-economic characteristics with gender variables with age, household headship, and household marital status exerting positive significance influence. Household asset ownership, household income and land size increase the chances of household's participation in the investor farm employment. Therefore, household participation in the out-grower scheme favours

young household heads, MHHs, households in groups, household with higher land sizes, households with less access to credit and household with few assets. On the other hand, participation in the investor farm employment favours those households with older HHHs, FHHs, low income, few assets, married and households with large land sizes.

The study recommends to the Local Government Authorities to ensure equitable land distribution in order to attract more FHHs and those with small land sizes to engage in sugarcane out-growing.

References

- Agresti, A. and Finlay, B. (2009). *Statistical Methods for the Social Sciences*. (Fourth Edition). Pearson Prentice Hall, New Jersey. 609pp.
- Bahaman, A.S., Hayrol, M.S., Azril, M. H., Salleh A.H. and Narimah, I. (2009.) ICT contribution in increasing agro-based entrepreneurs 'productivity in Malaysia. *Agriculture Extension and Social Sciences* 5(3): 93-98.
- Casaburi, L., Kremer, M. and Mullainathan, S. (2012). *Contract Farming and Agricultural Productivity in Western Kenya*. Harvard University. 50pp.
- Courtney, A.M. (2017). The Value of Mixed Methods Research: A mixed methods study. *Journal of Mixed Methods Research* 11(2): 202-222.
- Daley, E. (2011). Gendered impacts of commercial pressures on land. International land coalition. [[https://scholar.google.com/scholar?q= Daley+2011+ large+scale+ agriculture+investments&btnG=&hl=en&as_sdt=0%2C5](https://scholar.google.com/scholar?q=Daley+2011+large+scale+agriculture+investments&btnG=&hl=en&as_sdt=0%2C5)] site visited on 25th May 2017.

- Daley, E. and Pallas, S. (2014). Women and land deals in Africa and Asia: Weighing the implications and changing the game. *Feminist Economics* 20(1): 178 – 201.
- Dancer, H. and Tsikata, D. (2015). *Researching land and commercial agriculture in Sub-Saharan Africa with a gender perspective: Concepts, issues and methods* (Working Paper No. 32). Brighton: Future Agriculture Consortium, PLAAS. [http://scholar.google.com/scholar_lookup] site visited on 30/5/ 2017.
- Dancer, H. and Sulle, E. (2015). Gender Implications of agricultural Commercialization: The case of Sugarcane Production in Kilombero District, Tanzania, Working paper No. 118. Institute of Poverty and Land and Agrarian Studies, Brighton, UK. 36pp.
- Davis B., Winters, P., Carletto, G., Covarrubias, K., Quinones, E., Zezza, A., Stamoulis, K., Azzarri, C. and DiGiuseppe, S. (2010). Cross-country comparison of rural income generating activities. *World Development* 38 (1): 48–63.
- Dolan, C. S. and Sorby, K. (2003). Gender and employment in high-value agriculture industries. *Development Studies* 37(3): 39 – 70.
- Doss, C., Summerfield, G. and Tsikata, D. (2014). Land, gender and food security. *Feminist Economics* 20(1): 1 – 23.
- Escobal, J.A. and Cavero, D. (2012). Transaction costs, institutional arrangements and inequality outcomes: potato marketing by small producers in rural Peru. *World Development* 40(2): 329-341.

FAO (2011). State of Food and Agriculture: Women in Agriculture, Closing the Gender Gap for Development, FAO, Rome [<http://www.fao.org/docrep/013/i2050e/i2050e.pdf>] site visited on 14/4/2016.

FAO (2015). *Inclusive Business Models Guidelines for Improving Linkages between Producer Groups and Buyers of Agricultural Produce*, Food and Agriculture Organization of the United Nations (FAO), Rome, Italy. 106pp.

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*, 4th Edition, SAGE Publication Limited, 55 City Road, London. 952pp.

Girei, A.A. and Giroh, Y.D. (2012). Analysis of the factors affecting sugarcane (*saccharum officinarum*) production under the out-growers scheme in Numan local government area Adamawa State, Nigeria. *Advances in Agriculture, Sciences and Engineering Research Journal* 2 (5): 1158-1164.

Glover, D. and Kusterer, K. (2016). *Small Farmers, Big Business: Contract Farming and Rural Development*. St. Martin's Press. New York, 170pp.

Hakizimana, C., Goldsmith, P., Nunow, A.A., Roba, A.W. and Biashara, J.K. (2017). Land and agricultural commercialisation in Meru County, Kenya: evidence from three models, *Peasant Studies* 44(3): 555-573.

Hall, R., Edelman, M., Borras Jr, S.M., Scoones, I., White, B. and Wolford, W. (2015). Resistance, acquiescence or incorporation. An introduction to land grabbing and political reactions 'from below'. *Peasant Studies* 42(3-4): 467-488.

- Herrmann, R.T. (2017). Large-scale agricultural investments and smallholder welfare: A comparison of wage labour and out grower channels in Tanzania. *World Development* 90: 294 – 310.
- Jabbar, M.A., Rahman, M.H., Talukder, R.K. and Raha, S.K. (2007). *Alternative institutional arrangements for contract farming in poultry production in Bangladesh and their impacts on equity*. ILRI (International Livestock Research Institute). Research Report 7, 89pp.
- Kiwanuka, R.N.L. and Machethe, C. (2016). Determinants of smallholder farmers' sector's participation in Zambian dairy interlocked contractual arrangements. *Sustainable Development* 9 (2): 230-245.
- Knapman, C., Silici, L., Cotula, L. And Mayers, J. (2017). *Access to Farmland gets Quick and Dirty in Sub-Saharan Africa*. IIED, London. [<http://pubs.iied.org/17399IIED>] site visited on 3/6/2017.
- Lanz, K. and Daley, E. (2016). *Gender, Land and Agricultural Development in Africa: From Women to Gender*. [<https://landportal.info/sites/landportal.info/files>] site visited 28/5/2017.
- Locher, M. and Sulle, E. (2013). *Foreign Land Deals in Tanzania: An Update and Critical Review on The Challenges of Data Production*. The Land Deal Initiatives, Brighton, UK. 47pp.

- Maertens, M. and Swinnen, J. F. M. (2009). Gender and Modern Supply Chains in Developing Countries, LICOS (Centre for Institutions and Economic Performance) Discussion Paper No.231, 37pp.
- Mbilinyi, M. and Semakafu, A.M. (1995). Gender and Employment on Sugar Cane Plantations in Tanzania. Sectoral and Working Discussion Papers, Agriculture, SAP 2.44/WP.85, Geneva, Switzerland: International Labour Organization. 205pp.
- Minot, N., Miyata, S. and Hu, D. (2009). Impact of contract farming on income: linking small farmers, packers and supermarkets in China. *World Development* 37: 1781-1790.
- Mutopo, P., Chiweshe, M.K. and Mubaya, C.P. (2015). *Large-Scale Land Acquisitions, Livelihoods and Gender Configurations in Zimbabwe*. Handbook of Research on In-Country Determinants and Implications of Foreign Land Acquisitions, 144pp.
- Narayan, S. (2010). Contract farming as frictional equilibrium: A theoretical viewpoint with empirical evidence from Southern India. *Sustainable Development* 9(2): 2016-244.
- Ossome, L. (2014). Can the law secure women's rights to land in Africa? Revisiting tensions between culture and land commercialization. *Feminist Economics* 20(1): 155–177.

- Oya, C. (2012). Contract farming in sub-saharan Africa: A survey of approaches, debates and issues. *Agrarian Change* 12(1): 1-33.
- Oya, C. (2013). The land rush and classic agrarian questions of capital and labour: a systematic scoping review of the socioeconomic impact of land grabs in Africa. *Third World Quarterly* 34(9): 1532-1557.
- Prowse, M. (2012). *Contract farming in developing countries: a review*. Agence Française de Développement A Savoir, France. 99pp.
- Renzaho, A.M., Kamara, J.K. and Toole, M. (2017). Biofuel production and its impact on food security in low and middle income countries: Implications for the post-2015 sustainable development goals. *Renewable and Sustainable Energy Reviews* 78: 503-516.
- Rocca, V. (2016). Gender and Livelihoods in Commercial Sugarcane Production: A Case Study of Contract Farming in Magobbo, Zambia. LACA (Land and Agricultural Commercialization in Africa) Working paper 136. 23pp.
- Saigenji, Y. (2010). Contract Farming and Its Impact on Production Efficiency and Rural Household Income in the Vietnamese Tea Sector [Disertasi]. *Faculty of Agricultural Sciences. University of Hohenheim. Stuttgart, Germany*. 152pp.
- Sambuo, D. (2014). Tobacco contract farming participation and income in Urambo; heckma's selection model. *Economics and Sustainable Development* 8 (28): 230-239.

- Sexsmith, K. (2017). 'But we can't call 911': undocumented immigrant farmworkers and access to social protection in New York. *Oxford Development Studies* 45(1): 96-111.
- Sharma, V.P. (2008). India's agrarian crisis and corporate-led contract farming: Socio-economic implications for smallholder producers. *International Food and Agribusiness Management Review* 11(4): 25-48.
- Singh, S. (2003). *Contract farming in India: impacts on women and child workers*. International Institute for Environment and Development [[https://scholar.google.com/scholar?q= Sing+2003+ contract+farming &btnG =&hl=en&as_sdt=0%2C5](https://scholar.google.com/scholar?q=Sing+2003+contract+farming&btnG=&hl=en&as_sdt=0%2C5)] site visited on 3/6/2017.
- Singh, S. (2006). Contract farming system in Thailand. *Economic and Political Weekly* 4(53): 5578-5586.
- Smalley, R. (2013). Plantations, contract farming and commercial farming areas in Africa: A comparative review. Future Agricultures Working Paper, 55, 73pp.
- Tsikata, D. and Yaro, A.J. (2013). 'When a good business model is not enough: Land transactions and gendered livelihood prospects in rural Ghana', *Feminist Economics* 20(1): 1-25.
- United Nations Conference on Trade and Development (UNCTAD). (2015). *The Least Developed Countries Report 2015: Transforming Rural Economies*. United

Nations. [<http://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=1393>] site visited on 14/4/2016.

Wainaina, P.W., Nzuma, J. and Okello, J.J. (2012). *Impact of contract farming on smallholder poultry farmers' income in Kenya*. [https://scholar.google.com/scholar?q=Wainaina+et+al+2012+contract+farming&btnG=&hl=en&as_sdt=0%2C5] site visited on 4th June 2017.

White, J. and White, B. (2012). Gendered experiences of dispossession: Oil palm expansion in a Dayak Hibun community in West Kalimantan. *Peasant Studies* 39(3-4): 995–1016.

Yaro, J.A., Teye, J.K. and Torvikey, G.D. (2017). Agricultural commercialisation models, agrarian dynamics and local development in Ghana. *Peasant Studies* 44 (3): 538-554.

CHAPTER FOUR

The Influence of Household Socio-economic Characteristics and Large-scale Agricultural Investment Factors on Household Livelihood Outcomes in Kilombero Valley, Tanzania

Elimeleck P. Akyoo, John N. Jeckoniah and Samwel J. Kabote

Department of Development Studies, College of Social Sciences and Humanities, Sokoine University of Agriculture, P. O. Box, 3024, Morogoro, Tanzania.

Corresponding author email: eparmena@yahoo.com or eparmena@gmail.com

Target Journal and Status: Journal of African Studies and Development

Abstract

Large-scale agricultural investment plays an important role in improving household income and asset ownership and thereby contributes to household livelihood outcomes. However, empirical evidence on the factors influencing livelihood outcomes is complex and diverse. This study examined socio-economic characteristics and factors of large-scale agricultural investment that influence household livelihood outcomes in Kilombero valley. The quantitative data which were collected through a household survey, which was conducted to 376 randomly selected households were analysed using the SPSS software whereby descriptive and multiple regression analyses were performed to describe household socio-economic characteristics and analyse large-scale agricultural investments factors and selected socio-economic characteristics that influence livelihood outcomes in terms of income and monetary value of assets owned. Qualitative data were analysed using the content analysis method to supplement the quantitative information. The results showed that age, education, household size, land size, group membership, household

participation in the out-grower scheme and livelihood strategies significantly influenced household livelihood outcomes ($p \leq 0.05$), although participation in the out-grower scheme had a negative influence on livelihood outcomes. The paper concludes that the out-grower scheme in the study area reduces the ability of participating households to improve livelihood outcomes while households' participation in the investor farm wage employment does not have any influence on the livelihood outcomes. In addition, household socio-economic characteristics such as age, education, household size, land size, group membership and livelihood strategies are helpful in improving household's livelihood outcomes. The paper recommends that the existing out-grower associations in the study area, through collaboration with Local Government Authorities should set up plans of raising households' livelihood outcomes through ensuring a win-win situation through contracts between large-scale agriculture investors and out-growers. It is also recommended that Local Government Authorities, in collaboration with community based organizations in the study area, should encourage households to join groups by creating awareness on the importance of group membership. The Tanzania Government is advised to support households in the study area and households in similar situation to diversify livelihood strategies through investment in education and training in labour skills for meaningful livelihood outcomes. Local Government Authorities in collaboration with the Central Government should ensure that households in the study area have more access to land in order to allow crop diversification.

Key words: Large-scale agricultural investments, Livelihood outcomes, Kilombero Valley

1.0 Introduction

There has been a growing interest in large-scale agricultural investments in Sub-Saharan Africa since 2008 (Gibbon, 2011). The interest in large-scale agricultural investment have been fuelled by the concerns that these investments play an important role in improving income of smallholder farmers (FAO, 2012). The trend has also been contributed by fear among some food-importing countries for not being able to access sufficient quantities of food for their citizens (Matondi *et al.*, 2011). The term large-scale agricultural investment refers to the purchase of land and user rights through lease or concessions, whether for a short or a long term period (FAO, 2012). Some authors including Cotula (2012) define large-scale agricultural investment as the purchase or lease of vast tracts of land by wealthier, food-insecure nations and private investors from mostly poor, developing countries in order to produce food crops for export. This study conceptualizes large-scale agricultural investment as a process whereby foreign governments, local and foreign companies lease tracts of arable land for large scale agriculture. The debates on large-scale agricultural investments have two polarised strands that have had controversial effects on households' livelihood outcomes.

The proponents of large-scale agricultural investments claim that there are some specific potential benefits including employment opportunities or provision of public goods (Deininger, 2011). The investments are also reported to improve household income and asset stocks which eventually improve household livelihood outcomes (Bellemare, 2012; Herrmann and Grote, 2015). Livelihood outcomes refers to the achievement of livelihood strategies, including generating income, increasing well-being, reducing vulnerability, improving food security and having a more sustainable use of natural resources (Scoones, 1998). In this study, livelihood outcomes refer to the household's ability to increase income and increase assets stock. The benefits of large-scale agricultural investments can

only be realized when households are integrated in large-scale agricultural investments through out-grower scheme or investor farm wage employment. For example, Amrouk *et al.* (2013) indicate that households that participate in large-scale agricultural investments through out-grower scheme achieve higher yields and income, improve assets, input usage and savings. As Barrett *et al.* (2012) argue, household which are integrated in the out-grower scheme overcome the problem of access to credit, quality input, and high value output market or know-how. This argument is criticised because the effects of large-scale agricultural investments on household livelihood outcomes is context specific and depends on the nature of the contract between out-growers and the investor as well as the crops under the contract.

In contrast, critics argue that large-scale agricultural investments do not always translate into livelihood improvement for different categories of households. Scholars, (e.g. Arndt *et al.*, 2010; Deininger and Byerlee, 2012; Oya, 2013; Narayanan, 2014; Baumgartner *et al.*, 2015) report that large-scale agricultural investments negatively influence household livelihood outcomes. It has also been reported that households who participate in the investor farm employment are negatively influenced by large-scale agricultural investments. As reported by Davis *et al.* (2010) wage employment in large-scale agriculture is performed by those households lacking the ability to engage in high-rewarding non-farm or on-farm jobs. As reported by Oya (2013), most of these large-scale agricultural investments particularly wage employment, are associated with simple tasks involving low wages thus affecting negatively household livelihood outcomes. On the other hand, households' participation in large-scale agricultural investments through the out-grower scheme has been reported to be affected negatively in terms of livelihood outcomes. For example, studies by Casaburi *et al.* (2012) and Waswa *et al.* (2012) in Kenya reported that in several cases the anticipated achievements of large-scale

agricultural investments were reported to vary from one area to another and to a large extent households did not necessarily attain the expected livelihood outcomes. The empirical review shows further that some of the reasons for households not achieving anticipated achievements include payment delay, low sucrose level in sugarcane which reduce payments, sugarcane remaining un-harvested and high deductions which reduce out-growers' income and hence reduces their livelihood outcomes (Smalley *et al.*, 2014). This view highlights the exploitative nature of large-scale agricultural investments in developing countries.

The study on which this paper is based adopted DFID's Sustainable Livelihood Framework (SLF) that links households' socio-economic characteristics and large-scale agricultural investments with livelihood outcomes. SLF was selected based on the fact that it allows capturing of rural livelihoods aspects such as assets and activities from which rural livelihood is derived (Ellis, 2000). The framework was also thought to be very important in understanding important livelihood assets that can have an impact on livelihood outcomes in the context of large-scale agricultural investments in the study area.

The SLF considers the portfolio of livelihood assets which households can access namely human, social, financial, physical and natural capital. The impact of these assets on household livelihood outcomes and household assets and livelihood strategies under the influence of large-scale agricultural investment has a bearing on a variety of outcomes. The ability of a household to improve livelihood outcomes depends on its asset endowment, the ability to participate in large-scale agricultural investment through the out-grower schemes and the investor farm employment and its ability in terms of socio-economic characteristics (Borras *et al.*, 2011). Household socio-economic variables such

as education, age, household size, livelihood strategies, land size and group membership may influence access to assets and the attainment of livelihood outcomes.

A number of empirical studies using SLF approach have influenced this choice of approach. For example, Otsuka and Yamano (2006) posit that the main factors affecting household livelihood outcomes include household size, age and sex of the household head, education, health, social capital, asset endowment, and occupation of the household head. In addition, Jansen *et al.* (2014) and Tuyen (2015) show that household size and dependency ratio are negatively related to livelihood outcomes. More dependant and more family members reduce household livelihood outcomes. Likewise, Tuyen *et al.* (2014) reported positive and significant differences between farmland holding and household livelihood outcomes though not all types of land were associated with household livelihood outcomes. The study noted further that annual and perennial crop land had a positive effect on household livelihood outcomes though the effect was not found to be the case with forest land. These results imply that the effects of land size on household livelihood outcomes depend on the crop that is grown in that land. In order to examine the effects of large-scale agricultural investments based on the gender of the household head, Tuyen (2015) regressed livelihood outcomes in Vietnam on household headship and the results show that gender of the household head does not affect household livelihood outcomes. Aikael (2010) in rural Tanzania found that a livelihood outcome in terms of income was lower in female-headed households than in male-headed households.

From the literature reviewed, it is clear that factors influencing household livelihood outcomes are complex and diverse. The analysis of livelihood outcomes in developing countries must take into account this diversity and context in which large-scale agricultural investments operate. Therefore, context-specific studies are necessary to

contribute to the debate and enhance our understanding of the effects of large-scale agricultural investments and household socio-economic factors on households' livelihood outcomes. Better understanding of the factors affecting households' livelihood outcomes is of much importance, especially when designing policy interventions to improve household welfare. Hence, this study was conducted to fill in this gap in the literature. This paper aim at contributing to the literature on the effects of large-scale agricultural investments on livelihood outcomes by analysing socio-economic characteristics and factors large-scale agricultural investments that influence households' livelihood outcomes. The study was guided by three hypotheses:

- i. Household participation in the out-grower scheme has no impact on household livelihood outcomes in terms of income and asset monetary value.
- ii. Household participation in the investor farm employment does not influence household livelihood outcomes in terms of income and asset monetary value.
- iii. Household socio-economic characteristics do not have any impact on household livelihood outcomes in terms of income and asset monetary value.

2.0 Methodology

The study was conducted in Kilombero Valley in Kilombero District where four villages namely Msolwa Ujamaa, Sanje, Mchombe and Mngeta were purposively selected. The villages were selected due to having a larger number of out-growers and the presence of out-grower association as well as households working for large scale agricultural investments.

A cross-sectional research design was adopted in order to examine household livelihood outcomes in the study area. The sampling unit was a household and exploratory sequential research strategy was adopted in order to integrate the results from two stages so as to

expand the scope and improve the quality of the results (Courtney, 2017). In this strategy, the qualitative data collection and analysis preceded quantitative data collection and analysis. The qualitative phase of data collection involved Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs), which were used to collect information on sources of livelihood and the key factors influencing household livelihood outcomes. A total of seven FGDs with a total of 50 (33 Male and 17 Female) participants were conducted as shown in Table 4.1. Participants ranged from six to eight individuals. The selection of FGDs participants was based on gender and age representation to capture age and gender specific views. Fourteen KIIs were involved including two out-grower association administrative secretaries, three Ward Executive Officers (WEOs), four Village Executive Officers (VEOs), two representatives from Kilombero Plantation Limited (KPL) and Kilombero Sugar Company Limited (KSCL), one representative from Southern Agricultural Growth Corridor of Tanzania (SAGCOT), one representative from Sugar Board of Tanzania and Kilombero District Agricultural, Irrigation and Cooperative Officer (DAICO). The selection of (KIIs) participants was based on age, experiences and position. The aim was to get the oldest members with long experience on out-grower scheme and investor farm employment in the respective villages.

Table 4.1: Information on FGDs and Participants involved

Village name	Number of FGDs conducted	Number of Male Participants	Number of Female Participants	Mean age (years)	Minimum age (years)	Maximum age (years)
Msolwa Ujamaa	3	14	7	42	25	72
Sanje	2	10	5	44	29	61
Mchombe	1	5	3	46	31	66
Mngeta	1	4	2	48	34	70
Total	7	33	17	NA	NA	NA

NOTE: FGDs = Focus Group Discussions; NA = Not Applicable

The quantitative phase of data collection involved household survey whereby 376 households were involved. Proportionate stratified sampling techniques using a household village register was applied to determine a sub-sample from each village. By assuming a 95% confidence level and a precision of 0.05, the required sample size was obtained using the following formula:

$$n = \frac{N}{N(e^2) + 1} \dots\dots\dots \text{(Yamane, 1967 as cited by Israel, 2013)}$$

Where:

n is sample size,

N is the population of all households in study villages and

e is the level of precision.

According to the National Census of 2012, the number of households in the four villages which were to be included in the study is 5914. Using the above formula, a sample of 400 households was obtained for all villages. The formula used for the sample size at specific village (proportionate) was adopted from Kothari (2004) be obtained using the following formula:

$$n = \frac{N(\text{Onevillage}) \times n(\text{allvillages})}{N(\text{Allvillages})} \dots\dots\dots \text{(Kothari, 2004).}$$

Thereafter, a simple random sampling using lottery technique was used to select respondents from each village. The sub-sample from each village is indicated in Table 4.2.

Qualitative data were analysed using content analysis whereby words were transcribed and organized into different themes based on the study objectives. Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS) Statistics, version 20.

Table 4.2: 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
MsolwaUjam aa	1832	78	44	44	31	47	122
Sanje	1146	64	14	41	18	22	76
Total	5914	296	80	85	129	165	400

Descriptive statistics were used to describe household socio-economic characteristics while multiple regressions were used to determine socio-economic and large-scale agricultural investments factors influencing households' livelihood outcomes. The explanatory variables which were entered in the model were those informed by empirical literature review and theoretical review. Before carrying out the analysis, the researcher executed the following: tested the normality using Shapiro-Wilk and thereafter transformed income and value of asset into their natural logarithms. The Collinearity/multicollinearity diagnostics test was done in order to detect whether or not there was a correlation among the independent variables. According to Pallant (2011), the multicollinearity problem is described by the presence of linear or near linear relationship among explanatory variables.

Testing of the model on multicollinearity was done using tolerance and Variance Inflation Factor (VIF) test which builds in the regression of each independent variable. As Pallant (2011) suggests, a tolerance value less than 0.10 and a VIF above 10 indicate multicollinearity. The results show that there were no variables which had VIF 10. This observation confirms that there was no violation of the multicollinearity assumption in this study. In addition, Durbin-Watson's tests were used to test for autocorrelations. The results

show the Durbin-Watson's of 2.043, which fall within the rule of thumb values of $1.5 < d < 2.5$ (Kutner *et al.*, 2005). Hence, there was no auto-correlation in the multiple linear regression data.

The correlation coefficient (R) was 0.624 (Table 5) this means that the independent variables which were used in the regression model collectively were associated with the dependent variable by 62.4%. Equally, the coefficient of determination (R^2) was 0.389, implying that the model was able to explain 38.9% variation in the dependent variable. The R-squared of 0.389 and the adjusted R-squared of 0.371 were consistent with cross-sectional data as reported by Okurut *et al.* (2014). Therefore, the model which was adopted in this paper had the following form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + e$$

Where:

Y = Household livelihood outcomes (Outcome variable).

$\beta_1 \dots \beta_{11}$ = estimation parameters

$X_1 \dots X_{11}$ = explanatory variables defined in Table 4.3.

β_0 = the intercept

e = Regression error term

Table 4.3: Variables entered in the model

Variables	Type of variable	Description of the variable	Expected sign
Livelihood Outcomes (income and asset monetary value)	Continuous	Summation of natural logarithm of income and asset stock	
Age	Continuous	Age of the household head (in years)	+
Household headship	Dummy	Household headship type (1 if headed by male, 0 if otherwise)	+
Marital status	Dummy	Household head marital status (1 if married, 0 if single, separate, widow/widower or divorced)	+
Education	Continuous	Years of schooling of the household head (in years)	+
Household Size	Continuous	Number of individuals in a household	+/-
Land Size	Continuous	Household land size (in ha)	+
Group membership	Dummy	Household group membership (1 if in group membership, 0 otherwise)	+
Household livelihood strategies	Dummy	Livelihood strategies (1 if multiple livelihood sources, 0 if otherwise)	+
Out-grower scheme	Dummy	Household participation in out-grower scheme (1 if household participate, 0 if otherwise)	+
Investor farm wage employment	Dummy	Household participation in investor farm wage employment (1 if household participate, 0 if otherwise)	-
Company adjacent	Dummy	Company adjacent to the household (1 if KSCL, 0 if KPL)	+

Livelihood outcome was measured by aggregating the total household income and the household total asset value as adapted from Wendimu (2015) and expressed as:

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

Where,

LO = Household livelihood outcome, ln = denotes the natural logarithm, HI= Total Household Income and AMV= Household Assets Monetary Value

The total households' income was based on the annual cash earnings of the households from farm income, off-farm income and other sources (i.e. remittances, rental, and pension). The household total asset monetary value was computed by aggregating the market value of all the assets which households owned. The assets included those identified by the households during the pre-testing exercise as proxy indicators of wealth in the study area. They included consumer durable assets such as TV, Sofa sets, satellite dishes, radio, DVD player and cabinets and cellophanes. Others were productive assets such as chemical sprayers, bicycles, motor cycles, hand hoes and machetes. The values of these assets were estimated by inquiring about the quantities held and their market monetary values in 2016.

3.0 Results and Discussion

This section describes household socio-economic characteristics and large-scale agricultural factors that influence household livelihood outcomes.

3.1 Household Socio-economic Characteristics

The results in Table 4.4 show that the minimum age of household head was 18 years while the maximum was 90 years, and the mean age was 42.0 years. This suggests that there was a predominance of mature and productive household heads who could actively engage in different economic activities including participation in the out-grower scheme and in the investor- farm employment. Since the majority of the respondents fell within the middle age, it is an indication that they were within the active working age of the communities.

The mean year of schooling of the household head was 7.0 years with a minimum of zero (0) years of schooling and a maximum of 16 years of schooling (Table 4.4). This implies that a larger percentage of the household heads had at least completed primary education,

and they could be exposed to information that would improve their households' wellbeing and development.

Table 4.4: Households' socio-economic characteristics (n = 376)

Variable	Minimum	Maximum	Mean
Age	18	90	42.5
Year of schooling	0	16	6.6
Land size	0.25	16	2.7
Household size	2	10	4.1

Some few households had education level above primary education. The possible explanation is that the highly educated people tend to shun away from agriculture for white colour jobs, they are more concerned with time value of money and would prefer to invest in projects with quick returns and profitable. Studies by Bahaman *et al.* (2009) revealed that out-grower scheme is among the main choices for those with lower education. This suggests also that there is a higher likelihood of households to effectively use their land for different economic activities including sugarcane outgrowing and hence increase their income. Education is also associated with the production of high quality crops and greater participation in wage employment and in other non-farm activities. Education allows diversification into other more lucrative, income-generating activities.

The mean household size was 4.0 people with a minimum of two (2) household members and a maximum of 10 members of the household (Table 4.4). As reported by URT (2012), the household size in Morogoro is 4.4 people. This implies a sufficient supply of household labour for livelihood activities. And as it has been established, paddy and sugarcane, which are the main crops grown in Kilombero valley, are labour intensive crops.

The minimum land size was 0.25 ha and the maximum was 16 ha with a mean of 2.7 hectares of land (Table 4.4). Households with large productive land size and that grow crops using recommended agronomic practices were expected to have high livelihood outcomes. This is due to the fact such households have more opportunities of acquiring more income due to economies of scale. This increases their wealth unlike their counterparts.

About two-thirds (65%) of the household heads were married. The rest were single, separated, divorced or widowed (Table 4.5). The marital status and stability of the family can have either positive or negative impact on agricultural development. When a family is stable, members can engage effectively in agriculture while when it is unstable due to conflicts, members cannot be engaged effectively in agriculture leading to poor agricultural performance. In addition, marital status has an implication on land ownership as in most cases in African societies; it is only married members who have the right to inherit land. According to Amaza *et al.* (2009), the significance of marital status on agricultural production can be explained in terms of the supply of family labour. Property ownership should be under the head of the households who in most cases are men (Ruheza *et al.*, 2012). The issue of marital status is important in the sense that in the African context married women are less involved than men in issues pertaining to land ownership (Quansah, 2009).

The results also showed that 44.6% of households belonged to group (Table 4.5). Group membership was expected to support household members in accessing training, extension services, credit and agricultural inputs and thus increase crop productivity and eventually livelihood outcomes. The presence of few household members who were in groups implies that households face difficulties in accessing credit, inputs, and extension services.

Table 4.5: Households' socio-economic characteristics (n=376)

Variables	Frequency	Percent
Marital Status		
Married	246	65.4
Otherwise (Single, divorced, separate and widow)	130	34.6
Group Membership	169	44.6
Livelihood Strategies		
Farming only	168	44.3
Off-farming only	44	11.6
Both farming and off-farming	164	43.3
Out-grower	85	22.6
Investor farm workers	129	34.3

Household heads who reported farming activities their only main source of income were 44.3%. Additionally, 43.3% of the households were combining farming and off-farming activities (Table 4.5). This implies that a large proportion of households in Kilombero Valley did farming or combined farming and non/off-farm income generating activities. The KIIs participants emphasized that large-scale agricultural investment has stimulated business and other off-farming activities such as agricultural input supplies and food vending. This can be due to the fact that relying on different sources of income spreads the risks and thus raises the chances of creating household wealth. Households participating in out-grower scheme and in the investor farm wage employment were 22.6% and 34.3% respectively.

3.2 Factors Influencing Household Livelihood Outcome

The results showed that age, livelihood diversification strategies, years of schooling, household size, group membership, participation in out-grower scheme, and land size were found to be important determinants in influencing household livelihood outcomes in the study area (Table 4.6).

Table 4.6: Factors influencing household livelihood outcome

Model	Unstandardized Coefficients	Standard Coefficients	T	Sig.	Collinearity Statistics	
	B	Std.Error	Beta		Tolerance	VIF
(Constant)	14.158	0.551		25.686	0.000	
Age	0.015*	0.005	0.176	3.124	0.002	1.891
Marital status	-0.170	0.124	-	-1.371	0.171	1.268
			0.063			
Household headship	0.079	0.142	0.025	0.556	0.578	1.215
Education	0.067*	0.022	0.151	3.051	0.002	1.455
Household size	0.107*	0.032	0.164	3.375	0.001	1.408
Group membership	0.340*	0.118	0.132	2.880	0.004	1.243
Livelihood strategies	0.158*	0.066	0.116	2.405	0.017	1.376
Land size	0.118*	0.019	0.291	6.117	0.000	1.353
Out-grower scheme	-0.655*	0.170	-	-3.848	0.000	1.826
			0.213			
Investor farm employment	0.264	0.138	0.099	1.914	0.056	1.583
Company adjacent	0.117	0.132	0.046	0.886	0.376	1.574

R = 0.624, R² = 0.389, Adjusted R² = 0.371, t = 25.686, Durbin-Watson = 2.043, F = 21.073, (p=0.000).
Dependent Variable: Livelihood outcomes. * Significant at 5% level

The results revealed that participation in out-grower schemes had a negative and significant influence on household livelihood outcome at 5% level of significance (Table 4.6). This implies that the higher the household participation in out-grower schemes the lower the livelihood outcome. This is partly attributed by low sucrose level and deductions made to out-growers which lower the income they receive from selling sugarcane hence reducing their livelihood outcome. This finding is in line with what is reported in FGDs in Sanje village that:

“... *Out-grower scheme is not paying at all since we experience low sucrose level and there are a lot of deductions during payments for the sugarcane sold. We are forced to continue growing sugarcane because it is not practical to grow other crops like rice and maize that provide nesting sites for crop eating birds in addition to risk of fire...*” (FGDs in Sanje Village).

The finding in the above extract implies that if households that were participating in out-grower scheme had an alternative to sugarcane they could have shifted to crops such as maize or paddy. During KIIs, a similar observation was made that out-grower schemes practices in Kilombero valley had made it impractical and risk to grow food crops on the land surrounded by sugarcane farms. During KIIs, some households were reported to have been looking for extra land in faraway villages to grow maize and paddy in order to supplement household income which was received from sugarcane selling. Studies by Sokchea and Culas (2015); Wendimu (2015); Glove and Jones (2016); Bergius *et al.* (2017) and Sulle (2017) and reported that out-grower livelihood outcomes are negatively affected by large-scale agricultural investments. Smalley *et al.* (2014) reported further that households participating in out-grower schemes are marginalized and negatively affected by large-scale agricultural investments due to delays in payment, sugarcane remaining unharvested, low sucrose level and high deductions which take a large proportion of out-growers income and thus reducing their livelihood outcome.

Age of the household head showed a positive significant influence on livelihood outcomes at 5% level of significance (Table 4.6). Keeping other factors constant, the livelihood outcomes increased by a factor of 0.015 when the age of the household head increased by one year. This suggests that the higher the age of the household head the higher the households' livelihood outcomes. The possible explanation for this is that older households may have access to land and have wealth of experiences that, if well exploited, can improve their livelihood outcomes. During FGDs in Msolwa Ujamaa village, it was reported that:

“... *Most of young household heads lack land that can be used to grow different crops and therefore they rely on wage employment which attracts low wages...*” (FGDs in Msolwa Ujamaa Village).

This finding emphasizes that the youth are still facing some difficulties in securing livelihoods in land related activities. As reported by Herrmann (2017), older household heads are more likely to enjoy the benefits accrued from their participation in large-scale agricultural investments. Empirical evidence shows further that the age of the household members might be ambiguous. Households with younger working members are more likely to undertake non-farm jobs, which in turn might increase household livelihood outcomes. Nevertheless, households with older working members tend to attain more work experience, which might enable the households to earn higher livelihood outcomes (Tuyen *et al.*, 2014). Also Girei and Giroh (2012) affirm that the level of involvement in farming tends to increase with the attainment of optimum age group and starts to decrease with an increase in age.

In addition, the results showed that household group membership positively and significantly influence household livelihood outcomes at 5% level of significance (Table 4.6). If other factors remain constant, the livelihood outcomes among households in groups were 0.340 times higher than those not in groups. The possible explanation for the positive coefficient is that households with a membership in group/groups are more likely to achieve higher livelihood outcomes. This was expected since household participation in groups minimizes households' financial constraints; hence, the households will have the opportunity of financing their farming and other income generating activities. Group membership can also increase household social capital and entrepreneur skills. In addition, being a member of social groups can increase the bargaining power of farming households

in selling their produce due to collective actions and decisions. These results are in line with the qualitative results quoted as follows:

“...Group participation has been of help to us in terms of credit schemes; agricultural inputs like seeds and fertilizers are channelled to groups by KPL in collaboration with National Microfinance Bank (NMB) and YARA...” (FGDs in Mngeta Village).

This finding implies that those households participating in social groups are in a position to improve their agricultural production and other economic activities which, as a result, can improve livelihood outcomes. According to Bahaman's *et al.* (2008) study results in Malaysia, social capital is a very important asset in improving household livelihood outcomes as most of the credit schemes are channelled through groups.

Household size showed positive and significant influence on the household livelihood outcome at 5% level of significance (Table 4.6). The positive sign indicates that the livelihood outcome increases with an increase in the household size. The coefficient of 0.109 for household size implies that, other factors being constant, the livelihood outcome increases by one unit as the household size increases by 0.109. Household size has an implication on family labour supply and livelihood outcomes. Having a large household size is an important asset in working together in the household economic activities. This implies that households with large household sizes have enough labour that can be expended in agricultural activities and other income generating activities. These results are support by findings of Narayan's (2010) study in southern India that revealed that households with large sizes have higher chances of getting higher livelihood outcome because they have more labour for farming activities. However, this is often the case where almost all members of the household take part in production and or services

provision to contribute to the economy of the household (Kayunze, 2000). On the other hand, some previous empirical evidence has revealed different results, that large household size implies more mouths to feed and more family obligations that reduce the ability of the household to improve livelihood outcomes. For example, a study by Okurut *et al.* (2014) in Botswana reported that the bigger the household size the poorer the household becomes, and thus lowering their chances of improving their livelihood outcomes.

Likewise, livelihood strategies influenced positively and significantly livelihood outcomes at 5% level of significance (Table 4.6). The possible explanation for this is that households that have diverse sources of livelihood have higher chances of being better off in terms of livelihood outcomes. This is expected since diversification allows households to spread the risks. FGDs shared a similar view in the extract below:

“...Most of us combine farming with other non-farming income generating activities in order to avoid risks inherent in participating in farming only...”
(FGDs in Mchombe Village).

The finding in the extract above implies that households in the study area are aware of the risks that can result from depending on only one source of income. Similar results are reported by Hakizimana *et al.* (2017) in Kenya and Yaro *et al.* (2017) in Ghana who revealed that households in communities with large-scale agricultural investments tend to diversify livelihood sources, between on-farm and off-farm sources and this result in better livelihood outcomes.

Education showed positive and significant influence on the livelihood outcome at 5% level of significance (Table 4.6). The possible explanation is that literate household heads

have better skills, better access to information and ability to process information. It also implies that literate household heads are more likely to be employed in formal employments which attract higher pay, and hence improving livelihood outcome. The results imply further that the majority of household heads were literate enough to adopt and use out-grower scheme services from out-grower associations as well as from the investors. Highly educated households are also expected to be better off in terms of livelihood outcomes than those with low formal education. Low education level can lower households' efforts of improving their livelihood outcomes. Similar results are reported by Herrmann (2017) who revealed that highly educated household members have alternative sources of income and hence are less inclined to own and/or cultivate land but instead rely on wage employment in some of large-scale agricultural investments hence high livelihood outcomes. This is further supported by the previous studies such as the one by Amrouk *et al.* (2012) in Ethiopia and Tanzania and Casaburi *et al.* (2012) in Western Kenya who established that education level has a positive implication on household livelihood outcomes.

Similarly, household land size owned showed positive and significant influence on household livelihood outcomes at 5% level of significance (Table 4.6). This implies that as land size gets larger, the livelihood outcomes also increase. This has an implication on the ability of the households to combine different farming systems and thus grow varieties of crops. It also implies that households with large arable land sizes have the opportunity of growing large tracks of paddy or sugarcane. Large land size also implies that households can diversify into other crops and reduce the risks inherent in agricultural production. Previous studies have shown that owing to low farming technology, household livelihood outcomes, to a large extent has to depend on land size cultivated (Waswa *et al.*, 2012; Amrouk *et al.* (2012). However, Tuyen *et al.* (2014) study in

Vietnam warns that not all types of land can result into higher household livelihood outcomes. The livelihood outcomes, according to Tuyen *et al.* (2014), depend on the type of the crop grown on the land and on the use of recommended agricultural practices.

Based on this result the null hypothesis that households' participation in the out-grower scheme has no impact on household livelihood outcomes in terms of income and asset monetary value is rejected. The null hypothesis that households' participation in the investor farm employment does not have significant influence on household livelihood outcomes is accepted. Likewise, the null hypothesis that households' socio-economic characteristics do not have impact on livelihood outcomes is rejected.

4.0 Conclusions and Policy Recommendations

The study concludes that the factors influencing households livelihood outcomes are diverse, ranging from socio-economic characteristics to large-scale agricultural investment factors. Household participation in the out-grower schemes in the study area decreased their chances of improving their livelihood outcomes. The households' participation in the investor farm wage employment does not influence livelihood outcomes. It is also concluded that, household socio-economic characteristics such as age, education, household size, land size, group membership and livelihood strategies are helpful in improving households' livelihood outcomes. This conclusion agrees with the theoretical underpinning adopted from SLF that some socio-economic characteristics and households' participation in the out-grower scheme influence livelihood outcomes. However, the study disagrees with the view in the theoretical framework that gender variables such as marital status and sex have some influence on households' livelihood outcomes. The study also disagrees with the theoretical view that households' participation in the investor farm wage employment influences livelihood outcomes.

The paper recommends that in seeking to improve households' livelihood outcomes, the existing out-grower associations in the study area in collaboration with Sugar Board of Tanzania (SBT) should devise plans of raising household's livelihood outcomes through ensuring a win-win situation in the contracts between large-scale agriculture investors and out-growers. It is also recommended that Local Government Authorities in collaboration with Community based organizations in the study area should encourage households into joining the groups by creating awareness on the importance of group membership. Tanzania Government is advised to promote diversification of livelihood strategies into both agriculture and rural non-farm economic activities through greater investment in education and labour skills training to equip households with knowledge and skills of securing good livelihood outcomes in the study area and in other area with similar situations. There is a need for the Local Government Authorities in collaboration with the Central Government to ensure that households in the villages with sugarcane production have more access to land in order to allow them to cultivate other crops such as maize and paddy. Further research based on repeated surveys would be required to look into long-term impacts of large-scale agricultural investments on household livelihood security.

References

- Aikaeli, J. (2010). Determinants of Rural Income in Tanzania: An Empirical Approach, Research on Poverty Alleviation (REPOA), Research Report 10/4, Dar es Salaam, REPOA, 26pp.
- Amaza, P. S., Abdoulaye, T., Kwaghe, P. and Tegbaru, A. (2009). *Changes in household food security and poverty status in PROSAB area of Southern*; International Institute of Tropical Agriculture, Ibadan, Nigeria Borno State, Nigeria. 40 pp.

- Amrouk, E., Rakotoarisoa, A.M. and Chang, K. (2013). *Structural Changes in the Sugarcane Market and Implications for Sugarcane Smallholders in Developing Countries: Countries Case Studies for Ethiopia and United Republic of Tanzania*. Trade and Markets Division, Food and Agriculture Organization, United States of America. 52pp.
- Arndt, C., Benfica, R. and Tarp, F. (2010). Biofuels, poverty, and growth: a computable general equilibrium analysis of Mozambique. *Environment and Development Economics* 15(1): 81-105.
- Bahaman, A.S., Hayrol, M.S., Azril, M.H., Salleh A.H. and Narimah, I. (2009.) ICT contribution in increasing agro-based entrepreneurs' productivity in Malaysia. *Agriculture Extension and Social Sciences* 5(3): 93-98.
- Barrett, C. B., Bachke, M. E., Bellemare, M. F., Michelso, H. C., Narayanan, S. and Walker, T.F. (2012). Smallholder participation in contract farming: comparative evidence from five countries. *World Development* 40 (4): 715–30.
- Baumgartner, P., von Braun, J., Abebaw, D. and Müller, M. (2015). Impacts of large-scale land investments on income, prices and employment: empirical analyses in Ethiopia. *World Development* 72: 175–190.
- Bellemare, M. F. (2012). As You Sow, So Shall You Reap: The welfare impacts of contract farming. *World Development* 40 (7): 1418-1434.

- Bergius, M., Benjaminsen, T.A. and Widgren, M. (2017). Green Economy, Scandinavia Investment and Agricultural modernization in Tanzania, *Peasant Studies*. Retrieved from [dox.doi.org/1080/03066150. 2016. 1260554] site visited on 28/11/ 2017.
- Borras Jr, S.M., Hall, R., Scoones, I., White, B. and Wolford, W. (2011). Towards a better understanding of global land grabbing: an editorial introduction. *Journal of Peasant Studies* 38(2): 209 – 216.
- Casaburi, L., Kremer, M. and Mullainathan, S. (2012). *Contract Farming and Agricultural Productivity in Western Kenya*. Harvard University. 50pp.
- Cotula, L. (2012). The international political economy of the global land rush: A critical appraisal of trends, scale, geography and drivers. *Journal of Peasant Studies* 39(4): 649 – 680.
- Courtney, A.M. (2017). The Value of Mixed Methods Research: A Mixed Methods Study. *Journal of Mixed Methods Research* 11(2):202-222.
- Davis, B., Winters, P., Carletto, G., Covarrubias, K., Quinones, E., Zezza, A., Stamoulis, K., Azzarri, C. and DiGiuseppe, S. (2010). Cross-country comparison of rural income generating activities. *World Development* 38 (1): 48–63.
- Deininger, K. (2011). Challenges posed by the new wave of farmland investment. *Journal of Peasant Studies* 38(2): 217–247.

- Deininger, K. and Byerlee, D. (2012). The rise of large farms in land abundant countries: do they have a future? *World Development* 40(4): 701–714.
- Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics* 52: 289 – 302.
- FAO (2012). Impact of foreign agricultural investments on developing countries: evidence from case studies. Retrieved from [<http://www.fao.org/economic/est/issues/investments>] site visited on 14/4/2016.
- Gibbon, P. (2011). Experiences of Plantation and Large-Scale Farming in 20th Century Africa. *DIIS working paper: 20*. Retrieved from [<http://www.diis.dk/sw112603>]. Site visited on 26/10/2016.
- Girei, A.A. and Giroh, Y.D. (2012). Analysis of the factors affecting sugarcane (*saccharumofficinarum*) production under the out-growers scheme in human local government area Adamawa State, Nigeria. *Advances in Agriculture, Sciences and Engineering Research Journal* 2(5): 1158-1164.
- Glover, S. and Jones, S. (2016). *Can Commercial Farming Promote Rural Dynamism in Sub-Saharan Africa?*, World Institute for Development Economics Research (WIDER) Working Paper 120, 21pp.
- Hakizimana, C., Goldsmith, P., Nunow, A. A., Roba, A.W. and Biashara, J. K. (2017). Land and agricultural commercialisation in Meru County, Kenya: Evidence from three models, *Peasant Studies* 44 (3): 555-573.

- Herrmann, R. and Grote, U. (2015). Large-scale agro-industrial investments and rural poverty: Evidence from sugarcane in Malawi. *Journal of African Economies* 24(5): 645-676.
- Herrmann, R.T. (2017). Large-scale agricultural investments and smallholder welfare: A comparison of wage labour and out grower channels in Tanzania. *World Development* 90: 294-310.
- Israel, D.G. (2013). *Determining Sample Size*. University of Florida, IFAS Extension, PEOD6, United States of America, 5pp.
- Jansen, H., Pender, J., Damon, A., Wielemaker, W. and Schipper, R. (2014). "Policies for sustainable development in the hillside areas of Honduras: A quantitative livelihoods approach", *Agricultural Economics* 34(2): 141-153.
- Kayunze, K.A. (2000). poverty disparities in small, large, male and female-headed households in rural Tanzania: a case study of Mbeya region. *Tanzania Journal of Population Studies and Development* 7(1 and 2): 1-16.
- Kothari, C. (2004). *Research Methodology; Methods and Techniques*. New Age International Limited Publishers. New Delhi. 401pp.
- Kutner, M. H., Nachtsheim, C.J., Neter, J. and Li, W. (2005). *Applied Linear Statistical Models. 5th ed.* McGraw, Hill. New York. 1396pp.

- Matondi, P.B., Havnevik, K. and Beyene, A. (2011). Conclusion: Land grabbing, smallholder farmers and the meaning of agro-investor-driven agrarian change in Africa. In *Biofuels, land grabbing and food security in Africa*. (Edited by Matondi, P.B., Havnevik, K., Beyene, A.) Zed Book, London. pp. 176–195.
- Narayan, S. (2010). Contract farming as frictional equilibrium: A theoretical viewpoint with empirical evidence from Southern India. *Sustainable Development* 9(2): 2016-244.
- Narayanan, S. (2014). Profits from participation in high value agriculture: Evidence of heterogeneous benefits in contract farming schemes in Southern India. *Food Policy* 44: 142-157.
- Pallant, Y. (2011). SPSS Survival Manual. [www.allenandunwin.com/spss]. Site visited on 11/12/2016).
- Ruheza, S. G., Muhamba, G. T., Mbwambo, J. S., Khamis, Z. K., Swella, G., Deus, K. and Mushobozy, D. K. (2012). Studies on the influence of tree tenure on the adoption of agroforestry practices in Uluguru Mountains, Tanzania. *International Research Journal of Agricultural Science and Soil Science* 2(5): 170-178.
- Okurut, M.F., Kagiso, M., Ama, O.N. and Okurut, L.M. (2014). Impacts of microfinance on household welfare in Botswana, *Botswana Journal of Economics* 12(1): 45-58.

- Otsuka, K. and Yamano, T. (2006). "Introduction to the special issue on the role of nonfarm income in reduction: Evidence from Asia and East Africa", *Agricultural Economics* 35(3): 393-397.
- Oya, C. (2013). "The land rush and classic agrarian questions of capital and labour: a systematic scoping review of the socioeconomic impact of land grabs in Africa", *Third World Quarterly* 34(9): 1532-1557.
- Quansah, E.S.T. (2012). Land tenure systems; Women's Access to land in a Cosmopolitan Context. *African Studies* 9: 141-162. [<http://dx.doi.org/10.4314/og.V9i1.8>] site visited on 16/5/2017.
- Tuyen, T. Q., Lim, S., Cameron, M. and Huong V.V. (2014). "Farmland loss and livelihood outcomes: A Microeconometric Analysis of Household Surveys in Vietnam", *Asia Pacific Economy* 19(3): 423-444.
- Tuyen, T.Q. (2015). Socio-economic determinants of household income among ethnic minorities in the North-west Mountains, Vietnam, *Croatian Economic Survey* 17(1): 139-159.
- URT (2012). *National consumer price index (NCPI) for December 2012*: National Bureau of Statistics, Ministry of Finance Dar es Salaam, Tanzania. 5pp.
- Scoones, I. (1998). Sustainable rural livelihoods: A framework for analysis. [<http://200.17.236.243/pers/agroecologia/sustainable%20rural%20livelihoods-scoones.pdf>] site visited on 7/2/2016.

- Smalley, R., Sulle, E. and Malale, L. (2014). *The Role of State and Foreign Capital in Agricultural Commercialization: The Case of Sugarcane Out-growers in Kilombero District, Tanzania*, Future Agricultures, Working Paper No. 106, 38pp.
- Sokchea, A. and Culas, R.J. (2015). Impact of contract farming with farmer organizations on farmer's income: A case study of reasmey stung senagricuktural development cooperative in Cambodia, *Australasian Agribusiness Review* 23(1): 1-11.
- Sulle, E. (2017). social differentiation and the politics of land: Sugar cane outgrowing in Kilombero, Tanzania, *Southern African Studies* 43(3): 517-533.
- Waswa, F., Gwenyi-Onyango, P.J. and Mcharo, M. (2012). Contract sugarcane farming and farmer's income in large Victoria Basin, Kenya, *Applied Biosciences* 52: 3685-3695.
- Wendimu, M.A. (2015). *Large-scale Agriculture and Out-grower Schemes in Ethiopia: Land Acquisition, Productivity, Labour Markets and Welfare Effects*, PhD Thesis for Partial Fulfilment of PhD School of the Faculty of Science University of Copenhagen, 190pp.
- Wendimu, M.A., Henningsen, A. and Gibbon, P. (2016). Sugarcane out-growers in Ethiopia: "Forced" to remain poor? *World Development* 83: 84-97.

Yaro, J.A., Teye, J.K. and Torvikey, G.D. (2017). Agricultural commercialisation models, agrarian dynamics and local development in Ghana. *Peasant Studies* 44(3): 538-554.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Major Results and Conclusions

5.1.1 Opportunities and constraints of large-scale agricultural investments

The association between opportunities and constraints of out-grower scheme and investor farm employment are examined in Chapter Two. This covered the first objective of this study. Opportunities for households' participating in out-grower scheme were clearly associated with household headship and these opportunities were skewed to MHHs. This reject the null hypothesis set earlier (sections 1.5.2) on the association between out-growers opportunities and household headship. This is the case because one of the conditions of joining out-grower scheme is land ownership, which in most cases is the domain of men. This means that the measures of bringing about equitable benefits for both MHHs and FHHs participating in the out-grower schemes need to be gender sensitive to have a meaningful outcome. As hypothesized earlier (section 1.5.2), MHHs and FHHs participating in the out-grower schemes and in the investor farm employment experience the same constraints. These constraints have policy implications that call for concerted efforts of development actors into addressing the situation.

5.1.2 Livelihood outcomes among households participating in large-scale agricultural investments

The comparison of livelihood outcomes among households participating in the out-grower schemes and in the investor farm employment as well as the comparison of livelihood outcomes among MHHs and FHHs are discussed in Chapter Two to address the third objective. Contrary to what was hypothesized earlier (section 1.5.2); households participating in the out-grower schemes derived more benefits from large-scale

agricultural investments as compared to households' participating in the investor farm employment and to non-participants. This is due to the fact that households participating in the out-grower schemes are assured of the market of their produce as well as access to agricultural inputs which are channelled through their associations. Furthermore, the livelihood outcomes among MHHs and FHHs revealed a gender differential whereby MHHs derived more benefits from their engagement in large-scale agricultural investments by enjoying more benefits in the out-grower schemes and in the investor farm employment. This was contrary to what was hypothesized earlier (section 1.5.2). This underscores the importance of gender sensitive strategies in the efforts of improving livelihood outcomes.

5.1.3 Determinants of households participation in the out-grower scheme and investor farm employment

The determinants of households' participation in the out-grower scheme and in the investor farm employment are discussed in Chapter Three in addressing the second objective of the study. Households' participation in the out-grower scheme is determined by households' gender variables and by some other socio-economic characteristics. This rejects the null hypothesis stated earlier and this means that in order to increase the chances of the household to participate in the out-grower scheme, gender sensitive strategies that take into consideration age and sex of the household head are necessary.

In addition, this calls for good strategies of increasing households' participation in the out-grower schemes and target at eliminating socio-economic constraints that hinder households' participation in the out-growers scheme and improve those that enhance participation. The study findings are in contrast to what was hypothesized, and revealed clearly that households' participation in the investor farm employment is determined by

households' gender variables and by some other socio-economic characteristics. This implies that gender sensitive strategies that take into consideration age, sex, and marital status of the household head are required in order to have equitable chances for households of different age groups, headship and different marital status to participate in the investor farm employment. It is also important to point out that households' participation in the investor farm employment is skewed toward household with low income and low asset stocks. This means that, investor farm employment is the alternative source of income for households lacking other income sources.

5.1.4 Determinants of households livelihood outcomes

The influence of household socio-economic characteristics and large-scale agricultural investments factors on household livelihood outcomes is discussed in Chapter Four to address the fourth objective. The Chapter presents the findings in view of the sustainable livelihood framework, which emphasises on having some understanding of the important assets in the context of large-scale agricultural investments and how they influence households' livelihood outcomes. The Chapter tested the hypothesis that household socio-economic characteristics and large-scale agricultural investment factors have no influence on the livelihood outcomes. The hypothesis was rejected as many of the socio-economic variables contribute substantially to improving households' livelihood outcomes. This means that households differ in their socio-economic and demographic characteristics, which in turn, influence personal livelihood outcomes. This has also an implication in that the strategy of improving household livelihood outcomes need to take into consideration the reality that households are heterogeneous in terms of human capital variables, age group, social networks, household size, livelihood sources and land size. Consequently, households' engagement in the out-grower scheme reduces the ability of the household to improve their livelihood outcomes. This is partly contributed to the constraints that

households' participating in the out-grower scheme face. Given the low wages for the investor farm labourers and the constraints which households participating in the out-grower scheme face resulting into low livelihood outcomes, large-scale agricultural investments do not appear to be a promising development strategy in Kilombero Valley at least in the short-run.

5.1.5 Summary of theoretical results

In this study, the SLF was used to explain what impact households' socio-economic characteristics and large-scale agricultural investments have on livelihood outcomes. In addition, SLF was used to understand socio-economic characteristics that enhance or hinder household's participation in the out-grower schemes and in the investor farm employment. The study also used FPE to explain the gendered implications of large-scale agricultural investments on livelihood outcomes.

From SLF perspective, a way to improve household livelihood outcomes of poor people is built around understanding of five principal categories of assets which is a combination of assets of various kinds and not just from one category. In view of SLF perspective, it was essential in this study to understand important livelihood assets that can have an impact on the livelihood outcomes in the context of large-scale agricultural investments in the study area. The study demonstrates that livelihood assets are important in influencing the ability of the households to improve their livelihood outcomes. Therefore, SLF theoretical claim that socio-demographic characteristics and livelihood assets are very important for households participating in large-scale agricultural investments to attain high livelihood outcomes has been ascertained. The FPE theory, on the other hand, postulates that livelihoods in the agrarian political economy are gendered in their organisation, processes and their outcomes. Gendered inequalities, as a result of large-scale agricultural

investments, are rooted in gender differences in the opportunities, constraints and capabilities that hinder FHHs from participating in large-scale agricultural investments and improve their livelihood outcomes. This study illuminates an analytical gap on gendered effects of large-scale agricultural investments. The conceptual framework that incorporates gender variables as employed closed this gap. In order to capture gender aspects, the association between large-scale agricultural investment opportunities and constraints and household headship was established by segregating opportunities and constraints by household headship and by comparing the livelihood outcomes among MHHs and FHHs. The study affirms that households' participation in the out-grower schemes and in the investor farm employment favours MHH. Thus, the FPE theoretical claim that the impact of large-scale agricultural investments for participating households is depending on household headship was affirmed to be practically true in the study context. Contrary to the FPE theoretical claim that MHHs and FHHs participating in the out-grower and in the investor farm employment differs in terms of constraints, this study refuted the claim.

5.2 Recommendations

5.2.1 Addressing the constraints of large-scale agricultural investments for participating households

It is imperative for development practitioners in large-scale agricultural investments to understand gender constraints that hinder household participation in the out-grower schemes and in the investor farm employment in order to design strategies of overcoming these constraints. The constraints for households participating in the out-grower schemes can be solved by ensuring that the out-growers are represented in every decision that affects their payments from sugarcane sales, especially in weighing and measuring sugarcane sucrose level. The local government authorities in Kilombero District should

facilitate frequent meetings between out-grower associations and investors in order to discuss issues emerging from their contract and come up with solutions to the constraints that are within their capacity. Large-scale agricultural investors in collaboration with Local Government Authorities should promote out-grower scheme as this model has proven to provide a better livelihood option than the investor farm employment for the participating households. KSCL should be encouraged to increase the capacity for crushing sugarcane in order to enable more out-growers to sell their sugarcane.

5.2.2 Increasing participation of FHHs in the out-grower scheme

In order to bring equitable opportunities among households of participating in the out-grower schemes the study recommend the Local Government Authorities in the area should embark on promoting out-grower schemes in addressing gender differentials in access and ownership of sugarcane plots by ensuring that Village Land Act 1999 that offers equal opportunities for men and women to own land is enforced. Non-governmental organizations may increase their efforts to lobby for equal rights in land ownership by creating awareness on equitable land redistribution. Local Government Authority in the study area, in collaboration with investors should ensure that wages received by household participating in the investor farm employment is raised at least to a minimum wage level of 310 000 TAS in order to attract more households into benefitting from employment created by large-scale agricultural investments.

5.2.3 Addressing livelihood outcomes disparities between MHHs and FHHs

In order to bring equity between MHHs and FHHs participating in large-scale agricultural investments, in terms of livelihood outcomes, Local Government Authority and non-governmental organization should promote gender dialogues in the community with a view of changing gender norms that discriminate against FHHs from participating in the

out-grower schemes as well as promoting FHHs ownership of productive assets including land.

5.2.4 Improving household livelihood outcomes

In seeking to improve households' livelihood outcomes the existing out-grower associations in the study area, in collaboration with investors should set up plans of raising households' livelihood outcomes through ensuring a win-win situation in the contracts between large-scale agriculture investors and out-growers. The study also recommends that Local Government Authorities in collaboration with Community Based Organizations in the study area should encourage households into joining groups and promote diversification of livelihood strategies in both agriculture and rural non-farm economic activities through more investments in education and labour skills training to equip households with knowledge and skills of securing good livelihood outcomes in the study area and in other areas with households in similar situations. Due to the reality that households are not homogeneous, the efforts made by development actors including the Government should focus on promoting households' livelihood outcomes with particular emphasis on improving household education level, enhancing land ownership, encouraging social networks in rural areas and promoting livelihood diversification strategies.

5.3 Contribution of the study to the Body of Knowledge

This study contributes in the existing literature that the effects of large-scale agricultural investments on households' livelihood outcomes in Kilombero Valley are gendered and vary across investor farming models. The study attempted also to contribute towards the knowledge gap that participation of households in out-grower schemes and investor farm employment is empirically proved to vary by households' socio-economic characteristics. In addition, this study contributes to the existing literature that households' socio-economic characteristics proved to have an influence on livelihood outcomes. Lastly, this study contributes to the existing literature that households' participation in out-grower scheme proved to reduce ability of the household to improve their livelihood outcomes.

5.4 Suggested Areas for Further Research

The assessment of paddy out-grower scheme and its gendered implication for household livelihood outcomes was initially intended to be analysed in this study, but during data collection it was realised that, paddy out-grower scheme was still in a pilot stage and, as a result this, the analysis could not be carried out. This study still finds it important that the comparison of livelihood outcomes among MHHS and FHHs participating in paddy out-grower scheme and sugarcane out-grower scheme be carried in the near future when paddy out-grower scheme is in full operational. The findings of this study could have provided empirical evidence on which schemes are contributing more to the improvement of livelihood outcomes.

It is important to recognize the limitations of the present study in informing policy making. The principal one is that the papers which form this thesis are all based on cross-sectional data, which has its own limitations. For instance, the use of panel data from before and after the intervention would have allowed the examination of the effects of

large-scale agricultural investments on household income and asset stock, thus generating results with a higher degree of internal validity. However, given that no data from before the interventions was available for any variables studied in this case, this limitation was unavoidable. Thus, further research, subject to the availability of times series and panel data, would be required to look into long-term impacts of large-scale agricultural investments on household livelihood security. These studies should consider the heterogeneity that encompasses the age, household headship and marital status of participating households.

APPENDICES

Appendix 1: A copy of household questionnaire used in the research

SOKOINE UNIVERSITY OF AGRICULTURE



COLLEGE OF SOCIAL SCIENCES AND HUMANITIES
DEPARTMENT OF DEVELOPMENT STUDIES, P. O. BOX 3024, MOROGORO

A Household Questionnaire for a PhD Research on

Socio-economic determinants of households' participation in large-scale agricultural investments and its effects on household livelihood outcomes in Kilombero valley

By

Elimeleck Parmena Akyoo, PhD Student

My name is Elimeleck Parmena Akyoo, a PhD student at Sokoine University of Agriculture, Morogoro, Tanzania. This interview is part of a study on “**Socio-economic determinants of households' participation in large-scale agricultural investments and its effects on household livelihood outcomes in Kilombero valley, Tanzania**”. I would like to ask you some questions related to large-scale agriculture investment and its effects on smallholder farmers' livelihood. The interview will take about 35 minutes. The information you give will be confidential and only used for the purpose of this PhD research study. Therefore, please be free to give me your views and opinions truthfully.

A. PRELIMINARY INFORMATION

S/No.	Item	Details / Responses
	Date of Interview	
	Name of Interviewer	
1.	Ward Name	
2.	Village Name	
3.	Hamlet Name	
4.	Respondent's Mobile Phone (Optional)	
5.	Company adjacent (1=KSCL, 0=KPL	

B. HOUSEHOLD CHARACTERISTICS

6. Household profile

Member	Sex	Age in Years	Marital status	Education level	Occupation
B1 H/head					
B2					
B3					
B4					
B5					
B6					
B7					
B8					
B9					
B10					

KEY TO QUESTION 6

Sex:: 1= Male, 2= Female

Marital status: 1= Single, 2= Married, 3= Divorced, 4= Separated, 5= Widow/Widower

Formal education level: 1= None, 2= Primary, 3= Secondary, 4= High school, 5= Vocational, 6= Non-degree qualification, 8= University degree

Occupation: 1=Farming, 2= Investor farm worker, 3= Self-employed off-farm, 4= Farm worker in other farmers farm, 5= Off-farm worker, 6= Housekeeping, 7= Other (Specify) -

7. Years of schooling.....
8. Household size.....
9. Where was the household head born? 1. This village, 2. Another village in the same district, 3. At different region.
10. Where was the spouse born? 1. This village, 2. Another village in the same district, 3. At different region.
11. If born (head) elsewhere when did you settle in this village? Mention year.....
12. Are you or your spouse a member of any social organization? E.g. SACCOS, credit and saving, farm cooperative society, VICOBA, 1. Yes, 2. No.

13. Which type of these organizations are you a member? 1. VICOBA, 2. Farmer cooperative (mention)..... 3. SACCOs, 4. Others (specify)
14. Has the household head received loan in the last 12 months. 1. Yes, 2. No.
15. Where has the loan been obtained from? 1. Close relative, 2. Rotating fund groups, 3. Bank or SACCOs i.e. FINCA, 3. Other (specify)
16. What was the loan for? Explain.....
17. What was the amount of loan received in TZS.....
18. Has you or any household member received any formal training after schooling? 1. Yes, 2. No.
19. What type of the training have you attended? 1. Entrepreneurship, 2. Agricultural skills, 3. Vocational training, 4. Other (specify)
20. What is the ownership status of the house you are living in? 1. Rented, 2. Family house, 3. Government free house, 4. Inherited house, 5. Others (specify)
21. What is the frequency of extension contact a farmer had with extension agent in the past 12 months.....
22. How many years have you been in farming?.....
23. How far is the investor farm from the dwelling?.....km
24. What is the distance to the nearest market
25. How much did you save in the past 12 months.....TAS

C. OPPORTUNITIES AND CONSTRAINTS OF LARGE-SCALE AGRICULTURE INVESTMENT FOR PARTICIPATING HOUSEHOLDS

26. Do you engage in out-growing? 1 =Yes, 0 = No (*If yes go to Qn 27. If no go to Qn. 28*)
27. Which factors have most contributed to your engagement in out-growers scheme?

Variable	Response (Yes =1, No = 0)	
Access to credit		
Access to extension services		
Access to market for agricultural produce		
Increased income from out-growers and wage employment		
Training on proper agronomy practices		
Access to agricultural inputs		
Increasing contact with extension agent		
Expectation of getting higher income		

28. Reasons for not participating in out-growers scheme

Variable	Response (Yes=1, No =0)	
Lack of capital		
Lack of land		
Lack of enough family labour		
Requirements to join out-growers association and register to Sugar Board of Tanzania		
Declining sugar profitability		
Lack of start- up capital to acquire inputs as well as paying small association fees		
Delay in payments for cane sold to the company		
Others (Specify)		

29. What opportunities does your household get by engaging in out-growers scheme?
(Multiple responses)

Variable	Tick the experienced benefits in the list given
Increased income	
Access to credit	
Access to transport services	
Higher price for sugarcane	
Access to market	
Access to extension services	
Access to extension services	
Others (specify)	

30. How do you use income from sugarcane payments/farm wage employment

1=Build better house, 2=Fund other crops, 3=Educate children, 4=Start business

31. Constraints households face by engaging in out-growers scheme (Multiple responses)

Variable	Tick the most experienced challenges
Low sucrose level	
Unfair system of weighing sugarcane and payment calculation	
Lack of sufficient factory space	
Corruption	
Sugarcane not picked on time	
Exclusion of out-growers in price setting	
Delay in farm inputs	
Difficult in acquiring land	
Others (Specify)	

32. Are you involved in investor farm employment? 1. Yes () 2. No () (*If yes go to Qn 33. If no go to Qn. 34*)

33. Reasons for participating in investor farm employment

Variable	Response (Yes=1, No = 0	
Searching for alternative income sources		
Expectation of getting higher income		
Lack of land to cultivate crops		
Low farm productivity		
Others (Specify)		

34. Reason for not participating in investor farm employment

Variable	Response (Yes =1, No = 0	
low rewards from this kind of employment		
Poor working condition		
This kind of job is regarded as job for poor people		
Delay in payment of wages		
Other (specify)		

35. Constraints household face by engaging in investor farm employment? (Multiple responses)

Variable	Tick the most experienced challenges
Low wages of investor farm employment	
Seasonal condition of work	
Poor working condition	
Payment deductions	
Lack of transparency in wage system	
Large portion of task	
Other (specify)	

D. FARMING ACTIVITIES AND HOUSEHOLD LIVELIHOOD OUTCOMES

36. Household land ownership

Land owned and usage	Size in acres	Means of land acquisition
Crops Cultivation		
Livestock keeping		
Not cultivated		
Others		
Total		

Means of Acquisition: 1 = Inherited, 2 = Purchased, 3 = Allocated by village government, 4 = Borrowed, 5 = Rented

37. Crops grown in the 2015/16 season

Crop*	Area cultivated (acres)	Inputs used	Source of inputs	Amount harvested (Kg/Bags)	All costs used	Gross monetary value per (Kg/Bags)

** List the crops grown in the order of importance*

Crop : 1=Paddy, 2= Sugarcane, 3= Maize, 4= beans, 5= banana, 6= simsim, 7= sunflower, 8= Others (specify)

Inputs used: 0 = None, 1= Local seed, 2= Recycled seed, 3=Improved seed, 4=Hybrid seed, 5=Fertilizer, 6=Pesticides, 7= Fungicides, 8= herbicides, 9 = Other (Specify)

Source of input: 1 = Used own money, 2= Loan from Cooperative, 3= Loan from Farmers Association, 4= Given by Cooperative/Farmers Association, 5= Given by relative/friend, 6 = Government subsidy program, 7 = Given by investors, 8 = Others (Specify)

38. Asset Base: How many of the following consumer durable assets do you possess?

Item	1- Yes 2-No	Quantity	Value	Total resale value at the current market price	Which one has been bought by income from investor farm wage employment/out-grower scheme
Car					
Motor cycle					
Bicycle					
Refrigerator					
Sofa set					
Kerosene stove					
Chair					
Table					
Radio					
DVD player and cabinet					
Television					
Mobile phone					
Satellite Dish					
Own House					

39. How many of the following production assets do you possess?

Item	1- Yes 2-No	Quantity	Value (TZS)	Which one has been bought by income from investor farm wage employment/Out-grower scheme	Total resale value at a current market price
Hand hoe					
Machete					
Wheel barrow					
Tractor					
Chemical Sprayer					
Power tiller					
Tractor					
land					
Others (specify)					

40. Household income earned in the last 12 months

Income source	(a) Did you get income from this source? (1) Yes, (2) No.	(b) Estimate of costs incurred on the source income in the past 12 months	(c) Estimate of gross income from the source income in the past 12 months	(d) What is the contribution of this source to total household livelihood outcomes (1) Very low, (2) Low (3) High, (4) Very high
1. Crop sales				
2. Livestock and poultry sales				
3. Fish sales				
4. Bee keeping				
5. Sale of other products (firewood/charcoal)				
6. Casual employment (agricultural related)				
7. Non-Farm activities (e.g. local brewery, trade or casual labour)				
8. Running own business				
9. Remittances				
10. Rentals				
11. Other				

41. Did you or any member in your household borrow money for the past 12 months?

(1 = Yes, 2 = No)

42. If yes how much did you borrow.....TZS
43. Have you invested money gained from selling cane/farm wage employment? 1 = Yes, 0 = No
44. If yes, (1) starting business, (2) building a house (3) buying plot (4) paying school fees (5) buying motor bike (6) paying medical expenses, (7) Others (Specify)
45. Which of the following non-farm activities did the household members engage in, in 2015/2016?

SN	Source of income Tick	Amount /months TZS	Amount/year in TZS
1	Salaried employment		
2	Investor farm wage labour		
3	Farm wage labour in the neighbouring farm		
4.	Carpentry		
5.	Charcoal making		
5	Making bricks		
6	Bicycle/motor cycle repair		
7	Boda boda (Motorcycle)		
8	Brewing and making local beer		
9	Others (specify)		

THANK YOU VERY MUCH FOR YOUR COOPERATION.

Appendix 2: A copy of Focus Discussion Guide

Socio-economic determinants of households' participation in large-scale agricultural investments and its effects on household livelihood outcomes in Kilombero valley
Focus Group Discussion Guide for Smallholder Farmers

1. Do people in this village engage in Out- growers?
2. What are the main motives of engaging in out- growers?
3. Do people in this village engage in investor farm wage employment?
4. What are the main motives of engaging in investor farm wage employment
5. List the main constraints that face out-grower and investor farm labourer in this village
6. What in your opinion are some of the benefits men and women farmers have derived from KSCL/KPL in terms of (a) livelihood activities (b) livelihood assets (c) other livelihood opportunities?
7. What kind of employment opportunities offered by KSCL/KPL to men and women farmers in this community?
8. In your view how has large-scale agriculture investment impacted negatively on the livelihood of men and women farmers in your community?
9. How do men and women farmers cope with negative impact resulting from large-scale agriculture investment
10. Without large-scale agriculture investment how do you see yourself in terms of livelihood outcomes?

Thank you for your cooperation

Appendix 3: A copy of key Informant Interview Guide

Socio-economic determinants of households' participation in large-scale agricultural investments and its effects on household livelihood outcomes in Kilombero valley

Key Informants Interview Guide

1. What in your opinion are some of the benefits men and women farmers have derived from KSCL/KPL in terms of (a) livelihood activities (b) livelihood assets (c) other livelihood opportunities?
2. What kind of employment opportunities offered by KSCL/KPL to men and women farmers in this community?
3. What constraints do men and women engaging in out-growers and farm wage employment face?
4. How the constraints of large-scale agriculture investment can be minimized?
5. What factors/issues that make household to engage in (i) investor farm wage employment (ii) out-grower?
6. Without large-scale agriculture investment, how do you see smallholder farmers in terms of their livelihood outcomes?
7. How do men and women farmers cope with negative impact resulting from large-scale agriculture investment

Thank you for your cooperation

Appendix 4: Definition of variables used in the binary logistic regression model

Variable	Definition	Level of measurement
Age	Age of the household head	Ratio (years)
Household headship	Household headship type	Nominal (1=Male-headed household, 0=Female-headed household)
Education	Household head education level	Ratio (Years of schooling)
Land size	Household land size	Ratio (Hectares)
Marital Status	Household marital status	Nominal (1= Married, 0=otherwise)
Group membership	Household group membership	Nominal (1=Yes, 0=No)
Access to extension services	Household access to extension services	Ratio (Frequency of visit by extension officer)
Access to credit	Household access to credit	Nominal (1=Yes, 0=No)
Distance to investor	Household homestead distance to investor	Ratio (Km)
Asset monetary value	Household total asset monetary value	Ratio (TZS)
Income	Household total income	Ratio (TZS)
Household size	Household total number of people	Ratio (number of people)
Dependency ratio	Household number of people below 15 and above 64	Ratio (number of people)

Appendix 5: Information on FGDs and Participants involved

Village name	Number of FGDs conducted	Number of Male Participants	Number of Female Participants	Mean age (years)	Minimum age (years)	Maximum age (years)
Msolwa	3	14	7	42	25	72
Ujamaa						
Sanje	2	10	5	44	29	61
Mchombe	1	5	3	46	31	66
Mngeta	1	4	2	48	34	70
Total	7	33	17	NA	NA	NA

NOTE: FGDs = Focus Group Discussions; NA = Not Applicable

Appendix 6: Formula used for determination of sample size

By assuming a 95% confidence level and a precision of 0.05, a required sample size will be obtained using the following formula:

$$n = \frac{N}{N(e^2) + 1} \dots\dots\dots \text{(Yamane, 1967 as cited by Israel, 2013)}$$

Where n is sample size, N is the population of all households in study villages and e is the level of precision. According to the national census of 2012, the number of households in the four villages to be included in the study is 5914. Using the above formula, a sample of 400 households is obtained for all villages.

Appendix 7: Formula for proportional sub- sample size for villages

Formula used for sample size at specific village (proportionate) was adopted from Kothari (2004) be obtained using the following formula:

$$n = \frac{N(\text{Onevillage}) \times n(\text{allvillages})}{N(\text{Allvillages})} \dots\dots\dots \text{(Kothari, 2004).}$$

Using the formula the summary of proportionate sample size is as follows:

Sample Households from selected Villages

Village	Households	MH H	FH H	Out- grower s	Investor farm worker	Non- Participa nts	Sample size
Mngeta	1286	77	10	-	38	49	87
Mchombe	1650	77	12	-	42	47	89
MsolwaUja maa	1832	78	44	44	31	47	122
Sanje	1146	64	14	41	18	22	76
Total	5914	296	80	85	129	165	400

Appendix 8: Testing assumptions of multiple linear regression model

Assumption	Test	Results
Normality test	Shapiro-Wilk	Continuous variables not normally distributed
Heteroscedasticity	Natural logarithms	Data transformed into normality
Collinearity/multicollinearity diagnostic test	Tolerance and VIF	No variables had a tolerance value less than 0.10 No variables had VIF above 10
Autocorrelations	Durbin-Watson tests	Durbin-Watson = 2.043 which fall within the rule of thumb values of $1.5 < d < 2.5$ (Kutner <i>et al</i> , 2005).

Appendix 9: Map of Kilombero District showing the location of the study villages and the two large – scale agricultural investments involved in the study

