

**LARGE SCALE LAND ACQUISITION IMPLICATIONS ON SMALLHOLDER
RICE PRODUCTION: THE CASE OF KILOMBERO DISTRICT, TANZANIA**

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ABSTRACT

The study was conducted to examine large scale land acquisition implications on smallholder rice production in Kilombero District. Purposive sampling procedures were used to obtain four representative villages. In each village 40 respondents were randomly selected leading to a sample of 160 respondents. Primary data was collected through household questionnaires, focus group discussion, key informant interview and physical observations while secondary data was collected from relevant local authority reports and records. Using various analytical techniques collected data was analyzed using SPSS. Descriptive results indicated that utilization of land acquired for large scale farming by investors was only partially used. Moreover, results of paired samples t-test indicated that rice production has significantly decreased among smallholder farmers with mean differences of 4.61 to 1.47 respectively. The study was therefore able to reject the null hypothesis which states that large scale land acquisition for large scale farming does not have effects on rice production. The results indicated that among other factors, insufficient land was a significant factor for decline of rice production ($\chi^2=21.30$; $p<0.000$). The results further indicated that farming knowledge, improved roads, distance from large scale farm, farm size and weeding were the main factors significantly affecting rice production in the study area ($p<0.05$). The study invalidate the prior concern of outset of large scale land acquisition in the study area following more of negative effects on rice production than closing the sustained low rice yield gap among smallholder farmers. Moreover, the study validates that apart from loss of land large scale land acquisition had multiple negative effects on rice production which significantly threatened rice production. It is therefore recommended that agricultural land investments strategies should carefully evaluate what they are doing. There should be carefully evaluation of the negative and positive effects to the smallholder farmers' agricultural production before land is granted

to investors. Moreover, strong watch dog instrument is fundamental in ensuring the investment by investors deliver the expected outcomes to majority of smallholder farmers and nation at large.

DECLARATION

I, Yusuph Eliapenda, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted for degree award in any other institution.

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Date

The above declaration is confirmed

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DEDICATION

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LIST OF ABBREVIATIONS AND ACRONYMS

AATF	African Agricultural Technological Foundation
ACAPs	Assessment Capacity Projects
ACT	Agriculture Council of Tanzania
ADF	Africa Development Foundation
ARC	Africa Rice Centre
CIRAD	Center for International Research in Agriculture and Development
CRILNR	Center for Research and Information on Land and Natural Resources
DALDO	District Agricultural and Livestock Development Office
ECRD	European Cooperative for Rural Development
FAO	Food and Agriculture Organization
FARA	Forum for Agricultural Research in Africa
FDI	Foreign Direct Investment
FGD	Focus Group Discussion
FIAN	Food First International and Action Network
GFC	Global Forest Coalition
GPA	Grade Point Average
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environmental and Development
ITS	Information Technology Services
KPL	Kilombero Plantation Limited
LSLA	Large Scale Land Acquisition
MAFAP	Monitoring African Food and Agricultural Policies
NAFCO	National Food and Agriculture Cooperation

NLP	National Land Policy
NSGRP	National Strategy for Growth and Reduction of Poverty
OECD	Organization for Economic Co-operation and Development
OI	Oakland Institute
PASS	Private Agricultural Sector Support
RLDC	Rural Livelihood Development Company
RLDS	Rural Livelihood Development Strategy
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SD	Standard Deviation
SPSS	Statistical Package for Social Science
SRI	System Rice Intensification
SSA	Sub Saharan Africa
SUDECO	Sugar Development Corporation
UNDP	United National Development Programme
UNEP	United National Environment Programme
URT	United Republic of Tanzania
USAID	U.S Agency for International Development
USD	United States Dollar
VEO	Village Executive Officer
VIF	Variance Inflation Factor
WARDA	West Africa Rice Development Association
WB	World Bank

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Commercial land acquisition for large scale farming has become a major cause of concern in crop production among the smallholder in developing countries. After several decades of under-investment in agricultural sector in developing countries the late 2000's witnessed a surge in foreign direct investment (FDI) in primary agricultural production (Gerlach *et al.*, 2010). In connection with the above, the 2007 and 2008 rise in global food prices is considered to be among the important causes of the phenomena (Cotula *et al.*, 2009; De Schutter, 2011; World Bank, 2011; and Haralambous *et al.* 2009 cited by German *et al.*, 2011). It is argued that the rise of food commodity prices prompted countries that heavily depend on food imports to search for farmland abroad (Ellen *et al.*, 2012). Literature shows that the problem is serious in African countries. It is for example, argued that 29 out of 56 million hectares of land sought after foreign investors globally is located in Africa, mainly in Sub Saharan Africa (Deninger *et al.* 2011 cited by Gurara *et al.*, 2012). This amount of land is seen as the answer of meeting the food needs of the current and future population. Nevertheless, it is the same land that peasant producers across rural Africa require to support their livelihoods and smallholder production that is targeted for large scale acquisition (Odhiambo, 2011).

According to Africa Development Foundation (2012), Africa is considered to be one of the continents having more productive land than other continent in the world, but with highest agricultural yield gap compared to other parts of the world. It has been observed that, production is being hampered by a number of factors. It is for example FAO (2010) noted that, current agricultural land is facing degradation and therefore, decreased yields.

Likewise, potential farmland for expanding agricultural production is increasingly being restricted due to competing land uses such as bio fuel production, urbanization and in longer term, climate change. It was on that ground Jayne *et al.*, (2005) pointed out that, the trend in the steady decline of land to person ratios has been further threaten African agriculture which is highly dominated by smallholder producers who provide up to 80% of the food supply in Asia and Sub Saharan Africa. It is widely known that, smallholder farmers are the key group requiring attention in agricultural and rural development. Increasing their productivity and incomes can make a major contribution to reducing hunger and poverty (Zhou, 2010). On contrary to that concern, many African governments have seen large scale agriculture model that step up introduction of big agricultural plantation involving leasing of large tracks of land to investors as a long term solution. Despite the fact that, experience of large scale farms in Africa is not all positive. It is for example, Coulson (1993) and International Fund for Agriculture Development (2011) noted that, there have been spectacular failure, especially where inappropriate mechanization has led to severe erosion as in the ill fated groundnut scheme of Tanzania in 1940's or the export vegetable cultivation in Senegal in 1970s.

In view of the above, the current large scale land acquisition for large scale agriculture production is giving rise to several concerns. Albeit, proponents of these acquisitions considered that smallholder farmers can benefits from these investment but these benefits can be directly seen on macro level through government revenues, employment, foreign exchange, development of rural infrastructure and poverty, reducing improvement such as construction of schools and health centers (Cotula *et al.*, 2009; Graham *et al.*, 2009; Haralambous *et al.*, 2009; FIAN, 2010; Gurara *et al.*, 2012). However, it is also considered that land acquisition for large scale farming may largely affect the production of rural population to whom majority of them are smallholder farmers. It is for example,

among others include increased pressure and competition over land and water, land conflicts, increased dependence on food aid and displacement of smallholder farmers from arable land in rural areas, where the local population is still growing and where the average size of family farms declining (Haralambous *et al.*, 2009). However, many other developing countries are facing similar issues; the situation in Tanzania is particularly problematic.

Land acquisition for large scale farming in Tanzania has been a wide spread incident in almost a large part of the country. Morogoro Region is among the considerable source of land for investment and it occupies a total of 73 939 square kilometers which is approximately to 8.2% of total area of Tanzania mainland (Chachange, 2010). From the time when high demand for farmland occurred, number of multinational, national and private domestic companies acquired land in various Districts in the Region with different purposes most notably agricultural production. Rice producing districts including Kilombero District have been affected by land acquisition for large scale farming. The District is considered important for rice production with a planted area of over 53 096 hectares (ibid). Although, Agriculture Council of Tanzania (2007) reported that rice is estimated to contribute about 95% of staple food consumed in Kilombero District but the current rice yields are low at an average of 1-1.5 tons/ha (Rural Livelihood Development Strategy, 2009). In the face of this unprecedented large scale land acquisition for large scale farming rice production among smallholder producers will progressively be endangered if not properly managed.

1.2 Problem Statement

The current wave of land acquisition for large scale farming in Tanzania has been defended on the ground of the potential it can have on increase of agricultural production. Irrespective of that, rice yields are on average still low (RLDC, 2009). In a number of rice

survey studies, factors which cause low rice yields in Tanzania have been established. These include use of genetically low yielding varieties, drought, low soil fertility, weed infestations and prevalence of insect pests and diseases (URT, 2011; Banwo, 2002). However, it should be clearly known that, large scale land acquisition for large scale farming can be a problem because most of the land is acquired from smallholder producers. Likewise, it has been observed that most of land acquired remains undeveloped for the claimed purpose while smallholder producers remain land less. URT (2003) pointed out that Morogoro Region has about 110 large scale farms with the land area totaling 19 890 hectares under crop production; however, out of the total land allocated to large scale farms about 11 325 hectares of land remains undeveloped. Experience shows that land acquisition has long historical consequences to smallholder farmers. This has in most cases led to production decline among smallholder farmers and frequent conflicts between smallholder producers and investors. In the face of this pressure on farmland acquisition for large scale farming rice production among smallholder producers will progressively be endangered if not properly managed. Although researches have been done on land acquisition for large scale farming like that of HAKIARDHI (2010) and (2011) which focus on terms and conditions of the contracts for investment and leasing of land for bio-fuel and forest investment, there is limited documentation on the effects of large scale land acquisition on smallholder rice production.

1.3 Justification of the Study

The study aimed at enlightening a range of actors at national to local levels on the effects of land acquisition for large scale farming on smallholder rice production in Tanzania. It is also intended to provide empirical information to the policy makers and policy implementation agencies to formulate an enforcement mechanism to hold investors accountable and control their activities for them to yield the intended results including

raising agricultural productivity in the country. Justification for choosing rice as a target crop was based on the fact that it is estimated to contribute about 95% of staple food consumed in Kilombero District and others parts of Morogoro Region (Agriculture Council of Tanzania, 2007). On the other hand, Kilombero District was chosen as a case study because it is one of the districts where large scale land acquisition has occurred and rice accounts for 40% of the regional output.

The study is timely as it is in line with the National Rice Development Strategy which is to double current rice production by year 2018. It is also in line with second National Strategy for Growth and Reduction of Poverty (2010) which intends to increase agricultural production, food security and household's income.

1.4 Objectives

1.4.1 Overall objective

To examine the effects of land acquisition for large scale farming on smallholder rice production

1.4.2 Specific objectives

To address the overall objectives above the study worked on the following specific objectives;

1. To assess extent of utilization of land acquired for large scale farming in the study area
2. To determine the effects of land acquisition for large scale farming on smallholder rice production in the study area
3. To assess attitude of smallholder rice producers on land acquisition for large scale farming in the study area
4. To determine factors affecting rice production in the study area

1.4.3 Research Questions

To realize the purpose of the study investigation was guided by the following research questions;

1. How land acquired for large scale farming is being utilized in the study area?
2. What are the negative effects of loss of land for large scale farming on rice production in the study area?
3. What are the negative socio-economic effects of large scale land acquisition for large scale farming in the study area?
4. What are the benefits of large scale land acquisition for large scale farming in the study area?
5. How do smallholder rice producers perceive land acquisition for large scale farming in the study area?
5. What are the factors affecting rice production in the study area?

1.5 Research Hypothesis

Hypothesis;

H₀1: Land acquisition for large scale farming does not have effects on smallholder rice production

1.6 Conceptual Framework

According to Maxwell (2004), a conceptual framework is a visual or written product, one that explains, either graphically or in narrative form, the main things to be studied the key factors, concepts or variables and the presumed relationships among them. The framework (Fig. 1) accommodates a set of independent variables, background variables and intermediate variables that are likely to influence rice production among smallholder farmers. In view of that, rice production is the dependent variable, both positive and

negative spill over's of large scale land acquisition are considered as independent variables while factors responsible for rice production are treated as intermediate variables. The study presume that positive effects of large scale land acquisition as all the promises hold by investors to smallholder farmers with regard to increased of household crop production. These include development of infrastructure like roads and markets, provision of social services (like health centers, water supply and electricity); provision of farming inputs (like fertilizers, seeds, planters and weeders); and technological transfer. The study assumes that, it is quite possible that, rice production among smallholder farmers can consecutively increase if and only if investors will stay accountable to their promises (Fig. 1). However, large scale land acquisition can be associated with negative aspects that can result into loss of rice produces among the smallholder farmers. These include loss of arable land used in rice production, land conflicts, food shortage, water shortage, health infections as far as large scale application of chemicals is concerned, land degradation, loss of income obtained from selling their yields, decline of production as a result of loss of land and loss of properties. The study assumed further that, some of these negative effects might occur if and only if some of the promises made by investors will not be fulfilled (Fig. 1). Moreover; this framework assumes other factors remaining constant, large scale land acquisition can have direct or indirect effects on smallholder rice production. This is highly dependent on a set of intermediate variables which perhaps link independent and dependent variables once the relationship between them cannot be clearly understood. This is to say, large scale land acquisition can occur but still production of smallholder farmers can remain high under certain factors such as access to extension services, access to use of hired labor, access to farming inputs that include fertilizers and improved seeds, markets and use of improved agronomic practices that farmers may receive from government as subsidies to smallholder farmers and private institutions like NGOs and CBOs.

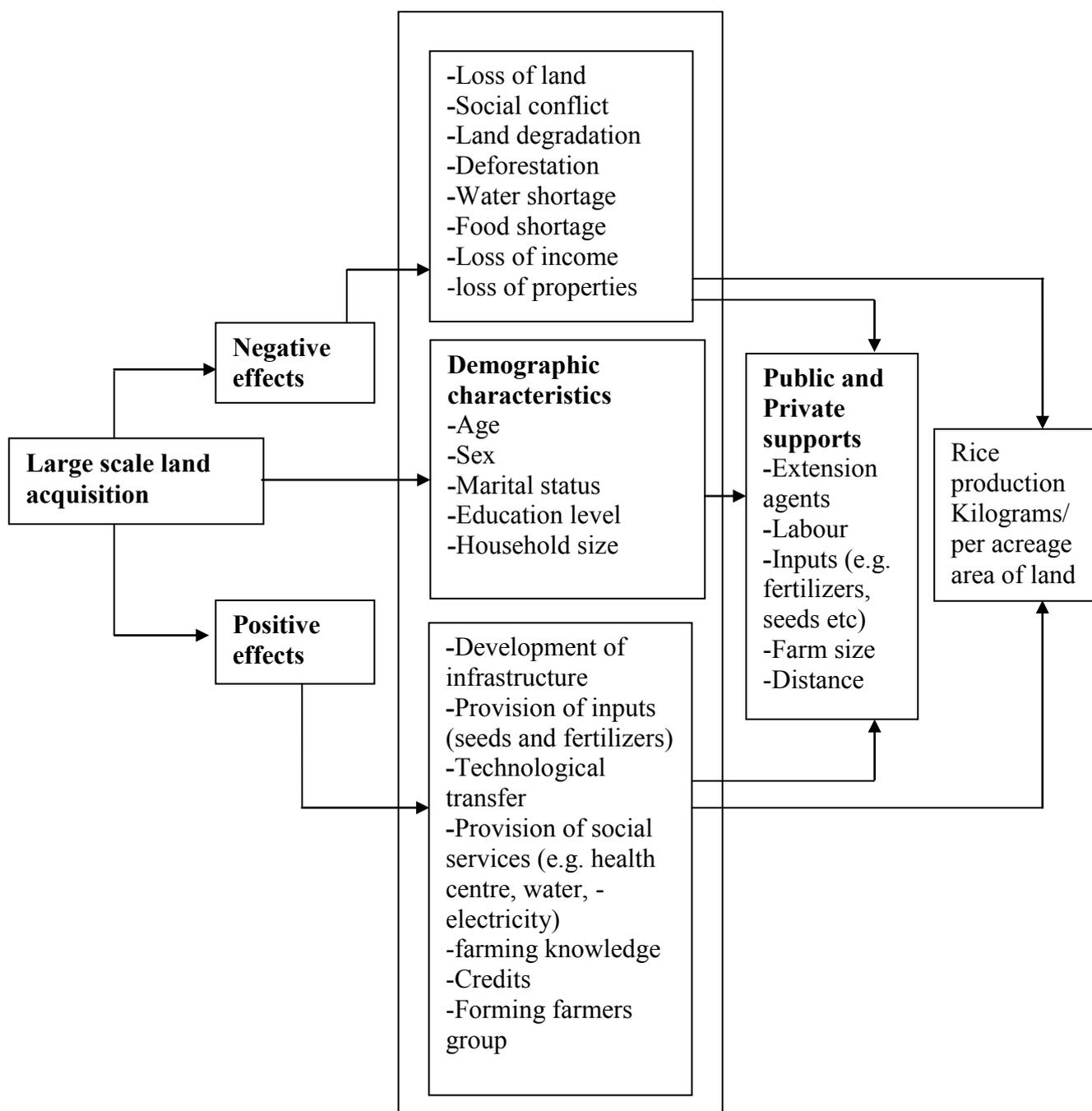


Figure 1: Conceptual framework on effects of LSLA's on rice production

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter presents the definition of the key concepts as linked to the subject. Further to that the chapter outlines relevant literature information reflecting to each of the objectives of the study. These include literatures on utilization of the land acquired by investors for large scale farming, effects of large scale land acquisition on smallholders' crop production, attitudes of smallholder farmers on large scale land acquisition and factors responsible for rice production.

2.1 Land Acquisition

Global land grabbing, large scale agriculture investment and international agriculture investment are the terms most commonly and interchangeably used to define the renewed interest in agriculture and surging demand for land in terms of large scale land acquisition worldwide. In an attempt to conceptualize the word large scale land acquisition, McElvenney (2012) considered time period as one of the key features behind large scale land acquisition. In this view, he noted that land grabbing and large scale land acquisition are terms often used to describe the purchase or long term lease of the land by foreign and domestic investors typically for period of 50-99 years. Likewise, German *et al.* (2011) and Cotula *et al.* (2009) added that, global land grabbing conjures up image of foreign governments or corporate interests operating single handed to secure large tracks of farmland to hedge against insecurities of food, fuel, and fiber in their countries of origin.

However, maintaining the same meaning but in different view, Kachingwe (2012) expressed that, large scale land acquisitions are absolutely land grabbing because of an alarming number acquisitions involved purchase of thousands of hectares of land without

due respect for local land users entitlements to the land, either through proper consultation, informed consent or adequate compensation for the loss of land based livelihoods. That was a reason, Franco *et al.* (2012) argued that, a better way to start to understand land grabbing (large scale land acquisition) is through the lens of political economy. From this perspective, he noted that land grabbing is essentially control grabbing. It refers to the capturing of power to control land and other associated resources like water, mineral or forests in order to control the benefits of its use. The definition has been consolidated by Merian research (2009) when defined large scale land acquisition as land loss by rural population occurred due to large scale land acquisition by foreign business (be it by purchase, lease or other forms of control over land such as long term contract farming) for industrial agricultural production (be it for food, agro-fuels or other agricultural rural commodities).

However, land size was identified as other common feature surrounding large scale land acquisition, as more acquisition involves more than 10 000 hectares and several more than 500 000 hectares. Having seen all definitions, the present study adopted the definition by Sindayigaya (2012) who defined land acquisition as purchase or lease of vast tracks of land by wealthier, food insecure nations and private investors from mostly poor, developing countries in order to produce crops for exports. It is the scale, rate, negative impacts and extreme lack of transparency surrounding these large scale land acquisition that have been criticized and made advocate group to characterize them as “land grabbing”.

2.2 Smallholder Farmer

The definitions of who is a smallholder farmer are diverse worldwide and for that reason it has been argued that there is no clear cut definition of who is a smallholder farmer.

Chamberlin (2007) argued that, land holding size is perhaps the most direct and easily introduced indicator of who smallholder are; others being wealth, market orientation and level of vulnerability to risk. Livingstone *et al.* (2011) positively supported his argument when defined smallholder as being 2 ha or less represents 80% of all farms in Sub Saharan Africa and contribute up to 80% of the production in some SSA countries. Bertow (2007) observed that most of them are subsistence or semi-subsistence farmers (semi-subsistence means growing for home consumption and selling additional products on local markets). He added that, in the majority of cases they use simple technologies (smallholder farmers often rely on hand hoes and oxen) and cultivation practises (These are for example, minimal purchased inputs like fertilizers).

In other studies like that of Jayne *et al.* (2003) and Salami *et al.*, (2010) several key characteristics have been highlighted in attempt to obtain the clear definition of a smallholder farmer. For example, Salami *et al.* (2010) observed that Africa smallholder farmers can be categorized on the basis of the ecological zones in which they operate, the types and composition of their farm portfolio and land holding or the basis of annual revenue they generate from farming activities. He added that, in areas with high population densities, smallholder farmers usually cultivate less than one hectare of land, which may increase up to 10 ha or more in sparsely populated semi-arid areas, sometimes in combination with livestock of up to 10 animals.

While on the basis of farm revenue, he argued that smallholder farmers range from those producing crops only for family consumption to those in developed countries earning as much as USD 50 000 a year. Lastly, he noted that, most smallholder operations occur in farming system with family as the centre of planning, decision making and implementation, operating within a network relation at the community level. On the other

hand, Abera (2009) observed that, a smallholder farmer is the one with limited land availability. However, he also pointed out other aspects that are critical in characterizing resource poor smallholder farmers in the developing world. These are limited capital, poor resources endowments, subsistence oriented, fragmented holdings, limited access to inputs and highly vulnerable to risk. Having seen all the key aspects outlined as far as who is a smallholder farmer, the present study adopted land holding as common aspect and therefore smallholder farmer was defined as one who cultivates rice in less than 10 acreage of land.

2.3 Rice Production

Rice is of special importance for the population in Asia, part of Latin America, Caribbean and Africa. Rice is a major food staple and mainstay for more than 3000 million people and is cultivated by small farmers in holding of less than one hectare (Food and Agriculture Organization, 2006). It is considered a strategic commodity in many countries both developed and developing because of its special importance in nutrition, wage in cash crop or non agricultural sectors and culture of the people (Nguyen, 2010). Moreover, it has been pointed out that, because of its nutritional characteristics and the high price it commands compared to other starch crops, rice is predominantly a food commodity, with human consumption estimated to represent around 85% of total rice utilization (FAO, 2006).

Rice is grown in different ecosystems including temperate, sub-tropical and tropical ecosystems. Nguyen (2010) highlighted that, based on soil water condition rice production ecosystem; include irrigated low land, irrigated upland, rainfed lowland, rainfed upland and deepwater or floating ecosystem. Dowling *et al.* (1998) noted that, about 80 million ha of rice (more than half the harvested area) is grown under irrigated conditions worldwide.

Farm yield under irrigation ranges from 3 to 9 tons/ha. The irrigated rice ecosystem contributes 75% of global rice production and provides the predominant source of marketable surpluses for growing populations, particularly urban areas (Bouman, 2007). However, there has been a raised concern over the future of rice sector caused by increasing competition for resources (in particular land and water), non agricultural activities and the negative environmental impacts which threatening the long run sustainability of rice production especially in Asia. Tran (1997) pointed out major issues in rice production that have led to decline of yields. These include low temperature in temperate areas, problem of water use efficiency, land degradation, pollution, land constraints and major biotic stresses.

In Africa, according to West Africa Rice Development Association (2006a) about 20 million farmers in Sub Saharan Africa grows rice, and about 100 million people depend on it for their livelihoods. Forum for Agricultural Research in Africa (2009) reported that rice is consumed widely in all countries and sub-regions of the continent and is cultivated in almost all African countries under varied environments and a wide variety of climatic and soil conditions.

According to Africa Rice Centre (2011), the average rice yield in the continent is lowest in the world (1-3 tons/ha) compared to Asia where average yield is 4 tons per hectare. In SSA rice is dominated by subsistence, smallholder who has limited markets, inferior equipments such as hand hoes and limited use of inputs (West Africa Rice Development Association, 2007b). Manneh *et al.* (2007) and Africa Rice Centre (2011) avers that, the current trends of rice production is attributed by many factors which include abiotic factors (drought, submergence, extreme temperature, salinity and low soil fertility) and biotic constraints (weeds and diseases such as blast) which limits the continental rice

production. Moreover, African Agricultural Technological Foundation (2012) argued that, the slow growth in domestic rice production has been attributed to low yields being achieved by rice farmers in SSA. Several factors are responsible for low rice production. However, nitrogen deficiency and drought have been cited as leading constraints in upland rice production, while high salinity is increasingly becoming a major problem in many rice growing areas of Africa. Nevertheless, West Africa remains at the hub of rice production in SSA but the shortfall in rice production has increased significantly as consumption rises at a rate well above that of production growth (WARDA, 2007b).

According to Hurle (2012) rice is the third most important food and cash crop in Tanzania after maize and it is among the major source of employment and income for many farming households. Rice production in Tanzania is approximately grown in more than 681 000 ha, representing 18% of cultivated land (Jirawut, 2009). It has been noted that, 99% of rice is grown by smallholder farmers using traditional seed varieties (Hurle, 2012). However, evidence from literature shows that rice production in Tanzania is lower compared to other neighboring countries. It is for example, according to Monitoring African Food and Agricultural Policies (2013) rice productivity is at an average 1-1.5 tons/ha which is lower than in most neighbor countries such as Rwanda, Kenya and Burundi and one of the lowest in the world. This has been attributed by factors such as lack of land suitable for rice production and insufficient knowledge available in the new group of producers (Hurle (2012).

In addition, low adoption of yield enhancing inputs and technologies because a significant number of farmers still rely on rainfall and traditional seeds varieties (RLDC, 2009). European Cooperative for Rural Development (2012) added number of issues caused low yield in Tanzania, mainly the use of low yielding varieties, droughts, low soil fertility,

weed infestation and prevalence of insect pests and diseases. Other constraints outlined were dependence in rainfed rice production, deterioration of drainage and irrigation facilities, inability of rice farmers in access to credit caused by the reluctance of commercial banks to provide financial support as most of the farmers lacks land entitlement as collateral. Notwithstanding the constraints in rice production Hurle (2012) reported that, 25% of the national rice production comes from two regions; Mbeya (Kyela and Mbarali) and Morogoro (Kilombero and Wami). He added that, rice is produced by both smallholder farmers, medium and large scale farmers with the total area under rice cultivation in 2005 was 702 000 hectares of which 90% were under small scale farmers and the rest under large scale farmers.

2.4 Utilization of Land Acquired for Large Scale Farming

The global food crisis and oil crisis of 2007 and 2008 largely contributed to the increased pace of land acquisition, with some food importing countries seeing acquisition of farmland in developing countries as a means to guarantee food security for their own populations and thus started to purchase land in developing countries to outsource their own food production (Grain, 2008). For that reason, fertile land became a new strategic asset for countries seeking food security such as China, Japan, South Korea, Saudi Arabia and Gulf States while the target developing countries included nations such as Madagascar, Tanzania, Cambodia, Laos and Sudan (Cotula *et al.*, 2009 and Kaloustian *et al.*, 2009). It has been reported that, out of the 1217 agricultural land deals for commercial large scale farming worldwide amounting to 83.2 million hectares of land are in developing countries (Ansew *et al.*, 2012). Despondently, it has been observed that, little of this land is being used to feed people in those countries, or going into local markets where it is desperately needed. Instead, the land is being left idle, as speculators wait for

its value to increase and then sell it at a profit, or it is predominantly used to grow crops for export, often for use as bio fuels (Geary, 2012).

Literatures have managed to report different case which indicates that, acquisition of the large tracks of land in developing countries, have not being adequately developed for agricultural production. Boche *et al.* (2013) noted that, a detailed analysis of the agricultural projects approved between 2007 and 2012 in four Mozambican provinces shows failure of 63% of the projects. He added that, this level of failure is even higher for projects dedicated for bio fuel production (77%). Similarly, Hallam (2009) observed that implementation status of big projects in countries such as Tanzania and Zambia verified such trends as implementation status were surprising limited. But they further observed that, among the projects that had started, the areas in operation were typically much smaller than those allocated. In his study, Tomaselli (2007) reported that, many projects in the bio fuels sector which acquire lease of big parcels of land experienced financial problem or were cancelled entirely due to lower oil prices. Locke *et al.*, (2013) added that none of the bio fuel operations were operating at the envisaged scale and all of them reported delays of at least three to five years in Mozambique. In some other cases, some large scale projects in agriculture failed due to different reasons including difficult of raising additional funds that led project change the plans (Oakland Institute, 2011).

In Tanzania, the National Land Policy (NLP) recognizes and emphasizes that, land is available for investment purposes. However, it is reported that, in the past significant proportion of land was allocated to individuals, private firms including foreign investors regardless of their proven ability to develop the land. Consequently, large areas of land remain undeveloped or are held for speculative purposes (URT, 2003). It is for example, according to Tanzania national agricultural sample census (2003), of all the land allocated

for large scale farming in Morogoro region about 11, 325 ha were found not developed. Several surveys carried out in Tanzania managed to show some other cases of spectacular failure of big large scale agriculture projects. Horne *et al.* (2011) reported that, the Dutch/Belgian firm leased 32 000 ha for *Jatropha* in Kilwa ending abandoned the land, Eurovistas India company leased 6000 ha in Rufiji and managed to develop only 470 ha while remaining land was left idle. It has been sadly reported that, despite the company's failure to utilize the leased land it was not accessible to people surrounding villages because they have lost right of ownership Boche *et al.* (2013).

2.5 Effects of Large Scale Land Acquisition on Rice Production

Several studies have been carried out in the area of effects associated with large scale land acquisition on smallholder and local communities in different parts of the world. This subsection in chapter two presents the effects of large scale land acquisition on crop production among smallholder and rural communities including other effects associated with large scale land acquisition socially, economically and environmentally that are considered having direct link to the production.

2.5.1 Decrease of rice production

The competition between food and energy for limited land and water resources has raised concern over the future of rice sector dominated by smallholder farmer's worldwide (Laborte *et al.*, 2011). It has been noted that, the increased speed of large scale commercial acquisition of land mainly occurred between 2007 and 2008 for energy crops such as sugar, rubber, oil palm and *Jatropha* hamper rice production of in South Eastern Asia and Africa in particular. Prachvuthy (2011) revealed that in Cambodia rice yields have decreased dramatically since concession companies cleared the forests and took over community land. He noted that, most farmers reported yield decrease 60-70% following

large scale land acquisition. In addition, Roux (2014), Kong (2009) and Hanssen (2007) observed that, the rapid progression of sugar sector in Cambodia and Lao witness the drastic consequences to rice production. As a result, most of the formally self sufficient rice produced families overburdened with dept and unable to produce or buy their own food. Likewise, in South Asia report by Center for Research and Information on Land and natural Resources and National Land management Authority (2009) observed that, 80% of the villagers in six villages used to be able to produce enough rice for their consumption throughout the year in 2003. From 2003 to 2006, since the establishment of the rubber plantations, the total yields of harvested rice were reduced by one third, from 367 tonnes before the land concession to 240 tonnes.

2.5.2 Chemical destruction of the crops

According to Verma (2008) contribution of agricultural mechanization has been well recognised in enhancing the production together with irrigation, biological and chemical inputs of high yielding seed varieties, fertilizers, pesticides and machinery energy. However, several studies have indicated that large scale land acquisition mainly for commercial agriculture may have large impacts on smallholder crop production. According to Poulton *et al.* (2008) argued that, large scale commercial agriculture that involves large scale monocropping results in pollution of land and water by pesticides and nitrates including waste products from sugar factories. The impacts of pesticides especially those responsible for spraying and on other organisms including natural predators of pests and declines of soil fertility were also observed.

2.5.3 Decline of arable land for agriculture production

Land has emerged as a strategic commodity markets for governments looking to integrate land acquisition with national food demand for the medium and long term worldwide in

particular developing countries. According to Food and Agriculture Organisation, (2010) African governments have been argued to promote private sector investment in land resources as part of strategy to generate increases in private sector revenue in support of rural development strategies. In respect to that, investors have responded favourably to Africa's open land sector seizing opportunities to secure large areas of land for food production and biofuel development. The availability of arable land has made Africa a competitive location for investors who are able to gain access to sizeable holdings with government support.

Also, Mueller *et al.* (2012) and Liversage (2010) noted that, increased private sector investments, although welcomed as a means to close the yield gap but also posed critical questions regarding loss of arable land used in agriculture among the rural poor. According to German *et al.* (2011) almost half of the agricultural land deals concern areas that already used for crops. Misereor (2010) noted that since investors set their sights on fertile areas in the target countries which have access to water and are served by transport routes, these areas were most used by local population. FAO (2011) cautions that, with increased pressure on land and water resources a problem is that some of the countries experiencing the fastest population growth are those where land and water resources are least abundant.

Land and water for crop production, already constrained in some locations, will experience rising competition, particularly from fast growing urban settlements (Hanjra *et al.*, 2010). Also increasing respect for conserving broader ecosystem services will further limit access to land and water (FAO, 2011). Consequently based on pattern of land access reveal growing inequalities in various African countries as access to arable land contracts. Moreover, FAO (2010) further noted that, strong upward trends in land investment have

occurred against a backdrop of narrowing land access to low income households. Increasing numbers of rural poor face the prospects of land displacement and landlessness result of diminishing land resources. Haralambous *et al.* (2009) has further noted that, the growing demand for land in rural areas of developing countries including Tanzania, is taking place in a context of increasing land scarcity and land degradation. To support their argument, it has been reported that, landlessness and land fragmentation are growing worldwide. For example, in India, average landholding size fell from 2.6 hectares in 1960 to 1.4 hectares in 2000 and is still falling.

In Cambodia, Johnsen *et al.* (2012) observed that, rural landlessness rose from 13% in 1997 to 20% in 2004, and analysts believe that the current figure is close to 30%. Similarly, in East and Southern Africa, cultivable land per capita has halved over the last generation, and in a number of countries, the average cultivated area amounts to less than 0.3 hectares per capita (Haralambous *et al.*, 2011). It has been reported that, land in the rural areas of developing countries is not only limited in quantity but also in quality, thereby reducing its productive potential. There have been different cases on the loss of land among the rural community using them in crop production reported worldwide. According to Haralambous *et al.* (2009) in Colombia and Afro-Colombian communities have been evicted from their land in the north-western region and along the Pacific coast to make way for oil palm plantation. Loss of arable land for agriculture has become a threat in smallholder production; either for subsistence or income generation. It is for example Rawat *et al.* (2011) reported that, large scale land acquisition has caused landless among a large section of the households in the affected village, especially in Polepally and Gundlagadda as SEZ land acquisition led to drastic reduction of local availability of farmland and tenants farmers have fallen from (9%) to (6%). Several researchers tried to explain how large scale land acquisition led to the displacement of local people in their

land sometimes even without due respect for local users entitlement for land, either through proper consultation, informed consent or adequate compensation for the loss of land. Kachingwe (2012) observed that, most likely to be affected will be the rural women, who even fewer fallback options when secondary access to land and natural resources is eroded. In Uganda Global Forest Coalition (2012) reported that, during the eviction of the Batwa indigenous communities from Semliki forest reserve; community members were resettled on only an acre of land without any piece of land where they could grow crops. Therefore, the growing demand for land in rural areas of developing countries is taking place in the context of increasing the scarcity of arable land for crop production.

2.5.4 Decline of water for crop production

According to International Fund for Agriculture Development (2010) there are some 500 million smallholder farms worldwide; where more than 2 billion people depend on them for their livelihoods. These small farms produce about 80% of the food consumed in Asia and sub-Saharan Africa. It is widely known that access to water remains the key issue among the smallholder crop producers in Africa and other parts of the world. Their ability to contribute to food security and increase their own incomes is however often hindered by policies and practices that fail to recognize or meet their needs. Ghatak (2010) noted that, since 2008 there have been massive foreign land transactions, which involved large scale foreign investments in farmlands and direct participation of transnational corporations and financial oligarchs in agricultural production. Zerrouk (2013) noted that, despite their interest in farmlands also availability of useable water resources is a prerequisite to each land purchase. Helena (2013) highlighted that, water conflicts are major emerging issue globally. This is due to the fact that, big numbers of agro energy projects which have been associated with transnational land deals have been promoted in different parts. In respect to that, demand for water is increasing greatly and this includes extending irrigation to

new areas, especially in Africa. In other words, land deals in Africa involve large scale, industrial agricultural operations that will consume massive amount of water, nearly all of them located in major river basins with access to irrigation. Thus, foreign agricultural investors in areas that depend on irrigation seem to be getting fat deal out of available water resources to the detriment of small scale farmers (Ndiaye, 2013). It is for example, Grain (2012) cautions that, third world Africans countries already live in water scarce environment and climate change is likely to increase the numbers significantly.

2.5.5 Environmental effects of large scale land acquisitions on rice production

Many countries in Africa and beyond seem to be pinning their faith on a development model that is based on large scale agriculture that involves acquisitions of large areas of land or agribusiness supported by foreign direct investment. However, some critical literature argued that, large scale agriculture has a number of environmental impacts that need to be taken into account that in a long run has more implication on future agricultural production. These are summarized below:

2.5.5.1 Deforestation

According to Tejaswa (2007), deforestation is the conversion of forest to an alternative permanent non-forested land use such as agriculture, grazing or urban development. Chakravarty *et al.* (2012) identified some of the agents of deforestation that are those slash and burn farmers, commercial large scale farmers, ranchers, loggers, firewood collectors, infrastructure developers and others who are cutting down the forest. The increasing commercial interest in farmland particularly for the purpose of plantation agriculture has become the subject of much doubt over its implications on the environment. Schoneveld (2011) reported that, since 2005 rapidly changing global market conditions have

encouraged various actors to seek access to large areas of fertile agricultural land for cultivation of food crops, mining and bio fuel feedstock's.

Previous works presented relevant critics on growing demand for land purposively to be used in production of food and energy crops such sugarcane, oil palm and soy. This was due to producer's efforts to produce based on the expectations of future demand of the products from these bio energy crops, motivated by higher fossil fuel prices, growing mandate for blending bio fuel in fossil fuel used for transportation (Hamelinck *et al.*, 2013). It is for example Gao *et al.* (2011) noted that, bio ethanol production induces greater forest conversion and increases the pressure on land for food production. For that reason, Melillo *et al.* (2009); Fargione *et al.* (2008) and Searchinger *et al.* (2008) observed that, once these land-use changes are taken into account, the biofuel carbon balance can become negative, meaning that more carbon is released producing and using biofuels than the equivalent amount of energy from fossil fuels.

In some cases, land use change to produce biofuel crops have been linked to deforestation, habitat loss, water stress, land degradation and encroachment into conservation land. Mayrand *et al.* (2005) reported that, in Brazil the conversion of forest to cropland has also become a significant problem in the centre west region of Brazil. Deforestation has led to a significant drop in precipitation in Savannah regions leading to longer dry seasons. Gao *et al.* (2011) and Andrade de *et al.* (2010) reported that, ethanol production can impact deforestation and food production in different ways. Where there is direct land competition effect in which forest conversion is increased while food productions declines. This was also supported by UNEP (2012) which indicated that, redirection of food crops as well as land used for food crop production to fuel production has been

linked to distortions in the world food system, contributing among other factors to increased food prices.

The expansion of bio ethanol production has motivated an intense debate about the local and national social economic and environmental implication because all forms of bio energy require vast areas of land for their production. This is due to the fact that, no other form of energy requires as much land to be converted to generate a unit of electricity. In other cases, it has been noted that, the impacts of large scale bio energy project launched in different part has not only end up causing deforestation of the forest but also caused community violations. In Uganda for example Global Forest Coalition (2013) reported that, because of the state bias in favor of inward and domestic investment strategies, the communities were being marginalized to the extent that the majority of communities in areas where these projects are being implemented have lost their land, including forests and other resources to investors. It has further been noted that, many projects introduced in Uganda are associated with community violations. For example, the Kalangala oil palm project has led to deforestation and land conflict. It was further observed that, during the eviction of the Batwa indigenous communities from Semliki forest reserve, community members were resettled on only an acre of land without any piece of land where they could grow crops.

2.5.5.2 Land degradation

Land degradation is one of the most severe problems that have led to low crop production worldwide. According to Kertesz (2009) the concept originates from soil degradation and it is often used as a synonym for land degradation. It is evident that if soil is degraded it has huge impact on both the land and landscape because soil degradation presents or impedes plant growth. The recent large scale land acquisition for large scale commercial

crops as alternative energy include bio fuels (i.e. soybean, sugarcane, cassava and maize) have been highly associated with land degradation due to the trends in conversion of land in both developed and developing countries. Hurni *et al.* (2013) observed that, since 2005 about 0.5 percent of the global land surface has been converted from cropland and dry land for food and feed to cropland for bio fuel production. Large scale bio fuels are either competitive or causing additional land degradation in already depleted environment from the climate change affecting the globe. It has already noted that, land resources are finite, fragile and non renewable (Salapakta *et al.*, 2010). They include soil, which is mainly important for agriculture, land cover which is important for the environment, and landscape which are important for component of human habitat and welfare (UNEP, 2012).

German *et al.* (2010) reported that, the additional use of fertilizers and pesticides in large scale agro industrial agriculture, inappropriate farming practices and untreated water from processing plants can lead to land degradation and increased risk for local populations. Mayrand *et al.* (2005) observed that, following the removal of natural vegetation in Brazil, the agricultural lands are susceptible to intensive agricultural production, and since they are poor in nutrients and often acidic, they are vulnerable to soil erosion. The impact of soybean production on land degradation in the Cerrado result for both expansion of cropland and intensification of production. Gorgen *et al.* (2009) further insisted that, applying intensive agricultural production has an impact on biodiversity responsible for maintaining soil nutrients, carbon stocks, and land and water resources. This is through, increase in soil erosion and worsen climate change by displacing forest areas and other land use changes, which result in high carbon stock releases especially when fire takes place. Loss of soil quality can be caused as well as unsustainable use of chemicals and loss of biodiversity due to large scale monoculture production systems.

2.5.6 Economic effects of large scale land acquisitions on rice production

Different sources of literature indicated that, large scale land investment has been promoted on the ground of its contribution that might have on the livelihood of community in specific areas. Nevertheless there have been different views on negative impacts including the displacement of the people on their agricultural land and hence loss of their incomes obtained from selling their crop during the harvest periods.

2.5.6.1 Loss of farm income

Many people in Africa and some other in developed countries generate income and earn existence from land. According to Cotula *et al.* (2008) the dependence on land applies both to societies where land is used for food production and to societies where crops are produced for commercial purposes. Similarly, Prachvuthy (2011) added that, household incomes of indigenous people are based mainly on agricultural production and non timber forest products. He further argued that, agricultural incomes come from rice production, production of other cash crops and livestock keeping while non timber forest product incomes come from resin, honey, bamboo, vine, rattan, wild fruits, vegetables, herbal medicines and handcraft production. For that reason, Gobena (2010) noted that, any loss or change in land holding has considerable effects on the majority of farmers since farming is the main source of livelihood. Previous studies have managed to show different cases in Sierra Leone, Ethiopia and Tanzania over loss of income due to large scale land acquisitions.

Baxter (2013) observed that, local people have lost their income obtained from selling crops such as groundnuts, cassava, beans, yams and palm oil as cash crop since the government allocated land to investor for large scale industrial plantations. The acquisition of land for *Jatropha* plantation in Kisarawe Tanzania have also affected access to natural

resource livelihood based activities which to some of the villagers form a significant portfolio to household income and contribute to food security (Mdemu, 2011). He reported that, about 55% of the study communities experience difficult access to fuel wood products and wood collection, increased distance to water sources, limited wildlife catching, and difficult availability of natural resource products. Although labour on economic large scale land acquisition is beginning to emerge as alternative but lessons of the past are not encouraging.

Theting *et al.* (2010) observed that, studies conducted in East Africa countries -Tanzania and Mozambique shows that the large scale agriculture expansion did not bring the promise of building infrastructures, and job creation in case where farmers were employed the terms of the contracts were set to bare minimum. Horne *et al.* (2011) reported similar cases where companies displaced people from their land for commercial production and promised employment and other development opportunities that influence landowners to agree the lease during the initial land transactions. But in contrary, there have been no reported statements or documents indicating how many jobs will be created or whether those jobs can compensate for lost income and decreased food suppliers. Hilhorst *et al.* (2011) argued that, the assumption that investment in agriculture may ensure job opportunity to the local community is wrong, as new job may go to migrants if local people lack skills or the discipline.

2.5.7 Social effects of large scale land acquisitions

2.5.7.1 Decline of food production

Food is the basic need and necessity of life that must be satisfied before any other developmental issue (John *et al.*, 2013). It has been noted that, farming households are the most affected in terms of food insecurity and poverty in Africa especially the smallholder

farming households though the rest of the population depends on their production. According to Cruz (2010) and Valdés *et al.* (2010), majority (more than 80%) of the smallholder farmers in the world are food insecure and depend on land as their primary source of livelihoods. For that reason, Guereña *et al.* (2014) highlighted that, investments in agriculture raised concerns in particular those that appear to be undertaken more responsibly, affect smallholder agriculture, access to land and food security. Land acquisitions for large scale *Jatropha* plantation, sugarcane, or palm oil for biodiesel or ethanol are an economically risky prospect for smallholders. Considerably numbers of literatures were critical as far as food security of smallholder farmers is concern. These include Wahl *et al.* (2009), Huggins (2012), and De Zoysa (2013). It is well understood that the number of poor and hungry people has been increasing, and the world now faces a major economic downturn. Climate change, growing competition for land, and the vitality of prices for food and inputs are having a negative impact on rural women and men in developing countries, and particularly on the poorer and most vulnerable households (Lundius, 2009).

Shepard *et al.* (2009) argued that one of the dangerous elements of large scale land acquisition is the shift from domestic to foreign control over food resources and food producing lands. This comes from the facts that, large corporate land deals reduce poor nations likelihood of reaching food self sufficiency and some view land concessions as government outsourcing food at the expense of their most food insecure citizens. It is evident that, two third of agricultural land deals entered into by foreign investors are in countries with a serious hunger problems (Geary, 2012). For instance, Madagascar, Sudan and Ethiopia are still receiving food aid relief from World Food Program. Food security in host countries were being undermined by raising demand for land mainly for *Jatropha*, sugarcane, palm oil for bio diesel or ethanol. Zeller *et al.* (2009) pointed out that explicitly

those crops would compete strongly with other uses of land that are important for food security, such as food crop production, grazing and wood fuel production.

A lot of critics have been evident as far as host countries food security and large scale land acquisitions are concerned. It has been put forward by different literature that, there has been a notable assumption hold by host government that foreign investments in agriculture present an opportunity to improve food security and living conditions in host countries of investment (IIED, 2011; Gerlach *et al.*, 2010 and Cotula *et al.*, 2009). However, according to Answeew *et al.* (2012) in Larsen (2012), 72% of the produce on acquired land is non foods, whereby bio fuels comprises 40% of the land, while forestry, carbon sequestration, mineral extraction industry and tourism account for 27% and other non food crops is 5%. Only 25% of acquired land is used for food production and 3% for livestock. Thaler (2013)observed further that, where large scale acquisition investment are focusing on producing food for external markets, they are not ensuring that at least some of this food remains behind for local use.

In some cases where some food is held back however, this can raise concerns over its impact on any local production that might be surviving as the large scale acquisition food is likely to be cheaper than that from local farms (Richards, 2013). Based on the existing literature some of the negative implications of large scale land acquisition on food security over local or smallholder farmers have already been observed in some of the countries both in developing and developed countries. Oxfam research in Cambodia has shown the negative impact of large scale concessions on the food security of local populations, especially women. Food security is further undermined by the diversion of crops from food to fuel (Thorpe, 2013). Center for International Research in Agriculture and Development and International Institute for Environment and Development (2011) insisted

that, large scale acquisitions are negatively affecting local livelihoods and food production, yet the model of capital intensive agriculture favoured by investors may provide few local jobs and other benefits, leading to intensified economic marginalisation and food insecurity.

2.5.7.2 Social conflicts

Land is increasingly becoming a source of conflicts in Sub-Saharan Africa, where land access had traditionally been characterized as relatively egalitarian (Yamano *et al.*, 2005). Some underlying factors such as population pressure, agricultural commercialization, and urbanization, have contributed to the increasing number of land conflict, and the current land tenure systems in Africa may not be well equipped to resolve such conflicts (Cotula *et al.*, 2004; van Donge, 1999). Number of scholars and activists have argued that, large scale land acquisition for commercial agriculture cause or is likely to cause nonviolent or violent social conflicts in form of protest, riots or small scale rebellion in response to the accumulation of land and enclosure of land (Arslan, Khalilian, and Lange, 2011; Von Braun and Meinzen-Dick, 2009; Meinzen-Dick and Markelova, 2009; Oakland Institute 2013 in Thaler 2013).The process of large scale land acquisition has created tensions and misunderstanding between local people and investors. In a number of cases unequal power relation, expropriation without compensation and lack of effective consultation were reported to be major causes of land conflict. Von Braun *et al.* (2009) argued that, smallholders who were displaced from their land cannot effectively negotiate terms favorable to them when dealing with such powerful national and international actors, nor can they enforce agreements if the foreign investors fail to provide promised jobs or local facilities.

In East African regions there is growing pressure for acquiring large tracks of land in the region for commercial purposes. Land deals are being implemented in Ethiopia, Uganda, Tanzania, Rwanda, Kenya and Burundi. Kironde (2012) identified several issues behind land conflict in the regions. These include loopholes in customary laws, national land policies legislation and institutions that are exploited to facilitate large scale land acquisition; rural communities lack knowledge and empowerment to deal with large scale land acquisition and the government plays a significant role in facilitating large scale land acquisition mainly through the principle of state ownership over land.

Conversely, Natural Justice (2012) observed that, increased large scale land conflict within and between indigenous people and local communities as well as with project proponents, are primary due to lack of fair and effective consultation, lack of full processes to seek free, prior and informed consent (including right to say 'no') and the role of coercive and manipulative tactics employed by companies and host government alike to ensure consent. In view of that, it is clear that large scale land acquisition have significant negative impacts upon the rights of indigenous peoples and local communities. The review of literature has raised a number of concerns over the effects of social conflicts to the local communities in productivity in developing countries. For instance, Castagnini *et al.* (2005) observed 5 to 11% productivity loss due to land conflict in Uganda. Practvuthy (2011) insisted land disputes in Uganda inhibit the productivity of small scale farms due to reduced cultivation, decreased investment and loss of economic assets. Furthermore, it has been reported that, death of a working-age male household head reduces the land allocated to high value crops and results in a large reduction in per capita household crop value production (Yamano *et al.*, 2004).

2.5.8 Potential benefits of large scale land acquisition on rice production

Several studies that have been carried out on large scale land acquisition have managed to highlight some of the potential benefits to the community around the projects. The positive effects mentioned in most of the literature include creation of employment, development of infrastructures, provision of social services like health services, water services, electricity and provision of education service and technological transfer. However, some prominent authors like Hilhorst *et al.* (2011), Milimo *et al.* (2011), Kachika (2011) and Fisseha (2011) observed that, most of the positive effects are still predictive as most of the projects are still in initial phases, and for those already under implementation very little has been done compared to the promises mentioned during the eviction of local communities.

2.5.8.1 Employment creation

Employment has been the most visible positive effect with regard to large scale agriculture investment in different countries. Several studies point out that, in most cases proponents of large scale land investment have mentioned employment as one of the most potential benefits for local community like that of (Cotula *et al.*, 2009; Gurara *et al.*, 2012; Boche *et al.*, 2013; Fisseha, 2011 and Richards 2013). Milimo *et al.* (2011) reported that, land commercialization for large scale agriculture in Zambia has successful ensured employment to 113 people. The creation of employment is a major reason for communities to accept or even welcome investors. But, many critics have been highlighted in some of the literature with regards to employment created in some of the projects that have already started the operation. Fisseha (2011) noted that, the type of jobs created is often criticized because of low wages and poor working conditions. Additionally, Hilhorst *et al.* (2011) reported that the number of jobs generated is relatively small once the land has been cleared, since mechanized farming is by definition not labour intensive. He

further noted that, in most cases employment generated depend on the type of crop grown because little labor is needed for such crops as maize and soya. This has been major problem as far as livelihood of the community who expected jobs to be their deliverance in most parts of Africa. It should be noted that these large scale agriculture investment are capital intensive which demand more skilled labour and use of machines therefore exacerbate the difficult conditions under which local people often operate by depriving them and thus increasing poverty (Ellen *et al.*, 2012). This has been observed in Cambodia and Indonesia where plantation attracted migrants from surrounding areas while local people were pushed aside (Susanti and Burgers, 2009; Prachvuthy, 2011 cited in Hilhorst *et al.*, 2011).

2.5.8.2 Development of infrastructures

The importance of rural infrastructure provision lies in its capacity to sustain daily activities including crop production, quality of life and economic base in the rural areas (Halseth and Ryser, 2006). There are urgent need for rural roads and other transport infrastructure, expansion of electricity grid and access to irrigation and the construction of storage and processing factories (Ellen *et al.*, 2012). It has been argued that, substantial increases in agricultural investments are essential in rural areas of developing countries where the majority of the world's poorest people live (Liu *et al.*, 2013). For that reason, well targeted investments, whether by foreign or domestic companies, can provide small scale food producers with more productive technologies, entry to higher value added markets, access to knowledge and market information, lower borrowing costs and financing to cover foreign exchange cost (Thorpe, 2013). Waterhouse *et al.* (2010) noted that, there have been some positive developments such as construction of much needed social and other infrastructures since host government started to encourage large scale land investment for agricultural production in developing countries. For instance, general

appearance of Macha area in Zambia has been improved as new buildings have been constructed after large scale commercialization of smallholder farming (Milimo *et al.*, 2011).

However, a number of studies have cautioned about the positive spillovers as far as large scale agricultural investment to the local communities. This is due to the fact that, in most cases the negative effects seem to outweigh positive ones. It has been argued one of the greatest challenges over the outcome of large scale land investment is lack of accountability among investors and unfulfilled promises to local communities. Polack *et al.* (2013) argued that, agricultural investments can contribute to economic development and poverty reduction. But evidence suggests that many investments have failed to live up to expectations including the development of infrastructures. Similarly, van Westen *et al.* (2011) cited in Hilhorst *et al.* (2011) argued that, there is often a long time lapse between acquiring land and seeing the results. Planned investments are often slow to develop or are postponed. Moreover, some newly acquired land is used for speculative purposes.

2.6 Factors for Low Rice Production

Rice is one of the leading food crops of the world. According to Ceesay (2004), it is the major staple for 2.7 billion people in the world, almost half of the total population of the global. Monty *et al.* (2009) argued that, Africa people consume more rice but is a minor player as far as rice production is concerned. This is due to the fact that, for a long time Africa is suffering from high yield gap in rice production. For that reason, there have been several writers who have talked about factors for low rice yields in Africa including Tanzania. Ngailo *et al.* (2007) noted that, drought, low soil fertility and poor seeds are among the reasons for decline of rice yields. Manneh *et al.* (2007) and Tran (1997) further observed that, abiotic stresses (drought, submergence, extreme temperature, and low soil

fertility) and biotic factors (weeds and diseases such as blast) together with land degradation and environmental pollution limits the continental rice production. On the other hand, Monitoring African Food and Agricultural Policies (2012) reported, lack of land suitable for rice production and the insufficient knowledge available in the new group of producers help explain the substantial decline in yields and stagnant growth in rice production. Similarly, Mghase *et al.* (2010) cemented that, low adoption of yield enhancing inputs (i.e. fertilizers and improved seeds) and technologies are the significant factors as large number of farmers still rely on rainfall and traditional seed varieties.

CHAPTER THREE

3.0 METHODOLOGY

Methodology is a framework that outlines the methods that are followed for research. According to Rajasekar (2013) Research Methodology are procedures by which researcher go about their work of describing, explaining and predicting phenomena. It is necessary for a researcher to design a methodology for the problem chosen. This chapter therefore, covers geographical location of the study area, research design, sample size, sampling procedures, data collection methods, instrument for data collection and data processing and analysis.

3.1 Study Area

3.1.1 Location of the study area

The study was undertaken in Kilombero District which is among the five administrative districts of Morogoro Region covering area of 73 325 km². Other districts are Morogoro, Kilosa, Mvomero and Ulanga. Kilombero District is located on the western side of Morogoro Region. The District lies between latitudes 70⁰40' and 9⁰21' South of the Equator and between longitudes 35⁰20' and 37⁰48' East of Greenwich. It borders with Kilosa and Morogoro Rural District to the North East, Mufindi and Njombe to Southwest and Kilolo District to the North, all of Iringa Region, Ulanga District to the South East (along Kilombero River) and Songea Rural District of Ruvuma Region to the South.

3.1.2 Climate

The district has high temperatures (hot weather conditions) and has bimodal rainfall patterns. Short rains begin towards the end of November and ends in January or February. Long rains usually start in March and ends in May or June. The average temperature in the District ranges from 26° to 32°C. The average rainfall ranges from 1200 to 1600mm.

Kilombero experiences seasonal flooding which causes some parts of the district to be inaccessible during the long rain season.

3.1.3 Population and economic activities

According to National Population and Housing Census of 2012, the population was 407 880 whereby 202 789 were males and 205 091 were females. The main occupation of the people in Kilombero District is agriculture. About 80% of the population is engaged in agricultural production, which is predominantly for subsistence. However, in recent years it is transformed to be more commercial. Rice, Maize, Peas and Bananas are the main food crops while sugarcane, sunflower and Cocoa are grown for commercial purposes. Livestock keeping is another economic activity and most livestock keepers are pastoralist and agro-pastoralists. Fishing is also regarded as economic activity even though not yet utilized to its full potential. It is undertaken in along Kilombero River and in small swamps found in Kilombero Valley.

3.1.4 Description of the study area

As it has already been mentioned, the study was undertaken in Kilombero one among the six administrative district of Morogoro region. Selection of Kilombero District was purposively based on three criteria; presence of large number of households engaging on agriculture as the main activity, high proportional of households producing rice as food and cash crop and existence of big agricultural projects that involved large scale land acquisition. Moreover Kilombero District has the highest percent of households involved in smallholder agriculture in Morogoro region (Chachange, 2010). Although, rice is planted in all districts of the region on a total of 169 762 ha Kilombero has the highest planted area amongst all the districts contributing close to half of regional planted area under rice production (URT 2007). Additionally, the increasing media reports about the entrance and presence of a large number of investors not forgetting the recent bigger project under the Southern Agricultural Growth Corridor of Tanzania (SAGCOT).

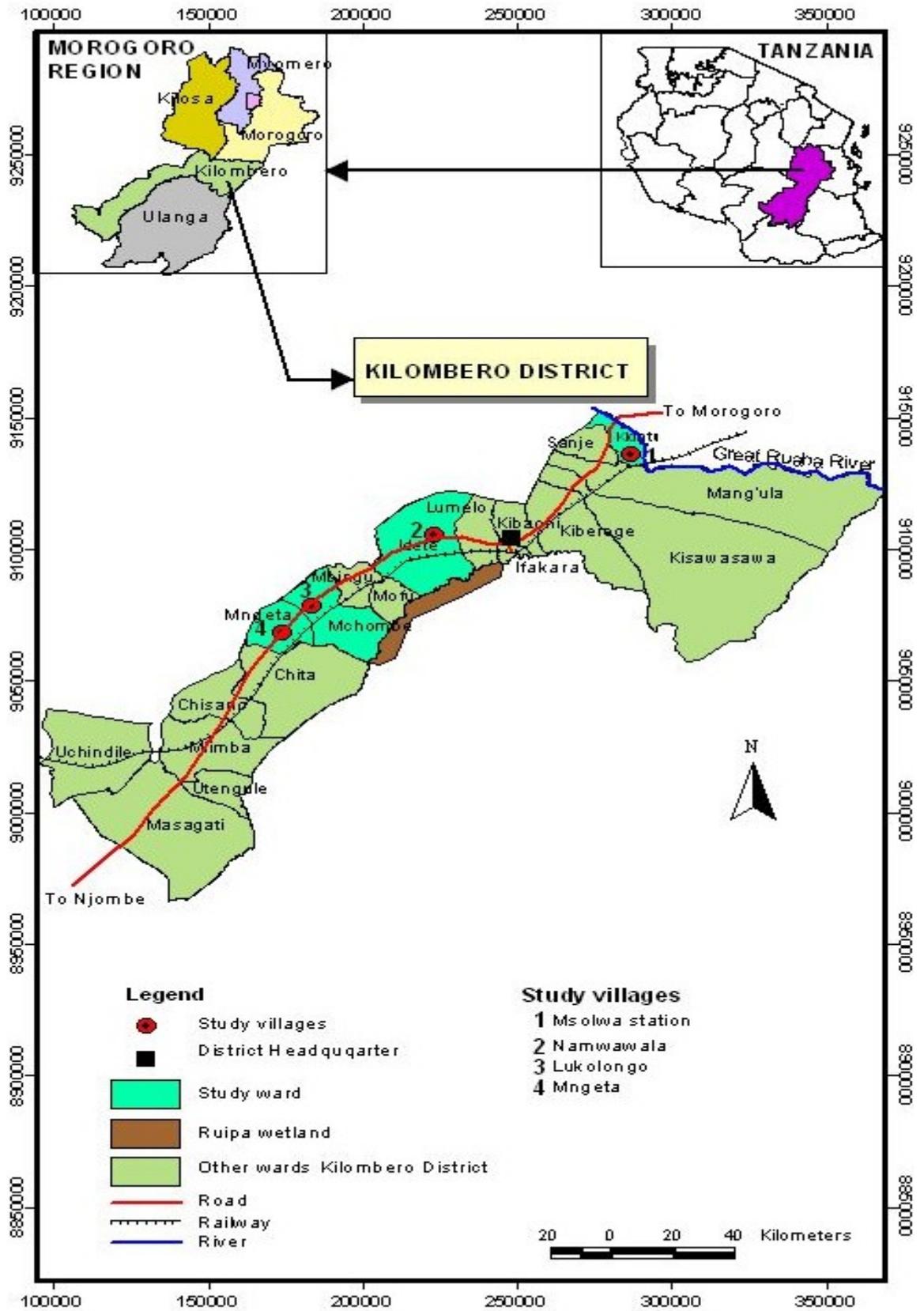


Figure 2: The Map of Kilombero District

3.2 Research Design

According to Burns and Grove (2009) research design is a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings. The purpose of a research design is to provide a plan for answering the research questions and is a blueprint for action. It is the overall plan that spells out the strategies that a researcher uses to develop accurate, objective and interpretative information.

For that reason, a cross-sectional survey technique was chosen for this study as it involves a close analysis of a situation at one particular point in time to give a snap-shot result on the effects of large scale land acquisition on rice production among smallholder farmers. A cross sectional survey design was chosen for this study for the following reasons: According to Neville (2007), cross-sectional studies are done when time or resources for more extended research such as longitudinal studies are limited. Moreover, it has been noted that the design is most appropriate for household survey as it facilitates the identification of the population of interest. The cross-sectional technique is recommended for descriptive studies and more specific for studies that analyze the relationship between and among the variables at a particular point in time. The cross-sectional research design however, has its own limitations. According to Mann (2013), the most important problem with this type of study design is differentiating cause and effect from sample association. Despite the limitations, in the researcher's view, the strength outweighed the weaknesses and a cross-sectional survey design was the appropriate design to adopt.

3.3 Target Population

According to Fellegi (2003), the target population is the population from which the information is desired. It is the collection of units that the client is interested in studying. Depending on the nature and goal of the survey, these units usually will be individuals,

households, institutions, farms or business. In view of that, the target population was ultimately be defined as all smallholder rice producers directly or indirectly affected by large scale land acquisitions in Kilombero District.

3.4 Sample Size Determination

Sample size determination is often an important step in planning a statistical study. In this study the total of 160 smallholder farmers engaging on rice production was selected as study sample. Two important criteria were considered much for the choice of the study sample. According to Lenth (2001), a sample size is important for economic reasons: An undersized study can be a waste of resources for not having the capability to produce useful results; while an oversized one uses more resources than are necessary. Moreover, Bryman (2004) point that consideration of sample size should be sensitive to the kind of analysis that will be subsequently required and heterogeneity of the population which imply, the greater the heterogeneity of population the larger the sample will need to be. In this case, 160 smallholder rice farmers' household heads were interviewed to collect the required information. The basis for selection of the sample size is provided in section 3.5 below.

3.5 Sampling Design and Procedures

Sampling involves a process of selecting a sub-section of a population that represents the entire population in order to obtain information regarding the phenomenon of interest. This study employed both probability and non-probability sampling techniques to obtain the study sample. According to Mugo (2002) the combination of mixed sampling methods helps in triangulation, allows for flexibility and meets multiple interest and needs.

3.5.1 Sampling procedures

A multistage random sampling method was used to select subjects to be involved in the interview.

Step 1

A purposive sampling technique was used to select 3 out of 5 divisions of the Kilombero District. The selected divisions were Ifakara, Mngeta and Kidatu. From 5 divisions 4 wards out of 23 wards were selected. The selected wards were Idete, Mchombe, Mngeta and Kidatu. Then from each ward four villages were selected which were Namwawala, Lukolongo, Mngeta and Msolwa station. The selection criterion was based on prevalence and magnitude of large scale land acquisition in the areas.

Step 2

Using a sampling frame of the households engaging on rice production for each village in Kilombero District 40 households were randomly selected. A total of 160 household from four villages were selected and involved in the interview conducted during the field work. The criteria for the choice of simple random technique were on deliberate concern that the technique requires that each member of the population to have an equal chance of being selected (Latham, 2007).

3.6 Research Methods and Instruments

Yin (2006) argued that, using mixed methods within the confines of a single study can simultaneously broaden and strengthen the study. In this study, both quantitative and qualitative methods of data collection were used to ensure the process of gathering the required relevant information. This subsection presents a set of methods and tools used to

collect information during the field work including Interview mainly Structured Interview; Observation; Focus Group Discussion and Key Informants Interview.

3.6.1 Data collection methods

3.6.1.1 Structured Interview

According to Bryman (2004), a structured interview entails the administration of an interview schedule by an interviewer. The reason for researcher to prefer structured interview is that it promotes standardization of both the asking of questions and the recording of answers. In this study, a face to face interview was done using a structured questionnaire as the data collection instrument. Since information was to be collected directly from the farmers' household heads, a questionnaire was the most convenient instrument for the survey. The questionnaire was administered to each respondent in exactly the same way in each of the four selected villages. The questionnaire was written in English and administered to the respondents in Kiswahili because all the respondents in four villages were speaking Swahili.

3.6.1.2 Observation

Observation entails the systematic noting and recording of events, behaviors and artifacts (objects) in the social setting chosen for study. According to Driscoll (2011) observation can be conducted on nearly any subject matter, and the kind of observation one might conduct will depend on your research questions. The result of observation may amplify the results of other forms of research by providing complementary evidence concerning individuals' true feelings. In this study direct observation, especially visits to farmers' rice fields and settlements living before large scale land acquisition and after large scale land acquisition in four villages were done. In practice, with an aid of a digital camera a researcher was able to record some important visual information that helped to justify the

effects of large scale land acquisition on rice production among smallholder farmers in the study area.

3.6.1.3 Focus group discussion

According to Khan *et al.* (1991), a focus-group discussion is an in-depth discussion in which a small number of people (usually 8-12) from the target population, under the guidance of a facilitator (moderator) discuss topics of importance for a particular study. It is basically a qualitative method in which the moderator, with the help of predetermined guidelines, stimulates free discussion among the participants on the subject of inquiry. In most cases, focus groups as a primary data collection method have been used as a follow up to a quantitative study, to explain, expand and illuminate quantitative data in order to gain some more understanding about the reason for certain findings.

It was on that ground, that the present study employed focus group discussion method as another method of data collection. On arrival in three selected village, of Namwawala, Mngeta and Msolwa Station the focus group discussions were conducted after carrying out individual interviews. Using a focus group guide questions (Appendix 2), the focus group was organized in a form of a deliberative debate where researcher asked questions to smallholder rice farmers purposively selected to participate. The purpose was to obtain more detailed information of the collected data from interviews made. Eight smallholder rice farmers with gender considerations were selected to participant in the discussions. In order to capture well the information required the discussion were guided by main researcher jointly with a research assistant. Moreover, to ensure successful discussion and collection of relevant information required, researcher developed a permissive non threatening environment within the groups and participants were free to expose their feelings and problems relating to large scale land acquisition on rice production. Since

data collection was done after harvest time, all of the three focus group discussions were conducted during the evening with an average of one hour and predominant used Swahili language because everybody in the study area understood and speak Swahili.

3.6.1.4 Key informants interview

Key Informant Interview is an in-depth interview of an individual selected for their first hand knowledge about a topic of interest (USAID, 1999). The interviews are loosely structured, relying on a list of issues to be discussed. The purpose of key informant interviews is to collect information from a range of people including community leaders, professionals or residents who first hand knowledge about the community. These community experts, with their particular knowledge and understanding, can provide insight on the nature of problems and give recommendations for solutions. As one of the data collection method the present study employed key informant interview. A total of 14 key informants were purposively selected and involved in an in-depth interview. With the use of an in-depth interview guide (Appendix 3) the information was collected from District Agriculture and livestock development officer (DALDO) (1), District land officer (1) and in each of the four villages of Namwawala, Mngeta, Lukolongo and Msolwa Station 3 key informants were selected for interview. The informants selected from each village were Village chairman (1), Village Executive Officer (1) and Extension officers (1) making a total of 12 informants from 4 villages. This was done mainly to compliment and obtained more clarified information collected in the fields.

3.7 Data Collection

According to Uganda Bureau of Statistics, (2006) data collection is the process of gathering and measuring information on variables of interest in an established systematic fashion that enables one to answer stated research questions, test hypothesis and evaluate

outcomes. In the present study both primary and secondary data were collected. ACAPS, (2012) noted that, both primary and secondary data can either be qualitative or quantitative. The difference is in the type of information collected, the questions and information requirements that the data is meant to address and the methods used to analyze it. For that reason, both qualitative and quantitative data were collected to address the study objectives.

3.7.1 Primary data

According to Heerden (2004) primary data are collected especially to address specific research objectives. A variety of methods, ranging from qualitative research to surveys to experiments may be employed to collect primary data. Smith *et al.* (2012) argued that, collecting primary data is vital in finding solutions to research problems. In the present study, all the primary data collected were reflected to objectives of the study. Before collecting primary data, household questionnaire was pre-tested in Sanje and Msolwa A villages by interviewing five households in each village in November 2013. The selection of these villages was based on similar situations to sampled villages. The purpose of pre-testing, the questionnaire was to check the validity of the instrument. Based on the results of the pre-testing, the questionnaire was adjusted accordingly (Appendix 1). Primary data collected were socio-demographic characteristics of the respondents, utilization of the land acquired, effects of large scale land acquisition on rice production, attitudes of smallholder rice farmers on large scale land acquisition as well as determinant factor for rice production.

3.7.2 Secondary data

According to Andersen *et al.*, (2011) secondary data refers to data that have been collected and made available by a primary source. Secondary data are often collected for a specific

purpose but can also be used to address questions in other fields of research. In addition, general repositories of data exist to aid researchers with factual statistics about a population of interest. To complement data collected from the primary sources, secondary data were also used in the present study. Secondary data such as past records on trends of smallholder rice production, records of number of large scale investors and size of land acquired for large scale farming were collected through reviewing literatures from various sources such as journals, books, reports from District Agriculture and Livestock Development Office (DALDO), internet and Research publications from libraries.

3.8 Data Collection Instruments

According to Kumar (2005) construction of research instruments or tools is the most important aspect of a research because anything researcher says by way of findings or conclusions is based upon the type of information collected and data collected is entirely dependent upon the questions that researcher ask respondents. The research tools provide the input into a study and therefore the quality and validity of the output, the findings, will solely depend on it. In the present study, in-depth interview was used to collect the qualitative data. Semi structured questionnaire or interview schedule of close ended and open ended questions was used to collect quantitative data. In-depth interviews involved 14 key informants while focus group discussions involved 3 groups. 12 key informants from four villages (1 extension office, 1 village executive office and 1 village chairman), 1 post for District Agriculture and Livestock Development Officer (DALDO) and 1 District Land Officer to make a total of 14 informants were purposively selected and involved in in-depth interviews. The semi structured questionnaire (interview schedule) was used to collect data from 160 smallholder rice farmers.

3.9 Data Analysis

According to Levine (1996) data Analysis is a body of methods that help to describe facts, detect patterns, develop explanations and test hypotheses. In the present study both descriptive and inferential statistical analysis were carried out with the help of Statistical Package for Social Science (SPSS version 16) and the following statistical analyses were performed in connection to objectives of the study.

3.9.1 Descriptive analysis

Descriptive statistics were used whereby qualitative and quantitative data collected from farmers were summarized, coded, and entered in the software programme of Statistical Package for Social Sciences (SPSS) version 16 spread sheets for analysis to give the quantitative description of information, frequencies and percentages were obtained and used to present results.

3.9.2 Inferential statistics

Paired sample t-test

According to Pallant (2002) paired samples t-test statistical technique is used when you have only one group of people and you collect data from them on two different occasions, or under two different conditions. The technique helps to evaluate whether there is a significant difference between means of two variables (test occasions or event). The present study employed the technique to measure smallholder rice production before and after loss of land. Using Kilogram per ha as unit measurement used in this study, prior to analysis the collected data of rice production was converted and analyzed with the use of SPSS computer software.

3.9.3 Multiple Linear Regressions

Multiple linear regression model was run to measure the combined effect of the several independent variables affecting smallholder rice production as well as the role of each variable in explaining the variance in the dependent variable. The factors used as predictors included respondent age (years), sex of respondents, respondents education level, respondents marital status, family size as the socio-economic characteristics of respondents and remaining were large scale land acquisition related parameters generated from the focus group discussion such as condition of road infrastructures, employment in large scale farm, farming knowledge, access to health services, access to water services, access to credits facilities, farm weeding and distance from large scale large farm. The dependent variable was annual rice production level per each farmers measured in Kg/hectares.

Model specification

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \dots + \beta_n X_{in} + \varepsilon_n \text{ (Field, 1997)}$$

Where:

Y_i = annual rice production level by i^{th} farmer measured in Kilogram/hectares

β_0 = constant of the equation

$\beta_1 - \beta_{14}$ = is the coefficient of the n^{th} predictor

$X_1 - X_{14}$ = Independent variables entered in the model

e_i = Random error term

X_1 = Age of household head (number of years)

X_2 = Sex of household head (0=female, 1=male)

X_3 = Marital status (0=single, 1=married)

X_4 = Education level (year's spending in school)

X_5 = Household size (number of people)

X₆= Farm size (area of land)

X₇= Access to credit (0=no, 1=yes)

X₈= Road infrastructure (0=not improved, 1=improved)

X₉= Access to employment (0=no, 1=yes)

X₁₀= Access to farming knowledge (0=no, 1=yes)

X₁₁= Access to health services (0=no, 1=yes)

X₁₂= Access to water services (0=no, 1=yes)

X₁₃= Distance (0= farm from large farm, 1=close to large farm)

X₁₄= Weeding (0=no, 1=yes)

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

The following section presents discussion of the findings of the study. The salient socio-economic characteristics of the respondents are briefly outlined to provide a broader picture. The chapter proceed with empirical findings on the extent of utilization of the land acquired for large scale farming, effects of large scale land acquisition on smallholder rice production, attitudes of smallholder farmers on large scale land acquisition and factors affecting rice production in the study area.

4.2 Socio-Economic Characteristics of Respondents

The socio-economic characteristics of respondent examined were age, sex, marital status, education level, occupation, household income, household size, farm size and land ownership and tenure system. These are discussed in the following sections.

4.2.1 Age of Respondents

Results in Table 1 reveal that most of the respondents were in age of 19-59 years. The findings reveal that majority of the respondents (81.9%) were within active age, suggesting more involvement in rice production activities. According to Adam *et al.*, (2013) people within such an age range are more likely to adopt new practices due to accumulated experiences in agricultural activities. Results also indicated that 18.1% of the respondents were above 60 years of age. The age group above 60 years is considered less productive because members of this group are too old to supply labour for production. Kalamata (2006) noted that advancement in age above 64 years reduces body strength to engage in farming activities, leading to retirement from active physical work.

Table 1: Age Group of the Respondents (n=160)

Age group	Frequency (n)	Percentage (%)
19-37 years	36	22.5
38-59 years	95	59.4
>60 years	29	18.1
Total	160	100.0

4.2.2 Sex of the Respondents

Based on Espen *et al.* (2006), sex refers to the biological characteristics that define human beings as male or female. Sex of the respondents was studied in order to find out the distribution of the respondents by sex and their involvement in rice production. Results in Table 2 show that 70% of the interviewed respondents were males whereas females constituted 30%. This suggests that, the highest proportion of the households engaging in rice production were male headed households. It is generally believed that, males are often more involved in energy demanding field activities (Oladeji *et al.*, 2005). However, the low percentage of female in rice production could be attributed by the cultural factors including lack of control over productive resources. Ayoola *et al.* (2011) noted that, marital responsibilities with associated cultural practices of seclusion prevent women from outdoor direct field production activities, particularly women who are within reproductive age.

Table 2: Sex of the Respondents (n=160)

Sex of respondents	Frequency (n)	Percentage (%)
Male	48	30.0
Female	112	70.0
Total	160	100.0

4.2.3 Marital status of respondents

Results in Table 3 illustrate marital status of the respondents whereby majority (81.9%) were married while 18.1% were single. In the present study, a single respondent denoted a person who is completely not married, divorced, separated or widowed. The reason to coalesce the four categories is based on the distinguished decisions that can be made between respondents in marriage and out of marriage. Married couples are likely to be more productive than single counterpart. Atibioke *et al.*, (2012) noted that, apart from generating children marriage serves as a means of generating a stable family labour who are able to participate in crop production, processing, marketing, farming practices and use of technologies related to marital status.

Table 3: Marital Status of the Respondents (n=160)

Marital status	Frequency (n)	Percentage (%)
Single	29	18.1
Marriage	131	81.9
Total	160	100.0

4.2.4 Education level of respondents

Results in Fig. 3: present the education level of the respondents whereby a significant percent of the respondents (66%) attained primary education, whereas 31% had no informal education, only 2% had secondary school education and only 1% went through adult education. These results therefore show that, a significant proportion of the respondents interviewed had basic primary education. Exposure to basic education is likely to increase farmers' ability to adopt improved agricultural practices if such an opportunity arises. Daneji *et al.* (2006) observed that, literacy level of farmers affects the degree or level of acceptance and subsequent adoption of improved farming technologies.

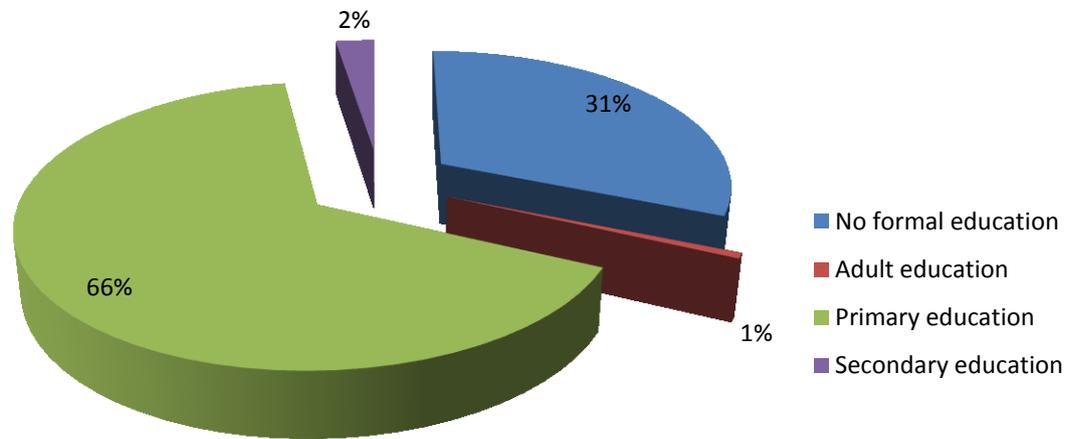


Figure 3: Education Level of the Respondents (n=160)

4.2.5 Occupation of respondents

Results in Table 4 present the respondents' occupation in the four study villages. The results reveal that, 99.4% were farmers who depend solely on agriculture activities including rice production and only 0.6% depended on off farm activities such as civil service. This suggests that, a significant proportion of farmers had no other means of sustaining their lives apart from farming. This is not surprising since majority of the people in rural areas are rural farmers engaging in crop and livestock production. These results concur with those of Siyao (2012) who observed that, agriculture provides employment to about 80% of Tanzanian rural population.

Table 4: Occupation of Respondents (n=160)

Occupation	Frequency (n)	Percentage (%)
Farming activities	159	99.4
Off farm activities	1	0.6
Total	160	100.0

4.2.6 Household size of the respondents

Results in Table 5 indicate household size in the study villages. The average household size was 5.99 persons. The smallest household had 1 person while the largest had 12.

Table 5: Household Size of the Respondents (n=160)

Item	N=160
Average	5.99
Standard deviation	2.272
Maximum	1
Minimum	12
% within household size category	
1-2 persons	5.6
3-5 persons	38.8
6 persons	21.3
>7 persons	34.4
Total	100.0

The number of people per household ranged from 1 to 12 persons with most households having 3 to 5 persons (38.8%), about 34.4% of households were having more than 7 persons, 21.3% of households had 6 persons while only 5.6 had 1 to 2 persons. This is likely to present enormous possibility for increased rice production due to availability of labour. Adam *et al.* (2013) observed that, household size influences the availability of family labour for agricultural operations, since the main source of labour for a typical traditional farmer is his immediate dependents, it is therefore expected that, household size would influence the adoption of agricultural technologies, especially where joint labour is needed. Moreover, Alarima *et al.* (2011) noted that, considerable large size of farming households could reduce the labour demand. However, due to large scale land acquisition

which is likely to evict farmers from the land, the results could suggest reduced labour force for smallholder rice farmers due to labour movement to large scale farming.

4.2.7 Source of income and income situation

Results in Fig.4: indicate respondents' sources of income in four study villages. In all of the respondents interviewed 99% derived their income from sales of own agricultural produces and only 1% derived their income from sources other than agriculture activities such as civil services.

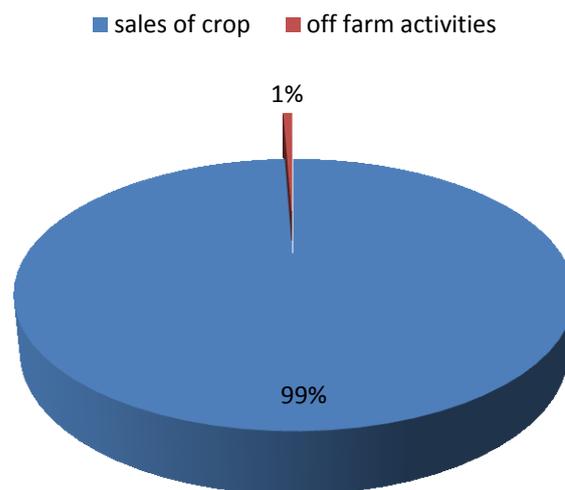


Figure 4: Source of Household Income (n=160)

These results suggest that most of respondent in the study area depend solely on agriculture to sustain their lives. These results agreed with those of Aikaeli (2010) who noted that, more than 80% of Tanzanians live in rural areas, and sale of food and cash crops is still most important source of cash income for rural households. However, the results suggest that if large proportion of land is taken by investors their livelihoods is likely to be affected.

Results in Fig.5: indicate that, a significant proportion of farmers (53.8%) had income ranging from Tshs 200 000 to 500 000 per year whereas 30% had income of less than Tshs 200 000 per year and about 16.3% had income of more than 500 000 Tshs per year. Generally, the results suggest that the majority of farmers in the study area earn low income compared to average per capital income of 570 USD which is about 900 600 Tshs (World Bank, 2012).

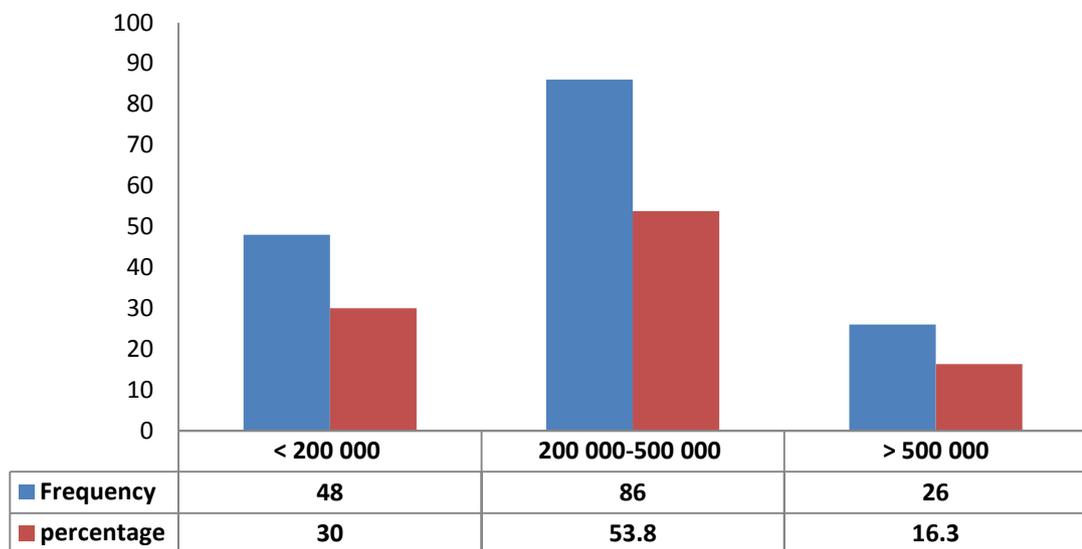


Figure 5: Household Income in the Study Area (n=160)

Chilowa (1998) indicated that most of smallholder farmers in Tanzania have low income due to low production. Low income is undoubtedly one of the major limitations of productivity of both food and cash such as rice. According to Odoh *et al.* (2009) farm income is among of the essential factors needed for agricultural production and with it; farmers can secure farm inputs such as farm equipment and hired labour. Furthermore, Omonona *et al.* (2008) noted that farm income is one of the intermediating factors between adoption of technologies and increased farm produces among the rural farmers. However, since majority of farmers depend solely on agriculture as main source of

income; these results suggest that their income is likely to decline following large scale land acquisition which possibly decreased land for crop production.

4.2.8 Land ownership and tenure systems

In order to determine land ownership and means of acquiring land farmers were asked whether they own land for crop production. Results in Table 6 indicate that substantial proportion (56.9%) do not own land in four study villages.

Table 6: Land Ownership in the Study Area (n=160)

Owens land	Frequency (n)	Percentage (%)
No	91	56.9
Yes	69	43.1
Total	160	100.0

Results in Table 7 indicate that 54% rent land, 25% bought land, and 15% lease land. Few obtained land through clearing of forest (4%) and 2% through inheritance. The results suggest that greater proportions of farmers have no land alternatively own land through renting and purchase. According to Randela *et al.* (2000) ownership of land can influence agricultural productivity, because farmers who do not own land can most likely to be reluctant to develop and maintain the land for meaningful crop production. Land ownership encourages farmers' long term investment decision on land and to adopt the best cropping system. Furthermore, Tenaw *et al.* (2009) and Shekiangio (2008) argued that, it is easy for farmers to access loan/credit facilities if land is to be used as collateral which is likely to enhance crop production. However, results suggest that with the persistence of large scale land acquisition for large scale farming ownership and tenure system is likely to extremely be restricted among the smallholder farmers.

Table 7: Land Ownership and Tenure System in the Study Area (n=160)

	Ownership of the land					Total
	Inheritance	Bought	Leased	Cleared		
				forest	Renting	
Village of the Msolwa respondent station	0	7	5	0	28	40
Mngeta	0	7	4	0	29	40
Lukolongo	2	6	3	3	26	40
Namwawala	1	20	12	4	3	40
Total	3	40	24	7	86	160

4.3 Land Availability in the Study Area

Land in traditional mode of production is the main input and farmers in most parts of the country consider that any person without access to arable land is essentially poor. According to land Act of 1999, land in Tanzania belongs to the Government. Farmers can only hold it under customary tenure system identified in village land. Analysis of information in Table 8 presents the total arable land available in each study village, size of land allocated for large scale farming and arable land remaining for smallholder farmers in comparison with total number of people in each village.

Table 8: Available Land and Proportion of Land used in Crop Production

Villages	Total Arable Land (ha)	Land occupied by investor (ha)	Remain arable land (ha)	Population	Ratio (ha)
Namwawala	11371.7	6371.71	4999.99	9551	0.2
Msolwa station	14270.97	9466.58	4804.39	8285	0.6
Mngeta	8861.72	5818	3043.72	6685	0.2
Lukolongo	13572	5818	7754	6734	0.5

Source: Kilombero District land office 2013

Results show that on average, farmer households' access 0.4 hectare of land of which (53.8%) is rented, 25% was bought and 15% is leased while only 4.4% is obtained through clearing of forest and 1.9% was inherited. Generally, results in Table 9 indicate that substantial proportion of land is rented pointing to a possibility of unsustainable land management in the study area.

Table 9: Land Ownership by Study Villages (n=160)

	Land ownership	Percentage (%)
Msolwa station (n=40)	Renting in	70.0
	Bought	17.5
	Leased	12.5
		100.0
Mngeta (n=40)	Renting in	72.5
	Bought	17.5
	Leased	10.0
		100.0
Lukolongo (n=40)	Renting in	65
	Bought	15
	Leased	7.5
	Cleared forest	7.5
	Inheritance	5
		100.0
Namwawala (n=40)	Renting in	7.5
	Bought	50.0
	Leased	30.0
	Cleared forest	10.0
	Inheritance	2.5
		100.0

These results further show that on average land available for smallholder farmers is relative smaller to requirement of land for smallholder farmer in Kilombero District and national average of 0.2 to 2.0 ha per household (Hingi and Tulayi, 2006) (Table 8). The

remaining land for smallholder is certainly not sufficient for a household with an average of 6 people (Table 5), and to accommodate various crops grown including rice production and other non agricultural activities. Evidence of land shortage is also provided by the results in Table 10 which indicate that most farmers carry on rice production on less than 0.2 ha.

Table 10: Distribution of Land in the Study Area (n=160)

		0-0.2 ha	0.3-0.9 ha	1.0-2.0 ha	>2.0 ha	Total
Villages	Msolwa	34	3	2	1	40
	Mngeta	32	7	0	1	40
	Lukolongo	31	3	0	6	40
	Namwawala	3	6	11	20	40
Total		100	19	13	28	160

Results of the focus group discussion (Table 11) indicated that large scale land acquisition for large scale farming, increase of population and increased conservation of reserved areas are major reasons for the decline of arable land among the smallholder households in the study villages. These results are therefore consistent with those indicated in Table 8, 9 and 10.

Table 11: Pair wise Ranking of Major Reasons for Decline of Arable Land in the Study Area.

	Large scale land acquisition	Population	Reserved areas	Score	Grade
Large scale land acquisition	X	Large scale land acquisition	Large scale land acquisition	2	1
Population increase		X	Population increase	1	2
Reserved areas			X		

4.3.1 Utilization of land acquired for large scale farming in the study area

In order to access the extent of the extent of utilization of the land acquired for large scale farming in the study area, utilization score index was developed. Using questionnaire interview respondents were asked to indicate his/her stance towards utilization of the land acquired for large scale farming. Utilization of land acquired was grouped into three categories as follows: (1) low utilization, being not developed or left idle, (2) partial utilization, being partly used and (3) high utilization being fully used in crop production (Table 12).

Table 12: Utilization Pattern of Land Acquired for Large Scale Farming

Utilization pattern	Score
Low utilization	1
Partial utilization	2
High utilization	3

The total score for a respondent was obtained by summing up the scores obtained on each utilization pattern. The minimum score respondent could score was 1 and maximum score was 100. Depending upon the extent of utilization of the land acquired for large scale farming, utilization were categorized as follows; low utilization ranged from (1-33%); partial utilization (34-66%) and high utilization (67-100%). The results in Table (13) reveals that, the overall utilization was partial (average score was 66.5). Majority of farmers (51%) reported that land utilization was partial, whereas (25%) indicated utilization was lower and (24%) reported that utilization was high.

Table 13: Overall Utilization Level of Acquired Land for Large Scale Farming in the Study Area

Level of utilization	Score (%)	Percentage (%)	Average
Low	1-33	24.0	
Partial	34-66	51.0	66.4
High	67-100	25.0	
Total		100.0	

The results of focus group discussion (Table 14) summarized the major reasons for low utilization of the land acquired in the study area. The major reasons were larger size of land hold, violation of land use contract, lack of monitoring system, growing demand of land assets and lack of clear farm plan.

Table 14: Pair wise Ranking of Major Reasons for Low Utilization of Acquired Land in the Study Area

	Large size of leasehold	violation of contract	Lack of monitoring system	Lack of farm plan	Demand of land asset	Score	Grade
Large size of leasehold	X	large size of leasehold	Large size of leasehold	Large size of leasehold	Large size of leasehold	4	1
violation of contract		X	violation of contract	lack of farm plan	lack of monitoring system	1	4
Lack of monitoring system			X	lack of monitoring system	lack of monitoring system	3	2
Lack of farm plan				X	Lack of farm plan	2	3
Demand of land asset					X		

According to UNDP (2013) the analysis of field and secondary data on utilization of land leased for commercial large scale farming in nations such as Ethiopia, Rwanda and Tanzania show that utilization rates are still very low. The major reasons contributed to low utilization include leasing of large size of land compared to the capacity of investors, lack of farm plan, lack of performance benchmark and monitoring system. Others are absence of regulatory instruments, land use guidelines, high tax incentive and failure to obtain agricultural loans.

4.3.2 Trends of rice production in Kilombero District

Assessment of rice production trends in the district level was carried out in order to gauge the effects of large scale land acquisition on rice production. Analysis of Information in Fig. 6: indicates trends in rice production for period of ten years in Kilombero District.

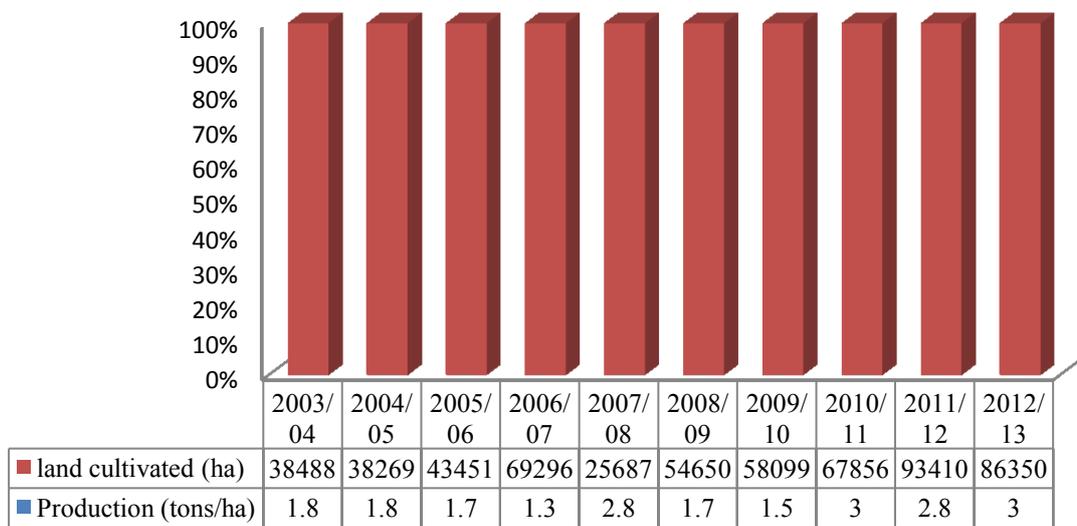


Figure 6: Trends of rice production in Kilombero District

Generally, the results indicate that rice production is far below the potential yield. According to PASS (2013) potential yield for rice in Kilombero District range from 1.9 to 4.0 tons/ ha. Results of the key informants indicated that reasons for the low rice yields include among others, insufficient land, pest and diseases, use of local varieties, dependence on rainfall, loss of soil fertility and poor agronomic practices (Table 15). The results indicate that apart from insufficient land other reasons for low rice yield were agronomic related.

Table 15: Pair wise Ranking on Major Reasons for Low Rice Yields in the Study

Area		Insufficie nt land	Pests and diseases	Use of local varieties	Dependen ce on rainfall	Loss of fertility	Poor agronomi c practices	Scor e	Ran k
Insufficie nt land	X	Insufficie nt land	Insufficie nt land	Insufficie nt land	Insufficie nt land	Insufficie nt land	Insufficie nt land	5	1
Pests and diseases		X	Use of local varieties	Pests and diseases	Pests and diseases	Pests and diseases	Pests and diseases	3	2
Use of local varieties			X	Use of local varieties	Loss of fertility	Poor agronomi c practices	Poor agronomi c practices	2	3
Dependen ce on rainfall				X	Loss of fertility	Poor agronomi c practices	Poor agronomi c practices	0	4
Loss of fertility					X	Loss of fertility	Loss of fertility	3	2
Poor agronomi c practices							X	2	3

4.4 Effects of Large Scale Land Acquisition on Rice Production

In an attempt to determine the effects of loss of land for large scale farming on rice production paired t-test was conducted to compare whether there is significant difference in smallholder rice production before and after large scale land acquisition. Results of computed paired t-test were statistically highly significance at $t=12.444$ ($p<0.001$) indicating that there is significant decrease of rice production following large scale land

acquisition in the study area (Table 16). The effect was large based on Cohen's conceptions (1988). The mean decrease in rice production was 3.14 at the 95% confidence interval level for the difference between the means of 4.61 to 1.47. The results are in agreement with those indicated in Fig.6:

Table 16: Effects of Loss of Land for Large Scale Farming on Rice Production in the Study Area

	Mean difference	Sig	t
Before large scale land acquisition	4.6061	0.000	12.444
After large scale land acquisition	1.4674		

The results are consistent with observation by Prachvuthy (2011) who noted that in Cambodia rice yield decreased by 60-70% as compared with years before land concessions were granted to the investor.

Using questionnaire interview respondents asked to indicate on effects on rice production following large scale land acquisitions. The results are summarized in (Table 17) the most effects mentioned were loss of arable land (53.1%), chemical damages (23.8%), serious fear on loss of land (16.9%) and increase of rice diseases (6.2%). The Chi-square test showed that there was strong relationships between the negative effects and rice production across the study villages ($p < 0.000$). The results are somewhat in agreement with those indicated in Table 15.

Table 17: Negative Effects of Loss of Land for Large Scale Farming on Rice Production (n=160)

Negative effects	Frequency (n)	Percentage (%)
Insufficient land	85	53.9
Chemical destruction of rice	38	23.8
Fear	27	16.9
Rice diseases	10	6.2

$\chi^2=21.30$; $p<0.000$

Results of Focus Group Discussion Table 18 confirm those indicated in Table 16. The results were also supported by individual remarks from FDG:

Godwin Mwamba 58 years old smallholder rice farmer in Mngeta village observed that, ‘since we were displaced in our land by KPL it has not been easy to obtain enough rice yields compared to the time before acquisitions took place.....’

Abdalla Malowe a 48 years old rice farmer in Msolwa station observed that, ‘I have lost all the land from the time when ILOVO displaced villagers for sugarcane plantation....now I fail to grow rice because land is very scarce in our village unless you rent from neighboring villages which is also very expensive consequently...I have lost income previous obtained from selling rice...’.

James Mwishagori extension officer in Mngeta village reported that, ‘there have been a notable effects on smallholder rice farms in this area occurred due to spray of herbicides like Round Up and 24D which are extremely potent killer of desirable plants...investor often use plane when applying herbicides because of size of the farm causing substantial damage on neighboring crops of smallholder farmers..’.

Table 18: Pair wise Ranking of the Negative Effects of Large Scale Land Acquisition on Rice Production in the Study Area

	Loss of land	Chemical damages	Rice diseases	Fear of losing land	Score	Rank
Loss of land	X	Loss of land	Loss of land	Loss of land	3	1
Chemical damages		X	Rice diseases	Chemical damages	2	2
Rice diseases			X	Chemical damages	1	3
Fear of losing land				X	0	4

Generally the results in Table 17 and 18 are somewhat similar to those reported by Prachvuthy (2011) in Cambodia where rice yields in smallholder farms had decreased by 60-70% following large scale farms. Rawat *et al.* (2011) found that in Polepally and Gundlagadda large scale farming caused reduction of local availability of farmland. Poulton *et al.* (2008) reported that large scale plantation agriculture has negative impact in smallholder farms due to excessive of improper use of inputs such as pesticides and herbicides leading to serious land degradation due to decreased microbial life.

4.4.1 Negative Socio-Economic Effects of Large Scale Land Acquisitions on Rice Production in the Study Area

Results in Fig. 7 indicate socio-economic effects associated with large scale land acquisition for large scale farming in four study villages. Using questionnaire interview, respondents were asked to point out socio-economic effects of large scale farming threatening smallholder rice production. The results show the most common effects were

land conflicts (29%), human diseases (21%), and loss of income (17%), loss of properties (17%) and food shortage (16%).

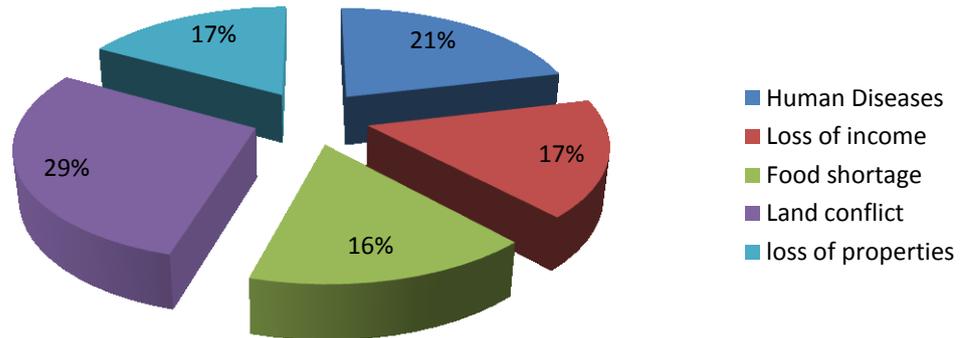


Figure 7: Negative socio-economic effects of large scale land acquisition on rice production in the study area

An attempt was made to estimate the relationship between negative socio-economic effects and rice production among smallholder farmers. The Chi-square test was carried out (Table 19). The results indicate that all the negative socio-economic effects analyzed were statistically significant at probability level of $p < 0.01$. These results suggest there are strong relationships between negative socio-economic effects and rice production in the study area.

Table 19: Chi square test of Negative Socio-Economic Effects of Large Scale Land Acquisition on Rice Production in the Study Area

Socio-economic effects	Chi square test	
	χ^2 value	Sig
Human diseases	89.66	0.000
Loss of income	70.53	0.001
Food shortage	75.30	0.000
Loss of properties	71.36	0.001
Land conflict	57.88	0.016

Results of the focus group discussion (Table 20) are supported by those pointed out by smallholder farmers in Fig.7: and Table 19 respectively.

Table 20: Pair wise Ranking of Negative Socio-Economic Effects of Large Scale Land Acquisition on Rice Production in the Study Area

	Land Conflict	Human diseases	Loss of income	Food shortage	Loss of properties	Score	Rank
Land Conflict	X	Land Conflict	Loss of income	Land Conflict	Land Conflict	3	1
Human diseases		X	Human diseases	Food shortage	Human diseases	2	2
Loss of income			X	Food shortage	Loss of income	2	2
Food shortage				X	Loss of properties	2	2
Loss of properties					X	1	3

Generally the results are similar to those reported by Castagnini *et al.* (2005) who reported that land conflict was a serious problem in Uganda for smallholder farmers. Similarly, Buntzel *et al.* (2013) found that, once land was taken for large scale plantation land conflict increased in Liberia. Research by OXFAM (2013) indicated negative impacts of large scale acquisitions of land on food security of local population especially women in Cambodia. Makochekanwa (2012) observed loss of properties among smallholders in Mubende after they were evicted from their land.

4.4.2 Positive effects of large scale land acquisition on rice production in the study area

The results in Table 21 show positive effects of large scale land acquisition in four study villages. Using a questionnaire farmers were asked to tell if large scale land acquisition by investor has brought any positive effects. The result indicates that most of the respondents (50%) reported there were no positive effects occurred following large scale farming. However, 23% of respondents reported that they have benefited from the improvement of roads whereas 19% indicated that they benefited from employment. About 8% of the respondents indicated that they benefited from technological transfers. It is therefore evident that a significant proportion of the farmers in the study area do not benefit from large scale farming.

Table 21: Positive Effects of Large Scale Land Acquisition on Rice Production in the Study Area (n=160)

Positive benefits	Frequency (n)	Percentage (%)	Chi-square test	
			χ^2 value	Sig.
None	80	50.0		
Road improvement	30.4	23.0	84.64	0.000
Employment	30.4	19.0	30.30	0.774
Technological transfer	12.8	8.0	35.96	0.518
Total	160	100.0		

The results are somewhat similar to those of the focus group discussion (Table 22) which ranked improvement of roads as a major benefit following large scale farming. However, other positive effects were not significant ($p < 0.05$). During the focus group discussions Edwin Mwakitapwa 46 years had the following to say;

“ since investor started large scale farming in our village, there has been improvement of the road from Isago, Kichangani to Mngeta Township...”

As far as employment is concerned farmers complained that even for the few jobs that were provided they were quite seasonal and only youth benefited. During the focus group discussion Amos Kijiwe 52 year’s rice farmer in Mngeta village had the following to say:

“to some extent job have been created by KPL in our village but a significant proportion of farmers who have lost their land do not get employment opportunities...”

The few farmers who indicated that they benefited from technological transfer cited improved seeds varieties (SALO 5 and TXD 306) and inorganic fertilizers as the key examples. These were mainly channeled through farmers group that was established by KPL. During the focus group discussion Magdalena Simon 42 years farmer group member and rice farmer in Mngeta village had the following to say:

“ KPL introduced SRI Farmer group which provides farming knowledge on the use of improved seeds (SALO 5 and TXD 306) and fertilizers... however fertilizers are too expensive most farmers cannot afford to pay 50,000 Tshs per 50kg bag.”

Table 22: Pair wise Ranking of Positive Effects of Large Scale Land Acquisition on Rice Production in the Study Area

	Road infrastru cture	Employment	Technologi cal transfer	Hospital	Water wells	Score	Rank
Road infrastructure	X	Road infrastruct ure	Road infrastructu re	Road infrastruct ure	Road infrastru cture	4	1
Employment		X	Employment	Hospital	Employment	2	2
Technological transfer			X	Technological transfer	Technological transfer	2	2
Hospital				X	Water wells	1	3
Water wells					X	1	3

Generally the results of positive effects of large scale land acquisition in the study area conform to findings by Milimo *et al.* (2011) who found that commercialization for large

scale agriculture created employment for about 113 people around the project in Zambia. Prachvuthy (2011) observed that there was improvement of roads in Bousra commune in Cambodia following large scale farming.

As a way of demonstrating key observations, several photos were taken. These are indicated in Plates 1 to 9. These provide photographic evidence of large scale farms, chemical damages of rice, labors employed in large scale farms and improvement of road infrastructures.



Plate 1: Large Scale Rice Farm in Mngeta and Lukolongo Villages



Plate 2: Large Scale Sugarcane Farm in Msolwa Station Village



Plate 3: Part of Undeveloped Large Scale Sugar Cane Land in Namwawala Village



Plate 4: Water Contaminated Sugarcane Chemicals in Msolwa Station Village



Plate 5: Rice Farmer along Large Scale Sugarcane Farm who his Rice Farm has been Affected by Chemicals moving from Large Scale Farm



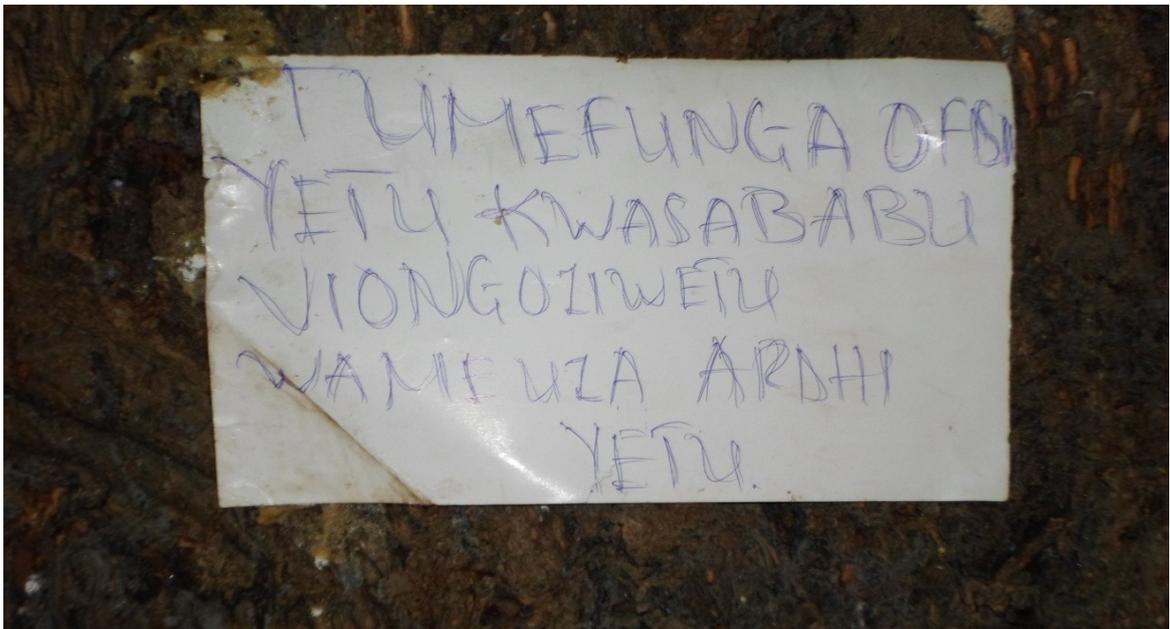
Plate 6: Improved Road Infrastructure Passing Large Scale Rice Farm to Kichangani in Mngeta Village



Plate 7: Improved Road Infrastructure from Kidatu to Msolwa Station Passing Large Scale Sugarcane Farm



Plate 8: Labors Working in Illovo Sugarcane Farm in Msolwa Station Village



**Plate 9: Poster on the Tree Villagers Blaming Village Government Selling their Land
in Mngeta and Lukolongo Villages**

4.5 Attitude of Smallholder Farmers on Large Scale Land Acquisition

Attitude towards large scale land acquisition among respondents were measured using Likert Scale which had 20 statements (Table 23). Every respondent was asked to indicate if he/she strongly agree (1), agree (2), neutral (3), disagree (4) or strongly disagree (5) with each item of the scale. The responses were grouped into three categories. Strongly agree and agree were grouped into agree; strongly disagree and disagree were grouped into disagree while neutral was left to stand alone. A total of twenty (20) statements were generated to show the frequency of attitudes towards large scale land acquisition for large scale farming. The score for agree ranged from 20-59 points, neutral lied within 60 points and disagree ranged from 61-100 points.

Fig. 8: shows that about 137 (85%) of farmers had negative attitude toward large scale land acquisition for large scale farming in the study area (that is, they scored between 61 to 100), 22 (14%) farmers had neutral attitude (that is, they had scored 60 out of 100) and only 1 (1%) had positive attitude on large scale land acquisition for large scale farming in the study area (that is, they had scored less than 60 between 20 to 59). The overall mean of farmers 'attitude toward large scale land acquisition was 73.83 out of 100 which implies that the overall farmers attitude toward large scale land acquisition for large scale farming was negative (unfavorable).

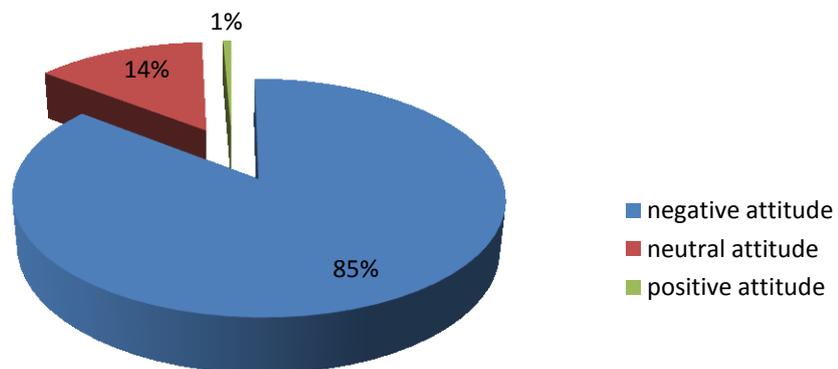


Figure 8: Three Categories of Overall Attitude toward Large Scale Land Acquisition in the Study Area

Results in Table 23 show that with exception of the responses of the fifth statement having 73.8% of 118 respondents, the rest of respondents in each statement disagreed with almost all statements that sought to measure their attitude towards large scale land acquisition for large scale farming in the study area. For instance the statements 1 to 4 and 6 to 20 with their corresponding frequencies as presented in Table 24 show that there were no differences in their attitude towards large scale land acquisitions.

Table 23: Attitude of Farmers on Large Scale Land Acquisition

No	Attitudinal Statement	Disagree	Neutral	Agree
1.	LSLA has no effects on Rice production	152 (95.0)	3 (1.9)	5 (3.1)
2.	LSLA did not decrease smallholder rice farmland	151 (94.4)	6 (3.8)	3 (1.9)
3.	LSLA does not cause shortage of food among smallholder farmers	149(93.1)	5 (3.1)	6 (3.8)
4.	LSLA does not reduce income from selling rice produce	153 (95.6)	2 (1.2)	5 (3.1)
5.	LSLA provides employment to People and smallholder farmers	37 (23.1)	5 (3.1)	118 (73.8)
6.	LSLA have done in a participatory manner	146 (91.2)	6 (3.8)	8 (5.0)
7.	Smallholder rice production have increase since take off of LSLA	146 (91.2)	6 (3.8)	8 (5.0)
8.	Community and smallholder Farmers have satisfied with LSLA as it ensure Provision of social services	153 (95.6)	4 (2.5)	3 (1.9)
9.	Usually communities and farmers have the tendency of attending meeting to discuss leases to Investor (s)	82 (51.2)	7 (4.4)	71 (44.4)
10.	LSLA has not led to conflict between investor (s) and farmers in the Village	154 (96.2)	3 (1.9)	3 (1.9)
11.	LSLA ensure effective compensation to farmers	145 (90.6)	11 (6.9)	4 (2.5)
12.	Legal procedure have been followed properly during land transfer to investor (s)	95 (59.4)	59 (36.9)	6 (3.8)
13.	Rice markets have been expanded since the take off of LSLA	147 (91.9)	12 (7.5)	1 (0.6)
14.	LSLA does not involve transfer of village land to investor (s)	103 (64.4)	51 (31.9)	6 (3.8)
15.	Access to farming inputs have been increased since take off of LSLA	131 (81.9)	12 (7.5)	17 (10.6)
16.	LSLA involves transfer of technology that increases rice	117 (73.1)	12 (7.5)	31 (19.4)

Loss of land	X	Loss of land	Loss of land	Loss of land	Loss of land	Loss of land	5	1
Unfulfilled promises		X	Unfulfilled promises	Unfulfilled promises	Conflict	Unfulfilled promises	3	2
Compensation			X	Compensation	Compensation	Violence	2	3
Loss of income				X	Loss of income	Loss of income	2	3
Conflict					X	Conflict	2	3
Violence						X	1	4

Generally the results are consistent with those of Prachvuthy (2011) who observed farmers' negative attitude towards large scale farming emanated from loss of land, loss of income and other properties.

4.6 Factors Affecting Smallholder Rice Production in the Study Area

Table 25 shows the effect of multiple regression analysis of the factors affecting smallholder rice production in the study area. Multiple linear regression represents a coherent extension of two variable regression analysis. So, instead of a single independent variable, two or more independent variables are applied to calculate the values of subject variables (Devonish, 2012).

In order to detect whether there is correlation among the independent variables collinearity diagnostics was tested. The term collinearity implies that two variables are nearly perfect linear combinations of one another. Ideally, predictor independent variables should be strongly related to the dependent variable, but not strongly related to each other (Pallant, 2002).

Results in Table 25 show Variance Inflation Factors (VIF) which measure how much of the variability of the specified independent variable is not explained by other independent variables in the model. In view of that, Pallant (2002) quoted commonly used cutoff levels for defining the presence of Multicollinearity (tolerance value of less .10, or a VIF of above 10). This is to say, if no X variables are correlated, then all the VIFs will be less than 10 (Table 25). If VIF for one variable is around or above 10, there is collinearity associated with that variable. This was not noted in the analysis (Table 25) which implies that there is no linear relationship existing between and among the independent variables.

Total of 14 explanatory variables were estimated in the analysis. Parameters were categorized into two main categories; the first five were socio-economic characteristics of respondents and the remaining were large scale land acquisition related parameters generated from the focus group discussion such as condition of road infrastructures, provision of employment, farming knowledge, access to health services, access to water services and access to credit facilities from investors.

Results in Table 25 show regression was significant ($p \leq 0.05$) and five independent variables account for 68.6% ($R^2 = 0.686$) of variation in rice production. These were farm size, farming knowledge, distance of small farm from large scale farm, condition of road infrastructure and farm weeding. Additionally, in an effort to see whether there is a relationship between large scale land acquisition parameters included in the linear regression and rice production a chi-square test was applied.

Table 25: Parameters Affecting Rice Production in the Study Area

Independent Variable (X)	Standardized coefficient		Collinearity Statistics	
	Beta	Sig	Tolerance	VIF
Constant		.124		
Age of HH	-.053	.399	.573	1.744
Sex of HH	.093	.088	.767	1.303
Marital status of HH	.007	.895	.746	1.340
Education level of HH	.072	.260	.549	1.822
Farm size ***	.258	.000	.645	1.551
Road condition***	.338	.000	.981	1.430
Employment	.063	.234	.801	1.249
Farm knowledge**	.103	.056	.787	1.270
Access to health services	.076	.174	.717	1.395
Access to water services	-.006	.917	.763	1.311
Distance**	-.177	.011	.469	1.133
Access to credits	.065	.197	.884	1.131
Household size	.143	.007	.827	1.209
Rice weeding***	.619	.000	.860	1.163

Note: * indicates significant at 1%, ** indicates significant at 5%**

Farm size was assumed to sustain a positive relation to rice production. That is, as farmers increase their farm area, their produces increase too, and vice versa. Likewise, the result of multiple linear regression analysis (Table 25) demonstrated that a unit increase of farm size will increase rice output by a factor of 0.258 and vice versa. This was highly significant ($p < 0.00$). This conforms to the findings of Obasi *et al.* (2012) and Ayoola *et al.* (2011) who observed that farm production increases with the increase of farm size. The results suggest that with the persistence of large scale land acquisition in the study area, farm size for smallholder farmers will subsequently decline leading low rice production. It is concluded that, policies and strategies that will protect smallholder rice farmers from losing their land will enhance rice production.

Farming knowledge was assumed to sustain a confident relationship with rice production among smallholder farmers in the study villages. That is, as knowledge of better farming practices increases through the role played by extension agents, it will eventually contribute to increased rice production. Multiple linear regression analysis (Table 25) showed that farming knowledge has a predictive power in explaining rice production situation. It indicates that, a unit increase of farming knowledge will increase rice output by a factor of 0.103 of the present production level. This was significant at a probability level of ($p < 0.05$). However, the chi-square results (Table 26) indicate that the farming knowledge provided to farmers was not significantly linked to rice production with $\chi^2 = 35.96$ and ($p < 0.531$). These findings suggest there is no linkage between large scale land acquisition for large scale farming and access to farming knowledge among smallholder farmers. This is perhaps because despite presence of large scale farming by investor in the study villages, only very few farmers have access to farming knowledge (20.1%) while majority (79.9) were not.

Distance of smallholder farmers from large scale farms (far more than 1 kilometre) was assumed to have positive relations to rice production in the study area. That is, as distance from large scale farm increases, it increases probability of obtaining more rice yields. This is perhaps because of decreased competition of water, land and frequent chemical damages from large scale use of herbicides and fertilizers. However, multiple linear regression analysis (Table 25) showed an inverse relationship of distance in explaining rice production. It shows that a unit increase in distance from large scale farm will decrease rice production of the present production level by a factor of -0.177. This was statistically significant at $P < 0.01$ (Table 25). This can be related to results in (Table 26) which indicates some of the positive benefits of smallholder proximity to large scale farms

included improved road infrastructure (46.2%), technology transfer (37.5%) and employment opportunities (16.3%).

Farm weeding was assumed to sustain a confident relationship with rice production in the study area. That is, the more farmers weed their farms the more rice yields increases. Multiple linear regressions analysis showed that frequency of weeding has a predictive power in explaining rice production among smallholder farmers. It suggests that a unit increase in number of weeding times increase rice production by a factor of 0.619 of the present production level. This was highly significant at a probability level of $p < 0.00$ (Table 25). Similar findings were reported in Malawi were frequency of weeding among smallholder farmers significantly increased rice production (Maganga *et al.*, 2012).

Road infrastructure was assumed to sustain a confident relationship with rice production in the study area. This is because improved roads infrastructure reduces transaction costs for both agricultural inputs and outputs (Temu *et al.*, 2002). Multiple linear regressions analysis (Table 25) showed that road infrastructure has predictive ability to explain rice production in the study area. It suggests that, a unit improvement of road infrastructure of the present level will increase rice production by a factor of 0.338. This was highly significant at a probability level of $P < 0.00$ (Table 25). These findings are consistent with those of Omotor (2009) who observed that road infrastructure was a determinant of agricultural output among rural inhabitants. The chi square test results (Table 26) indicate a significant link between the presence of large scale farms and improvement of road infrastructure in the study villages with ($\chi^2=89.64$ and $p < 0.00$). This is perhaps because the majority of farmers (74.8%) agreed that road infrastructure is one of the major positive effects of large scale land acquisition for large scale agriculture in the study area.

Age of household head, sex of household head, education level and household size were not significant factors affecting rice production in the study villages ($P < 0.05$) (Table 25). In order to determine connection between envisaged benefits emanating from large scale farming with smallholder rice production, chi-square tests were carried out (Table 26). The results indicate that out of six variables tested only road infrastructure and access to water were statistically significant ($P < 0.05$). The rest were not statistically significant.

Employment in large scale farms was assumed to sustain a confident relationship with rice production among smallholder farmers in the study area. Multiple linear regressions analysis showed that employment has no predictive ability in explaining rice production. The results were not statistically significant ($P < 0.05$) (Table 25). The chi-square test (Table 26) indicates there is no link between employment and rice production with $\chi^2 = 30.30$ and ($P < 0.05$). This is possibly because the majority of farmers (71.7%) indicated that they had never access to employment opportunities in large scale farms in the study villages (Table 26). The findings indicate that there is no link between the presence of large scale land acquisition and employment opportunities to smallholder farmers.

Access to health services (dispensaries and hospitals) is an important factor for maintaining labour productivity. With this view health services were assumed to be a critical determinant of household success in rice production in the study area. Contrary to this view, multiple linear regression analysis showed that access to health service has no predictive ability in explaining rice production. The findings are not statistically significant ($P < 0.05$) (Table 25). These findings are consistent with those reported by Temu *et al.* (2002) who observed that health services (curative and preventive) were not important in determining crop production. Similarly the chi-square test (Table 26) indicated that there is no relationship between health service and rice production with

$\chi^2=38.76$ and ($p<0.05$). This can be possible because in an effort to determine whether smallholder farmers have increased access to health services due to the presence of large scale farmers in the study area majority (61.6%) indicated that they don't have access to health services (Table 26).

Access to water, both for crop production and for domestic use, is important for crop production, health and sanitation. Access to water among smallholder farmers was assumed to have positive relations with rice production. Contrary to this view, multiple linear regressions analysis (Table 25) showed that access to water has no predictive ability in explaining rice production in the study villages. The findings are not statistically significant $p<0.05$ (Table 25). Similar findings were observed by Temu *et al.* (2002) who found that rural water service was not a significant factor for crop production ($p<0.06$). However, chi-square test (Table 26) indicates that there is a relationship between water service offered by the investor and rice production with $\chi^2=51.45$ and ($p<0.025$). From these findings, we infer that any increase in water service through number of water wells and improved water canals will likely to change the current situation. Currently very few farmers (21.4%) have access to reliable water services (Table 26).

It was assumed that access to credit facilities among smallholder farmers will increase rice production in the study area. This is because availability of credit serves to finance the procurement of material inputs which is an important production factor. Contrary to this view, multiple linear regression analysis showed access to credit has no predictive ability in rice production. The results were not statistically significant $p<0.05$ (Table 25). The results conform to those of Reyes *et al.* (2012) who observed that access to credit was not statistically significant in determining farm productivity. Similarly, the chi-square results reveal that there is no relationship between access to credits and rice production with $\chi^2=42.63$ and ($p<0.05$) (Table 26). This suggests there is no link between the presence of

large scale farms and smallholder farmers access to credits in the study villages. This is possibly because majority of farmers (84.4%) had no access to credit facilities (Table 26).

Table 26: Chi-square test on Relationship between assumed Large Scale Land Acquisition Variables and Rice Production among Smallholder Farmers in the Study Area

Parameters	%		Chi-square test	
	No	Yes	χ^2-value	P-value
Employment	71.7	28.3	30.309	0.825
Farming knowledge	79.9	20.1	35.962	0.531
Health services	61.6	38.4	38.766	0.390
Road infrastructure	25.2	74.8	89.644	0.000
Water services	78.6	21.4	51.459	0.025
Credits facilities	84.4	12.6	42.639	0.275

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

Previous studies in Sub Saharan Africa have pictured belief of the government that large scale land acquisitions have undertaken to achieve agricultural development including closing yield gap among the smallholder farmers. With reference to the outset positive motives behind large scale land acquisitions; this study so far was set out to examine effects of large scale land acquisition on smallholder rice production. The study was guided by the hypothesis which states that; large scale land acquisition for large scale farming does not have effects on smallholder rice production. Using paired samples t-test the study was able to reject the null hypothesis following significant decrease of rice production in the study area. Therefore, the study invalidates the prior concern as the practice of large scale land acquisition for large scale farming bears more negative effects on rice production than closing the sustained yield gap.

Basing on the study findings the following recommendations are prominent:

1. There should be proactive large scale land acquisition strategies that protect the rights of smallholder farmers by ensuring that investors do not hold on to land they do not utilize for many years. The mechanism should be put in place to allocate investors only the land they can utilize within a reasonable span of time and to withdraw land from investors who do not comply with agreed land development plans.
2. Agricultural land investments strategies should carefully evaluate what they are doing, there should be carefully evaluation of the negative and positive effects to smallholder livelihoods and agricultural production before land is granted to investors. Moreover strong watch dog instrument is fundamental in ensuring the

investments by investors deliver the expected outcome to majority of smallholder farmers and nation at large.

3. Increasing land scarcity in the study area suggests the need for sustainable rice production by both investors and smallholder farmer. There is need to carry out intensive agriculture that ensures sustainable production based on use of improved agricultural practices.
4. Investors' investments dividend in community development is fundamental in enhancing rice production. This should be through effective delivery of services such as roads, health centers and extension services.
5. Sustainable strategies should put in place to safe guard smallholder land ownership with titles which essentially will promote land management practices. Moreover, land entitlement to smallholder farmers will not only enhance crop production but will also help smallholder access to credit facilities and other agricultural technologies.
6. There should be deliberate efforts to ensure effective extension delivery. Extension service include a wide range of assistance to farmers in helping them to identify opportunities, tackle problems, assess capabilities and provide needed advice in terms of crop production improvement. It is the role of the government, private institutions (NGOs and CBOs) and investors to support extension workers working environment including transport facilities, good housing and demonstration facilities for farmers' field schools.

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APPENDICES

Appendix 1: Questionnaire

Effects of large scale land acquisition for large scale farming on smallholder rice production: The Case of Kilombero District

Section A: Household identification

Questionnaire number.....Date of interview.....Starting time.....Finish
time.....

Name.....Village.....Ward.....Division.....

SECTION B: Socio-Economic Characteristics

1. Age in years.....

2. Sex (1) Male (2) Female

3. Marital Status (1) Married (2) Single (3) Widowed (4) Divorce/separate

4. Education level

1. No formal education

2. Primary education

3. Secondary education

4. Post secondary education

5. Please tell us, the number of people in your household and their relation to the family

Age category (years)	Number of Males	Number of Females	Family relation	Total
0-18				
19-37				
38-59				
>60				

6. What is the main source of Income?

1. Sales of own production
2. Sales of livestock
3. Work off farm
4. Remittances

7: Which one of the following categories best describes your household's annual income?

1. Less than 500,000
2. 200,000-500,000
3. >500,000

8: Your full occupation?

1. Rural farmer
2. Self employed
3. Civil servants
4. Others (specify)

SECTION C: UTILIZATION OF LAND FOR LARGE SCALE FARMING

1. Did large scale land acquisition occur in your village?

1. Yes
2. No

2. If yes, who acquired land in your village?

1. Government
2. Foreign investors
3. Domestic investors
4. Others (please specify)

3. How do you describe the pattern of utilization of land acquired in the study area?

1. Low utilization

2. Partial utilization
3. High utilization
4. What type of crops are grown by investors in your village
 1. Rice
 2. Sugarcane
 3. Others (please specify)

SECTION D: EFFECTS OF LARGE SCALE LAND ACQUISITION ON RICE PRODUCTION

1. For how long have you been living in this village?
 1. Less than 5 years
 2. 5 to 10 years
 3. More than 10 years
2. If you moved from other place, where is your place of origin? Please indicate below
3. Why did you come to this place?
4. Do you own land (1) Yes (2) No
5. If yes, how did you acquire the land?
 1. Inheritance
 2. Bought
 3. Leased
 4. Rent
 5. Clearing forest
6. What is the size of your farm land?
7. For what purpose do you use the land?
 1. Grazing
 2. Rice production

3. Source of firewood

4. Others

8. For how long have you been engaging on rice farming in this village?

1. between 0-5 years

2. between 5-10 years

3. between 10-20 years

4. Others (specify)

9. Are you aware of large scale land acquisition in your village?

1. Yes

2. No

10. If yes, do you remember when did large scale land acquisition occur in this village?

11. Have you lost any useful land due to large scale land acquisition in your village?

1. Yes

2. No

12. If yes, what size of land you have lost due to large scale land acquisition in your village?

13. What size of land was under rice production before acquisition?

14. Have you been using the land to produce other crops than rice in your village?

1. Yes

2. No

15. If yes, what are other crops you have been grown? Please rank them

1. Maize

2. Beans

3. Cassava

4. Sorghum

5. Oilseeds

6. Others (please specify)

16. What size of land was used to produce crop (s) you indicate in question 15 above?

17. How many bags of rice you have been producing before large scale land acquisitions?

18. How many bags of rice do you produce after large scale land acquisition?

19. Is it easy to get new land today than before the take off of large scale land acquisition in your village?

1. Yes

2. No

20. If no, what has limited your access to farm land?

1. Large scale land acquisition

2. Increase of population

3. Increase conservation of natural resources

4. Others (please specify)

21. Have you rented in additional farmland from other smallholder farmers?

22. If yes, how large is the rented in land?

23. Does land rented in enable you to increase your rice production?

1. Yes

2. No

24. If no, what are the reasons?

25. Did you get any direct compensation due to the loss of land occurred in your village?

1. Yes

2. No

26. If yes, what kind of compensation did you receive from investor?

1. Money

2. House

3. Land

4. Others

27. Does large scale land acquisition have any direct effect on rice production in your village?

1. Yes
2. No

28. If yes, what negative effects on rice production

1. Loss of land
2. Chemical damages
3. Pest and diseases
4. Others (please specify)

29. Does large scale land acquisition associated with any other socio-economic effects that threatening rice production in your village?

1. Yes
2. No

30. Does large scale land acquisition cause conflict in your village?

1. Yes
2. No

31. Does large scale land acquisition cause health infections in your village?

1. Yes
2. No

32. If yes, which health problems?

1. Flue
2. Headache
3. Frequent coughing
4. Others (please specify)

33. Does large scale land acquisition cause loss of income in your village?

1. Yes

2. No

34. Does large scale land acquisition cause food shortage in your household?

1. Yes

2. No

35. What are other socio-economic effects associated with large scale land acquisition apart from those indicated in question 30,31,32, and 34?

36. Is there any positive effects of large scale farming in your rice production?

1. Yes

2. No

37. Does large scale land acquisition enable improvement of road infrastructure?

1. Yes

2. No

38. Did you get employment opportunity in the large scale farm?

1. Yes

2. No

39. Did you receive farming knowledge since introduction of large scale farming in your village?

1. Yes

2. No

40. Does large scale investor farm improve social services in your village?

1. Yes

2. No

41. If yes, what kind of social services

1. Water service

2. Health service
3. Schools
4. Others (please specify)

SECTION E: ATTITUDES OF SMALLHOLDER FARMERS ON LARGE SCALE LAND ACQUISITION FOR LARGE SCALE FARMING.

INSTRUCTIONS: Read each statement below. Circle the letter which best describes your response to the statement. If you **STRONGLY AGREE** with the statement, circle (1). If you **AGREE**, circle (2), **NEUTRAL** circle (3), **DISAGREE** circle (4), or **STRONGLY DISAGREE** circle (5).

S/N	Attitudinal Statement	1	2	3	4	5
1.	Large scale land acquisition has no effect on rice production among smallholder farmers in this village					
2.	Large scale land acquisition did not decrease the size of farmland used by smallholder farmers to produce rice in this village					
3.	Large scale land acquisition do not cause shortage of food among the people and smallholder farmers in the village					
4.	Large scale land acquisition do not reduce the income obtained from selling rice among smallholder farmers in the village					
5.	Large scale land acquisition provides employment opportunity to the people and smallholder farmers in the village					
6.	Large scale land acquisition has been done in a participatory manner					
7.	Smallholder rice production has been increased since large scale land acquisition occurred in this village					
8.	Community and Smallholder farmers has been satisfied with the large scale land acquisition took place as it ensure provision of social services in the village.					
9.	Usually the communities and smallholder farmers have the tendency of attending the meetings to discuss the process of leasing land to the investors in this village					

10.	Large scale land acquisition has not led to conflict between investors and smallholder farmers in this village					
11.	Large scale land acquisition that evicted smallholder farmers from their farmland has ensured effective compensation to the lost opportunities in the village					
12.	Legal procedures has been followed properly during the transition process of the land to large scale investors in the village					
13.	Markets of smallholder rice farmers in the village has expanded since the take off of large scale land acquisition					
14.	Large scale land acquisition did not involve the transferring of village or communal land to the hand of investors for large scale farming in the village					
15.	Since the take off of large scale land acquisition, access to farming inputs among smallholder has increased tremendously					
16.	Large scale land acquisition involved transfer of technology that increases rice production among smallholder farmers in the village					
17.	Smallholder farmers were ensured with better farming knowledge since the take off of large scale land acquisition for large scale farming in the village					
18.	Smallholder rice farmers were introduced to better farming practices that ensure excessive production of rice since the take off of large scale land acquisition in the village					
19.	Since the take off of large scale land acquisition access to new farm land has not been difficult than before					
20.	Technologies used by investors are user friendly to the environment hence it has no any environment impacts such as soil erosion and degradation					

SECTION F: FACTORS AFFECTING RICE PRODUCTION

1. Do you have access to extension services in rice production in your village?

1. Yes

2. No

2. If yes, how many extension contacts do you have in a period of a year?
 1. None
 2. Few
 3. Many
 4. Others (please specify)
3. Have you been introduced to the use of improved agronomic practices in your village?
 1. Yes
 2. No
4. If no, what are the current agronomic practices used in rice production?
5. Do you belong to any farmers' organization?
 1. Yes
 2. No
6. If no, why? Please specify
 1. Not exist
 2. Any other (please specify)
7. Do you have access to credits for rice production in your village?
 1. Yes
 2. No
8. If no, why? Please specify
 1. Distance from lending institution
 2. Lack of collaterals
 3. Difficult conditions
 4. Others
9. How many household members work in your farm?
10. Do you have access to farming inputs for rice production?
 1. Yes

2. No

11. If yes, what are the key inputs (please specify)

1. Fertilizers
2. Seeds
3. Herbicides
4. Planting equipments
5. Harvesting facilities
6. Weeding equipment
7. Others

12. What types of fertilizers usually used in your rice farm?

1. Organic
2. Inorganic

13. How many times do you apply fertilizer in your rice farm?

14. Do you usually weed your rice farm?

1. Yes
2. No

15. How many times do you weed your rice farm per season?

16. Do you have access to market for your rice produce?

1. Yes
2. No

17. What is the distance of your rice farm from large scale farm?

1. Less than 1 Kilometer
2. Far more than 1 Kilometer

18. Do you think being close or far from large scale farm has positive effects on rice production?

1. Yes

2. No

19. If yes, what kind of benefits? Please specify

1. Employment
2. Road Infrastructure
3. Technology transfer
4. Others (specify)

Appendix 2: Checklist for Key Informants

The Checklist questions used to address the Village Chairpersons, VEO, WEO, Extension officers and DALDO to obtain the overview of information of the study

PART I: Background Information

1. Are you aware of large scale land acquisition?
2. What is large scale land acquisition? When did it start?
3. Who is responsible with large scale land acquisition?
4. How many investors acquired land in this area?
5. Who are those investors? How do investors acquire land in this area?

PART II: Utilization of Land for Large Scale Farming

1. How is the land ownership in this area?
2. What is the total size of arable land in this area?
3. How much land has been allocated to investors in this area?
4. What is the average land size per household used in rice production?
5. How do you describe the use of land allocated for large scale farming in this area?
6. What are the types of crops grown by investors on the land allocated?
7. What are the factors for low utilization of land by investors?

PART III: Effects of Large Scale Land Acquisition on Rice Production

1. Are the rice farmers losing land due to large scale land acquisition in this area?
2. Where are rice farmers compensated due to loss of farmland?
3. Where have rice farmers relocated after large scale land acquisition?
4. Can you describe the rice production trends for the past 10 years?
5. Can you describe the current rice production in this area?

6. Do you think large scale land acquisition affected farmer's rice production in this area?

1. Yes

2. No

7. What are the negative effects on smallholder rice production?

8. In your opinion, how rice farmers have been benefited from large scale land acquisition?

9. Do conflicts have any effects on smallholder rice production?

10. What are the socio-economic effects associated with large scale land acquisition in the study area? How do they threaten smallholder rice production?

PART IV: Attitude of Rice Farmers on Large Scale Land Acquisition

1. How do smallholder farmers perceive large scale land acquisition in the village?

1. Positively

2. Negatively

2. If negatively, what are the reasons?

PART V: Factors Affecting Rice Production

1. Is there any contribution of the presence of investors in smallholder rice in the village?

1. Yes

2. No

2. If yes, what kind of contribution in rice production? (Please specify)

3. Are rice farmers use fertilizers for rice production? What type of fertilizer?

4. Are rice farmers provided with better rice seeds? Who supply these seeds?

5. Are rice farmers use hired labors in rice production in this area? What are the main sources of these labors?
6. In your understanding, are there any rice farmers group/ association/cooperative in your village? What are the benefits farmers get from being member of these groups?
7. Are rice farmers access markets of their rice produce? What are the markets challenges since the take off of large scale rice producers in the village?
8. How do rice farmers tilling their land? Have they being receive any support from investors?
9. How do rice farmers storing their rice produce? Are there any challenges that led to lost of their produce?
10. What are the common agricultural practices used by rice farmers? Does large scale land acquisition improved agricultural practices among rice farmers in this area?
11. Is there any technological transfer to rice farmers in this area? What are the types of technology adopted and methods of transfer that technology?

THANK YOU FOR YOUR TIME AND CO-OPERATION

Appendix 3: Checklist for Focus Group Discussion

1. How do you describe land ownership in this area?
2. Do farmers has right of land ownership in this area?
3. How do you describe the size of farms in this area?
4. Is there a land problem in this area?
5. Are you aware of the large scale land acquisition?
6. What is a large scale land acquisition?
7. When did it start in this area?
8. Who do you think are responsible with large scale land acquisitions?
9. How do you describe the use of land acquired in this area?
10. What are the reasons for low utilization of the land in the village?
11. Has large scale land acquisition had effects on rice production in this area?
12. What are the negative effects on rice production?
13. What are the general opinions of rice farmers on large scale land acquisition?
14. What is your personal opinion on large scale land acquisitions?
15. In your opinion, do large scale land acquisition had any benefits to rice farmers in this area?
16. What are the benefits of large scale land acquisition in this area?
17. Apart from large scale land acquisition, what are the other problems affecting rice production?
18. Is there any support that smallholder farmers have been receiving from investors in this area?
19. Is there any extension services been provided to smallholder rice producers in this village? What are the challenges farmers facing in accessing extension services?
20. Are the rice farmers receiving any financial support in terms of credits for rice production?

21. Are rice farmers use fertilizers for rice production? What actual amount of fertilizer is required for rice production?
22. Are rice farmers provided with better rice seeds?
23. Are rice farmers use hired labors in rice production in this area? What are the main sources of these labors?
24. In your understanding are there any rice farmers group/ association/cooperative in your village? What are the benefits farmers get from being member of these groups?
25. Are rice farmers access markets of their rice produce? What are the markets challenges since the take off of large scale rice producers in the village?
26. How do rice farmers tilling their land? Have they being receive any support from investors?
27. How do rice farmers storing their rice produce? Are there any challenges that led to lost of their produce?
28. What are the common agricultural practices used by rice farmers? Does large scale land acquisition improved agricultural practices among rice farmers in this area?
29. Who supply agricultural inputs in this area? Does large scale land acquisition improve accessibility of farming inputs in this area?
30. In your opinion, do you think large scale land acquisition cause conflict? How do rice production among farmers affected with conflict in the village?
31. In your opinion, are the distance of smallholder rice farm from large scale farms has any effect on rice production? What are the negative and positive effects you know?

THANK YOU FOR YOUR TIME AND CO-OPERATION