Perceptions and realities of biofuels investment in rural livelihood: the case of Kisarawe district, Tanzania.

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Master’s programme
Science for Sustainable Development

Master’s Thesis, 30 ECTS credits
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Abstract
Increasing demand for biofuel in the world as the means to mitigate global climate change, energy option and reduced fuel import expenses have attracted many companies to acquire land in developing countries like Tanzania. To invest on biofuel in Africa is believed to be a means for generating incomes from exports, to employ rural people, enhance infrastructure development. However, in Africa biofuel policy is still weak.

This study mainly focuses on people’s expectation during and after the investment. Issue of compensation procedure and promises seems to be a big problem; something brought tension of being cheated among local communities. Furthermore, community involvement and integration of jatropha with smallholder’s agriculture is also low.

Key Words: Biofuels, compensation, Jatropha, Land acquisition, Local community, Food insecurity
1. Introduction

The past several years have witnessed a rapid and accelerating expansion of biofuel production around the world. This is due to e.g. the rise of fossil fuels prices, increase on CO2 (carbon dioxide gas) emission and greenhouse gases, climate change, depletion of the world oil reserves. Furthermore, the fact that liquid biofuels can be blended with fossil fuels and become more compatible with current vehicles and distribution infrastructure adds to these effects (Sawe, 2007). Biofuel production is becoming a big issue as many countries are seeking alternative energy sources, which are more secure and environmentally friendly and at the same time will reduce energy import expenses (Cotula, 2009). Biofuel production depends on the availability of a number of raw materials, including the famed plant jatropha and other crops, while for a second generation biofuel the use of waste from domestic, forest, industries such as waste paper, rubbish etc. will be comprised. From a global perspective, projections show that global biofuels production is likely to continue expanding in the future (Martin, 2009). This expansion is driven by the rich nations as the means to mitigate climate change, support rural developments and new market opportunities (Cotula, 2008).

Furthermore, the demand for biofuels is projected to increase steadily from 167 to 880 billion liters between 2030 and 2050. The United States, the European Union, Brazil and China will account for one-third of the total demand (IEA, 2010). From these projections and expansions, biofuels has now become a business where countries are making strategic investments in energy production. The provided information based on the satellite imagery, suggests that Africa and South America has suitable land of 807 and 552 million ha, respectively, of which only 197 and 159 million ha are used for production (Cotula, 2008). Availability of free land has increased attention of many companies to invest in Africa. Both companies and investors organize their production in different ways with some basing strategies on small-scale farmers, who cultivate less than 2 ha, while organized through associations and cooperatives. Others rely on large-scale farmers through plantations, which can be owned by local investors, domestic or foreign companies, the government or a combination of large-scale farmers, linked with smallholders via out-grower schemes and contract farming arrangements (Sawe, 2007). This investment in Africa is believed to be a means for generating incomes from exports, to employ rural people, enhance infrastructure development, to generate profit for domestic and foreign investors and to reduce import expenses (Sawe, 2007).

Biofuels investment has rapidly become a serious issue and has initiated a heated discussion about how it will affect food security in the world, particularly in sub-Saharan Africa. For example, it has been suggested that biofuels investment will lead a majority of farmers to start concentrating on energy crops rather than on food crops while feed-stocks that are presently consumed by human beings will be diverted into energy crop production (Sulle & Nelson, 2009a). Putting emphasis on biofuels production rather than on food production will increase food prices. That would affect poor people in poor regions i.e. small farmers (net buyers of food) will not afford the expenses therefore leading, towards starvation. For example, in the United State when corn price went up the livestock keepers were forced to increase their meat price and that affected poor people as they couldn’t afford to buy meat at the high price.
China presently has about 100 million people who are vulnerable to food insecurity due to the increase of food prices (CICERO, 2009). According to IEA (2007:03): “Competition with food production for land use could drive possible increases in both ethanol and food prices (already occurring in the sugar market).” In contrast Cotula (2008), contend that rise of food prices in the world market has nothing to do with biofuels. Instead, they claim, it is mainly driven by change of weather and increased food demands e.g. in Asia.

However, in some countries, notably in Africa, villagers have reportedly been evicted from their land by the introduction of crops for biofuel production. Some of these villagers remained as company workers, while forgetting their fields. This, it is claimed, will not only result in food shortage but also that the remaining food will be selling at a high price which poor people cannot afford. Many reports are now claiming that, “biofuels production is driving millions of people into starvation” and that biofuels are a “crime against humanity” (Addison, 2008:05). Tropical rainforests have been converted into biofuels production land therefore productive land that could be good for food production, is now used to produce biofuels (ibid). According to Cotula, (2008), “the spread of oil palm in Indonesia has resulted in the clearance of 18 million ha of forest over the past 25 years”. Bischoff (2006) likewise reports that, diversion of the fertile land into biofuels production has exposed millions of poor people (approx. 30 millions) to food insecurity, and that this number is predicted to increase up to 290 million if no action is taken. Such effects have so far been found in Asia and Latin America and they do not necessarily have to be repeated in Africa. It all depends on whether energy crops can be combined with food crops and be integrated into smallholder agriculture. If that can be done, it seems unlikely that African smallholders should abandon food crops for the growing of biofuels.

It is today frequently argued that Africa has vast tracts of unused land that could be used for energy crops cultivation (Cotula, 2009). Cotula (2009), pointed out that 80% of the world reserve of agricultural land is in Africa and South America. He added that the findings provided by satellite imagery between 1995 and 1996, indicate that Africa has cultivatable land of about 807 million ha, of which only 197 million ha are under production. This shows that in Africa there is vast stretches land which is not in use, which is why most rich countries do not want to miss this opportunity for biofuels productions. Mbow (2010:22), however, finds this to be an exaggeration and points out that “much of the growth in land area under biofuels crops would come at the expense of forests and pasture”. Nevertheless, based on the belief that Africa has abundant land available for energy crops, about 110,000 ha of land in Mozambique has been earmarked for the growing of biofuels while the Ethiopian government has made 24 million hectares available for this kind of production (Knaup, 2008). In Tanzania, over 4 million hectares have been requested for biofuels investment, particularly for jatropha, sugar cane and oil palm, although only 640,000 ha have so far been allocated and of these only 100,000 ha have received a formal right of occupancy (Sulle & Nelson, 2009b).

Out of a total land area of 95 million hectares (Mha), Tanzania has about 55 Mha of land with a potential for rain-fed agriculture but only about 11 Mha are currently in use (Sawe, 2007). From this perspective it seems that Tanzania has enough land to produce both food crops and
biofuels crops. However, Tanzania has problems feeding its growing population largely due to government and donor neglect of agriculture during the last decades (Isinika, 2010). Farmers use poor agricultural methods and, with the present levels of technology adoption, cannot generally expand farm sizes. In this situation, it has been concluded that, “Tanzania has more than 30 million hectares of land classified by the FAO as very suitable or suitable for cultivation of energy crops with intermediate levels of input”, (Sawe 2007:04). Currently, the country has been approached by about 20 companies from UK, Germany, Sweden, Denmark, the Netherland and the USA and a few from Brazil and Indonesia who want to produce energy crops (Sulle & Nelson, 2009b; Mutch, 2010). These companies include: Diligent Tanzania Ltd- a Dutch company located in the Arusha region that has invested on 3500 ha for jatropha production; SEKAB Bioenergy Tanzania Ltd - a Swedish company expecting to acquire 22 000 ha in Bagamoyo district and 100 000 ha in Rufiji for large scale sugarcane production; and Sun Biofuels Tanzania Ltd - a UK company that has acquired 8 211 ha in Kisarawe district for jatropha production (Sulle & Nelson, 2009a).

Sub-Saharan Africa has a long history of food crises, although it was the major food exporter in the world in 1960. But immediately after the Asian green revolution, Sub-Saharan grain yields went down and have stayed flat. Africa, in term of food security, has become the most vulnerable continent in the world (Babu, 2007). Science and technology have been promoted in the past 45 years, however, without any major impact (Babu, 2007). African countries are facing poor agricultural institutions that would transform the agricultural sector into a more productive one. There is a need for long-term investments to build basic agricultural institutions in Africa in order to produce high yield food crops as many other countries have done. According to Babu, (2007:01) recognise significant increase of food crops yields: “The USA accomplished from 1860 to 1912, what Japan did from 1868 to 1914 and what many countries in Asia and Latin America have accomplished over the past 40 year”. Poverty in the African region has been increased time to time and now about 44% of the population, live under extreme poverty (less than one dollar per day) (Babu, 2007). Current projections show that, more than 38% of the population will continue to live in poverty by the year 2015 (ibid).

Blaming biofuels for food insecurity in Africa is unfair. So far biofuels have nothing to do with starvation in Sub-Saharan countries, because they are just being introduced and this region has a long history of being food insecure even before the introduction of biofuels. For example third of the total population in Sub-Saharan region were chronically undernourished in 1970 (IIASA, 2009). Putting the blame on biofuels is like hiding the truth or avoiding to recognize the realities, like farmers lack of knowledge, lack of extension service, use of poor agricultural inputs i.e. fertilizers, pesticide etc. Political leaders in Sub-Saharan Africa knows exactly what is behind all this and they should act immediately up-on it; first they have to support small-scale farmers, who makes up the majority of people living in the villages. African leaders and donors should be mobilized to on take long-term investment in science and technology suitable for small-holder farmers. This will likely increase cereal yields and productivity at the same time, which would improve smallholders income and thereby reduce poverty and food insecurity (Babu, 2007). This is because African agriculture is primarily
Based on smallholder farmers who receive less attention from their government. Because of this many of them rely on using poor knowledge which makes them continue production on the exhausted soil, with limited use of improved varieties of seeds and fertilizers. Also poor market infrastructure, too much dependence on rain fed agriculture and lost food during pre- and post- harvest have made them end up with low yields and small harvests. We all know that, having a huge productive land without good agricultural practices is like boiling an empty pot expecting to get a soup. Biofuel crops have to be grown and there is a lot of common ground between growing sustainable fuel and growing sustainable food (Addison, 2008: 10).

This seems to be the right time to develop an integrated strategy and policy that would provide good environment for biofuel production for the small-scale farmers. According to Sawe (2007), 70% of the African population depends on the performance of smallholder agriculture. Tanzanian agriculture is dominated by smallholder farmers with farm sizes ranging between 1 and 3 hectares and who provide food and income for almost 80% of the total population in the country, (FEWs Net, 2009). Therefore, putting effort to smallholder agriculture is the only way to work out from hunger and poverty in African regions (Sawe, 2007). Sub-Saharan Africa could learn from Asia’s green revolution, where small-scale farmers were supported by giving them high yielding seed varieties, extension services, good price for their agricultural product, technology and infrastructure (Holmen, 2004). On the other hand, not all African smallholders’ agriculture is low-productive. Studying yields of four important food crops, Larsson (2005) found yield gaps of about 60% between the 5% best performing small farmers and the average yields in the same villages. If the majority of smallholders could reach the same levels as their high-performing neighbours, more than half of the land they presently farm could be set aside for biofuels production without crowding-out food crops. According to IEA (2010), African countries need to modify their agricultural production and that would create a vast land for the biofuel production. The projection shows that, about 104 to 177 Mha would be available for biofuel production in the Sub-Saharan Africa, if the agricultural sector in the region would be more intense and efficient.

The crucial matter, then, is whether “the Sub-Sahara African Region could adapt some lessons from Asia to assist its agricultural development efforts with priority goal on self-sufficiency in food and fuels” (Sawe 2007: 02). That would allow smallholders to be more food sufficient and at the same time the surplus land can be used to produce energy crops that would create alternative sources of income. Moreover this can be done without invading marginal lands and therefore farmers may also find this to be a “win-win situation”.

This study focuses a particular area–Kisarawe - where a foreign company enters into a local community and invests in biofuel crops on a relatively grand scale. As this study shows, introducing biofuels investment into a Tanzanian poor community has been taken and valued like a “diamond”, where poor people see it as a solution to their overall livelihood problems. When the investors introduced this kind of investment in Kisarawe, people accepted the company with high expectations of getting a better life including having access to safe water,
health-care centre, roads, market, employment and agricultural support. Kisarawe is one of the communities, where people have high expectation on the Sun Biofuel investor due to what they have promised to do.

1.1. Research problem

Biofuels investment and production suggest that there will ultimately be rewards accruing to countries and investors that are engaging in this business. Tanzania has a history of investments in estate agriculture e.g. tea, coffee, cotton and sisal. The impact on local communities has often been in terms of being transformed into wage labourers and having their land taken away. Despite the potential of combining biofuels crops with food crops and, hence, with food security there is a risk that the current investments into biofuel crops will be history repeating itself, with small farmers, local communities, local authorities and ultimately the whole country being the least beneficiaries of such investments.

1.2. Aim of the study

The main justification for this research is to assess the perceptions about the new energy crops on the adjacent communities in Kisarawe. Although research has been carried out since 2006 on biofuels production in Tanzania, still there is little information on people’s perceptions and realities surrounding this new kind of investment. No specific indications have been shown to express the perceptions within poor households:- Instead there is only general information to predict future impact of biofuels on people’s livelihoods. Establishing expectations, perceptions and actual results at micro-level is important and this is the validation and significance for this master thesis.

1.3. Objective

1. To examine if and how local people were involved in and are affected by biofuel investments in a plantation scheme.

2. To assess the direct short and long term impacts of biofuel investments on local economy and livelihoods.
1.4. Research Questions

In order to meet these objectives, a number of more specific questions need to be answered:

1. How have peoples’ perceptions of biofuel (jatropha) investment been influenced?
2. What has been the effect of labour distribution in the affected area?
3. How have the villagers been compensated (if at all)?
4. How were people involved in and able to influence the investment procedure?
5. Has the biofuels scheme been integrated with smallholder food crops agriculture or do these systems live apart?

2. Material and Method

2.1 Sample design

Kisarawe district has 11 villages affected by the company, with total of 11,277 people. In this research, total of 105 persons from 4 villages (Vilabwa, Kidugalo, Palaka and Kurui) were selected. The four villages were selected because of their accessibility (located along the main road) and that these were become most affected by the company scheme. In each village a sufficient number of respondents (a minimum of 25 households from each village) were selected. This is to enable an understanding of the level of effect within a specific village and to make a general conclusion about these effects. The sample size was obtained by using two methods:

A) First a selective sampling, where by knowledgeable people in the study area were selected including the village leaders (2 each from three villages), 2 district officials and knowledgeable village members who were interviewed in a focus group way (group of 9 peoples from each of the three villages). Therefore, a total of 35 such respondents were interviewed. An additional of 30 people (combination of district, ward and village leaders) was also interviewed. This was a meeting arranged by the village leaders and agricultural district officer to discuss and express their feelings toward the investment issue within their community, which is why it was in a large group of 30 people.

B) The second method was a systematic random sampling, by using village registry lists where a total of 105 responding households were selected (both were affected by the company). The sample size was obtained by picking one unit in a random basis and then continued by choosing the additional elementary units at evenly spaced intervals until the desired sample size was obtained. As an example the village “Vilabwa” a total sample of 25 out of 1275 households were selected by systematically include all households placed on
number 51 (1275/25 = 51) on this village. Similarly, 26 out of 750 households were selected in Kidugalo (750/26 = 29) by accepting every households placed on the interval of number 29 in the list. In Palaka and Kurui it was the same procedure and in each village 27 out of 600 households were also selected.

The reason for interviewing 105 peoples only was due to the financial reasons and difficulties in reaching some of the households because villages households are scattered so sometime it took about 20 to 30 minutes walking before reaching the next respondents. Not only that, some respondent took about 35 minutes to understand and answer the questions, some started discussing their life history in the mid of discussion and at times they talked about poverty, starvation etc. All in all, a total of 170 respondents (individual, focus group and key-informants “big meeting”) were interviewed and the information provided from their responses was used to produce my thesis report.

2.2 Data materials

Both quantitative and qualitative data were collected from primary and secondary sources. Quantitative data was collected from village documents in order to find out the total number of the people affected in each specific village, land size acquired by the company, number of villagers employed by the company, level of food security and the compensation criteria used by the company. Qualitative data was collected from respondents and it was mainly to give people a chance to express their views concerning the whole issue.

2.2.1 Primary data

Primary data was collected from the field by using face-to-face interviews for both respondent (villagers, village leaders, district officials and company). The interviews were guided by a structured questionnaire, which consists of open ended questions and some closed. The structured questionnaire was supplemented by semi-structured and unstructured questions so as to be more sufficient. Probing and field observation was also conducted. The interviews involved villagers (individual household respondent and focus group discussion), village leaders, district officials and the company.

2.2.2 Secondary data

Secondary data was collected from different sources: scientific studies, government and district reports, literature, journals, newspapers and records from several district offices. Journals and articles from internet were also used. Information from secondary sources helped to create a state of understanding on the subject and to enable determination of missing knowledge about the subject.
2.3 Household interview

A total of 105 households from four villages were interviewed mainly to provide information to obtain a clear picture of the whole investment procedure and a general overview of the effects of investment within the studied community. Furthermore, it gave an insight into the community livelihood including living standard, house structure etc. Both selected house sample were affected by the invested project. Gender and age were also considered during the interviews.

2.3.1 Focus group discussion

Focus groups discussions were conducted in three villages, where in each case a group of 9 peoples were interviewed. These comprised two farmers, two livestock keepers, two businessmen, two teachers and one nurse. In the fourth village a large group of 30 people was interviewed. Although this is not an optimal size for a focus group discussion, meeting was arranged by village leaders and district agricultural officer for the main purpose of representing their villagers and give out their views toward possessed land, compensation and food status. Both male and female were involved in the focus group so as to avoid a gender bias. The focus group discussion was mainly conducted in order to obtain complementary information, which was made possible because of the enrolling of knowledgeable people, on how the villagers were involved in the whole investment process and what their perceptions towards introduced scheme was. Moreover the focus-group discussion was used as a “quick-fix” methods to understand the consensus and differences among villagers concerning the whole issue of investment and general community livelihood including food insecure etc. This discussion was guided by the open-ended research questionnaires, where everyone in the discussion was given a chance to speak and express their views.

2.3.2 Company, district and village leader interview

Representatives for the company, district officials and village leaders were also interviewed to get specific information on the invested project. From the company I needed to find out the whole procedure and the investment process. Thus, issues of expectations, land size, environmental impact assessment (EIA) and compensation were involved during the company interview. When it comes to village leaders it was mainly to get the information about the awareness among local people and their participation in the whole process of investment. This group was also asked to give the total area of acquired land in a specific village. Both these types of information were compared to those obtained from the company in order to know if the information’s provided were the same. The interviews of the district officials were
specifically done to understand their views on the investments in their roles of representing the government.

2.3.3 Data organization and categorization

For data organization and categorization both Statistical Package for Social Sciences (SPSS) and Microsoft Excel programs were used. Quantitative data were summarized to ensure that they can be in the form suitable for addressing both the research questions and the method of analysis used. This was done while ensuring the original meaning of the statements made by respondents maintained.

2.3.4 Observation

Field observation was taken on to see the project areas and how and where the jatropha plants were to be grown. The community observation was made to get an impression of how people live, presence and absence of facilities, establishments and institutions in the villages, etc. and their feelings concerning the whole investment issue.

3.1 Background

Introducing bio-fuel as a new energy option is mainly to improve national energy security, to promote rural development, to develop exports, to reduce oil imports, and to mitigate the impact of climate change. However, it can be used as an alternative energy option for traditional biomass fuels and for local small industries. Many countries are encouraged to adopt the renewable energy (biofuels) production. Integrating renewable energy in the national policy would easily increase the production although every country must make a good choice of which feedstock can be prioritized. For example biodiesel feedstock such as palm oil, sun flower, castrol oil and jatropha can be a good choice, since they require less extensive track of land and can be integrated with other crops like in Madagascar; jatropha is already grown alongside vanilla (Vermeulen, 2007). For this reason the government needed to conduct an assessment on how the production should be and how much it would cost and how to avoid all necessary and unnecessary impact. National policy needs to be designed in such a way that, both local communities and investors can enjoy the benefits “countries wanting to promote biofuels to reduce energy imports need to be aware of what type of polices they can actually apply to protect domestic production in terms of the international commitments (e.g. trade agreements) to which they are committed” specifically in less developed countries where biofuels policy still is weak (Vermeulen, 2007:59).
Biofuel production is dominated by the largest countries that have strong biofuel policies already in place, i.e. Brazil and the US together account for more than 70% of global production, in the year 2006 US produced about 20 billion litres of ethanol and Brazil produced 15 billion litres, which together is equivalent to 33% of the global production (Vermeulen, 2007). Western consumption is growing rapidly. “The European Union and the United States would account for the major share of biofuels imports; the US alone is projected to import 15 billion liters in 2020” (IEA 2004). Currently, the USA accounts for 31% of global bio-ethanol imports, while Brazil supplies about 50% of the global bio-ethanol demand (Vermeulen, 2007). However, some of developing countries such as Ghana and Sri Lanka also import biofuel from other countries, while Thailand, Malawi, Zimbabwe, Zambia and Mozambique have emerged as exporters of energy crops although in small quantities (Vermeulen, 2007).

The biggest private companies that invest in biofuels production are: D1-BP Fuel Crops which invest in Asia and Africa, Mission Biofuels Company based in Asia, Sun Biofuel Company investing in Ethiopia, Tanzania, Mozambique, and GEM Biofuels Company in Madagascar (Florida, 2008). However, many of the developing countries need to strengthen their skills in the biofuels production and also need to improve their physical infrastructures including roads, energy supply and water supply (IEA, 2010). It is argued that, having a proper policies in place, “the establishment of a sustainable biofuels industry is, therefore, a feasible way for (Africa) to decrease dependency on fossil fuel imports, improve (its) economic situation, and create new employment opportunities, especially in the agricultural sector” (IEA, 2010:23).

Any strategy used to promote biofuels need to be integrated within existing national policies. This involves different sectoral policies, sustainable development and poverty reduction strategies (IEA, 2010). National biofuel policies must clearly define whether the production is for domestic consumption or for export, transnational cooperation or domestic producers and which crop(s) to promote depending on its suitability, peak labour period, inter-cropping possibility and level of investment. When used specifically for domestic consumption there will be more investment in post-harvest processing (value added), which will provide more job to the local community. Moreover, it will diversify the labour market that in turn would improve people’s income. The government should also clarify what types of investments will be applied for a specific area in order to be assure that, all pillars of sustainability (environmentally, socially and economically) are well connected in a long-term plan, e.g. water management, food security, soil management and species protection (Cotula,2009). Having a strategic policy would obviously improve domestic market and increase access to the international market, which will increase national export income and reduce import bills.

Biofuels production in Africa is mostly based on large scale plantation although some of the investors are based on small-scale production, like Deligent Company in Tanzania is only giving technical support (extension services) to the out-grower, which after harvest sell the
crop to the company. African countries need to have a policy that would favour small-scale production (out-grower schemes, cooperatives, marketing associations, service contracts, etc.) simply because small-scale production provides greater opportunities including employment generation and poverty alleviation. Such a policy should create a good environment that would provide small-scale producers with technical support, create awareness, training, soft loans or loan guarantees and promote access to finance/credits (Vermeulen, 2007). On the other hand, bio-fuel production is dominated by large transnational corporations and many companies are mostly based on a large scale production mainly for export purpose rather than for domestic consumption. Market incentives existing in Africa are weak and it needs to be framed so that it can fit with large nations. However, at present the domestic energy consumption is too low to support such scenario. Hence, the temptation for transnational cooperation’s (TNCs) to opt for external markets.

There is a possibility of integrating biofuel crops, e.g. jatropha can be intercropped with e.g. ground nuts and beans to fight hunger. This can be done when jatropha plants is up to three years, for example successful intercropping have been observed in Senegal, where jatropha has been integrated with local bananas (Kagolo, 2010 ; UNF, 2008). Labour demand for energy crops production varies with type of the crop; some are more labour intensive throughout the production period, while others are labour intensive for a certain period. For example, Jatropha need a lot of labour during its initial growth, i.e. nursery, transplantation, first weeding and pruning. After that the demand is low and leaves the farmers the opportunity to continue with food production. According to Franken (2009:03) “jatropha seeds can be left on the trees and be harvested when labour is available”. Hence, there is great potential to produce bio-energy without interfering with food production. The situation is different with large scale production of biomass for exports using agricultural land”. This is when large area of agricultural land are dedicated to energy production and labour demand for energy and food production collide in time, can affect food availability. In this case the agricultural calendar should determine when labour is needed for plantation management, harvest and processing of food and biofuels to determine whether there are any conflicting claims on labour (Franken, 2009)

However, many researchers, scientists and journals have warned about this issue of leasing land to the biofuels investors without considering the food status within the poor communities. Cotula, (2009:90) added that:- “as much of the rural population in Africa crucially depend on land for their livelihoods and food security, loss of land is likely to have major negative impacts on local people. These may only partly be compensated by the creation of permanent or temporary jobs, while loss of land to the community is permanent; job may decrease as investment projects evolve towards less labour-intensive phases”. Nevertheless, many African governments are strongly encouraging both foreign and domestic investors to invest on biofuels feedstock’s (Cotula, 2010).
Biofuels can be produced from a variety of crops or feedstock including energy crops (e.g. jatropha, maize, oil palm and sugar cane), wastes (e.g. waste oils, food processing wastes, etc), agricultural residues (straw, corn etc), forestry residues and novel feedstock such as algae (EB, 2008). This study focuses on the jatropha plant, since the Kisarawe project is based on this plant. The jatropha plant was first introduced by Carl Von Linne in 1753, when he gave this plant a botanical name as a “Jatropha Ciurcas” from the Greek word “jatros” meaning a doctor and “trophe” meaning nutrition (Parajuli, 2009). This plant was first used by indigenous peoples in the Caribbean and Latin American and later spread into other continents, Asia and Africa, by Portuguese settlers. The plant has been used by the indigenous for about 200 years as a traditional medicine, while the seeds and leaves were used as a food (seeds for snacks and leaves cooked with meats) (Florida, 2008). Jatropha plants grow up to 8 to 10 meters height under favourable conditions. These species live up to 50 years and during the productive period (after 3 years) farmers can harvest seeds up to three times in a year (Janske & Romijn, 2007). The annual yield is about 3000kg/ acre or 3 kg of seeds per plant (Parajuli, 2009). In the 20th century, many nations began to see the importance of using jatropha oil as an alternative to petrol, after the rising of the world oil price. By 2005 the USA already had 95 operating plants with a capacity to produce 16 billion liters per year and in 2006 there was an additional 35 plants under construction (IEA, 2007).

Jatropha can grow in a poor soil with low nutrient content and can resist in any environments as it needs at least a minimum rainfall of 250- 500 mm. Although it is believed that optimal rainfall of 1 000 - 1 500 mm is sufficient. Is also known that jatropha has the ability to survive in very poor dry soils and even root into rock crevices (Brittaine & Lutaladio, 2010). Traditionally jatropha seeds are used as a medicinal plant especially against constipation, stop bleeding and the leaves are used as tea against malaria, while oil soap help to treat skin diseases like neuodermitis (ibid). Also, Henning (2004) added that, jatropha hedges around gardens can protect the crops against roaming animals like cattle or goats, to reduce soil erosion and as a source of shade for coffee plants. Apart from the potential yields from these crops there is some critique concerning jatropha plant farming, Benge (2006) has pointed out that jatropha has the potential to be weedy due to its toxic seeds that can spread rather easily and create dense stands on uncultivated lands as observed in Australia, Brazil, India, Jamaica, Puerto Rico, and Salvador. He also added that, jatropha seeds can be poisonous and it can cause acute abnormal pain, nausea and ingestion upon entering the alimentary system. Benge (2006:14) “Jatropha Ciurcas can transmit cassava superlongation disease and another species *J.multifida*, is an alternate host plant for African Cassava Mosaic Virus, which is transmitted by white flies and it can be assumed that this also applies to *J. Ciurcas*”. 
United Republic of Tanzania is located in east Africa and the country contains a total area of 945 090 km$^2$ (367 900 sq mi) including 59 050 km$^2$ of inland water. About 80% of the total area is covered by woodland, grassland and bush land, while 40 million ha are counted as a potential arable area (FEWs Net 2009). However, only some 11 Mha are currently under use (Sawe, 2007). From this perspective, Tanzania has enough fertile land for sustaining its population food demands, which presently is not in use. According to Sawe (2007:04) “Tanzania has more than 30 million hectares of land classified by the FAO as very suitable or suitable for cultivation of energy crops with inter-mediate levels of input”. The Tanzania biofuels guideline (2008:08) contends that, “Tanzania has an environment conducive to the farming of crops for production of biofuels (energy crops)”. Climate varies from tropical along the coast to temperate in the highland and is characterised by two types of seasonal rainfall distribution: a unimodal type, where it is usually raining from October to May within the central, southern, south-western highland and western part of the country; and a bimodal type, which comprise two seasonal rains from October to January (short rain) and from March to June (long rain) within the coastal belt, the north-eastern highland and Lake Victoria basin, (FEWs Net 2009). Uneven rainfall distribution has resulted in spatial and temporal non-viability of water supply, which presents a hindrance to agricultural production, especially in semi-arid areas where the rainfall is less than 600mm (Kapinga, 2004).
This problem has put 1.9 million people into hunger, whereby there is the need of some 77 million tonnes of food to assist them (Tanzania Food Security, 2004). The “rainfall situation has worsened in recent years due to often recurring periods of drought, forcing the government to import increasing amounts of food aid directed mainly to the north-eastern part of the country” (IEA, 2010:174). This happens despite agriculture being the leading sector in Tanzania’s economy, employing 70% of the country’s labour force and providing food and income to the rural population (WFP 2009). Agriculture is dominated by smallholder farmers, who cultivate 1-3 ha. Most of them are poor knowledge on production (IEA, 2010). Therefore there a need to support smallholder’s farmers, who feed the majority of the country. Otherwise this nation will never work out of hunger. Isinika (2010) pointed out that, use of fertilizer and other agricultural inputs in Tanzania are weak i.e. 60% of the farming households use hand hoe, facing low market support, lack of credit and extension services. It is the time for the Tanzanian government to implement good agricultural methods that would help smallholders to attain high yield harvests; and to develop supplementary income sources e.g. biofuels.

When it comes to the energy use, the main energy supply in Tanzania is biomass which provides 89%, petroleum 8% while natural gas provides 2%. Apart from depending on biomass for energy production, the country strongly depends on oil import and, thus, brings worries over increasing oil price (IEA, 2010). In 2003 to 2005, the value of national petroleum imports was increased from US$ 400 million to US$ 1 billion (URT, 2008:08). Developing domestic energy supply, including all type of biofuels crops, would reduce high dependence on oil imports at the same time as CO₂ and green house emission will be reduced. However, Tanzania, like many African countries, has no experience or knowledge of biofuels production. However, some few places people have used jatropha plants as grave markers and as fences around gardens to protect crops against roaming animals (Janske & Romijn, 2007).

During the years 2000 to 2003, biofuels crops started to gain attention in the country after many companies requested for land in the country. Although the country has no official policy that would govern and control biofuels development activities (Janske & Romijn, 2007), a national biofuels task force was established in March 2006 under the guidance of the following ministries: ministry of energy and minerals (MEM); the vice president’s office; the ministry of labour; the ministry of finance; the ministry of water and irrigation; ministry of natural resources and tourism and the ministry of agriculture, food security and irrigation (IEA, 2010 & WWF 2008). The main purpose of the task force was to promote biofuels production, designing biofuels policies and regulation, encouraging outsider investors through identifying potential areas for biofuels production (IEA, 2010). Also the draft explaining all the potential benefits that would be gained through biofuels investment stressed their “potential to halt deforestation and desertification, as they involve drought resistant crops like jatropha, sisal, cassava and sweet sorghum” (WWF, 2008:16).

In 2008, the national task force was modified and a national guideline for biofuels investment was developed. The guideline focuses on biofuels investment activities including application
and registration procedures, blending of biofuels, taxes and incentives, land acquisition procedures and on facilitating good environment for biofuels investment etc. (URT, 2008). Although the country has identified many opportunities to attract both local and international companies to invest in the energy production, there are still discussions going on whether to use this product domestically or for export. There is a fear that strong investors would benefit, while poor communities being the least beneficiaries (IEA, 2010). However, the government fears that farmers may divert from producing food crops into farming energy crops, especially when biofuels market provide them with a good price. So far, the government, thus, seems unwilling or at least being hesitant to integrate biofuels crops with smallholder agriculture.

On the other hand, many researchers have pointed out that a negative impact of biofuels on food security would only be observed if the production expenses of energy crops will be cheaper than those of food production in terms of labour and resources (WWF, 2008). “Introducing price incentives to the growers to cultivate sugarcane, the chances are that many will shift to sugar cane and devote less time to food production or leave food production to women and children” (WWF, 2008:29). So to make sure that this problem doesn’t appear, it is very important to encourage integration of smallholder’s agriculture with energy crops production, whereby farmers can combine both energy crops and food crops in their fields. For example “Diligent have also been encouraging farmers not to stop food production by promoting intercropping. Intercropping is also being seen as a way of avoiding food security issues in areas where Croton megalocarpus will be grown as the trees have open canopy architecture that also allow food crops to be grown”. (WWF, 2008:30). Furthermore, if the government would think of adopting second generation biofuels production, which totally depends on the residues from different crops, that problem could be prevented (IEA, 2010).

3.1.2. Tanzania Land Policy

According to the Tanzania Land Act No.4 of 1999 and Village Land Act No. 5 of 1999, any land which is used and occupied by the local communities belong to the village community “village land” and normally this land is under managerial authority of the village council. Most of the land obtained or in the process of being obtained by biofuels companies has been village land that is not permanently settled, but still used by village members (Biopact, 2007). Village land may not be allocated to investors unless legally it has been transferred to general land (unoccupied or unused land), which usually belongs to the State under authority of commissioner of land in the Ministry of Land, Housing and Human settlement Development (Sulle and Nelson, 2009a). Village land can only be transferred to general land by the president, and then only after the affected villagers and commissioner of land have agreed on the compensation to be paid. Thereafter, general land can be allocated to the investor by the Tanzania Investment Centre (TIC) immediately after given derivative right for a specified period of time (URT, 2008). “Long term derivative rights and leases range between 5 to 98 years. However, in recognition that biofuels technologies are changing very fast, from first to second and third generation, land tenure for biofuels production will range from 5 to 25 years” (URT 2008: 29). According to the guideline, land which is allocated to investors must
be reviewed by the steering committee in order to ensure that aspects of sustainability (social, economic and environmental) were put into consideration (URT, 2008)


- Apply for approval of land from the Commissioner for Lands by presenting the required documents plus the endorsement letter for biofuels project from Biofuels Steering Committee through Biofuels One Stop Centre.
- In order to ensure the land rights of villagers, the village authorities shall be guided by Biofuels One Stop Centre on the procedures and restrictions of giving land to investors once the biofuels project is approved to their areas by Biofuels Steering Committee.
- Procedure for acquisition of land by small out-growers is provided under village Land Act, 1999 and/or Land Act, 1999. In dealing with land issues, the Ministry of Lands and Human Settlement Development and TIC shall ensure that at any given time, majority ownership of land remains in the hands of Tanzanians.
- As far as biofuels are concerned, the investor/developer shall use land for specified energy crop(s) and not otherwise. In case of any change of use, the investor/developer must apply for re-grant, which is not automatic. Land management practices to ensure sustainable agriculture e.g. crop rotation, intercropping, should be separated from Change of Use policy.

Although the Tanzania government has a policy, which guides all forms of investments, the whole process of land acquisition for biofuels investment seems to be done behind closed doors. Lack of transparency is the main problem facing the Tanzania government (Cotula, 2009). The government uses a top-down approach in making all the decisions and agreements without involving the local communities. Hence, people are questioning what is happening to their land, especially when there is no written agreement between them and the investors. Local people gave up their land at a very low price from what they believe that the investors will attain all of their expectation including jobs creation, infrastructure and improving their living standards (WWF, 2008). They are then regretting their giving out of their land, while receiving no or little compensation. According to Cotula, (2009:70),“There are major concerns …about the weakness of provisions within national law for local people to steer development options and defend their own land rights”. Moreover, this problem seems to be very common in many of the poor countries and this have resulted in unequal sharing of the national cake as there is only few who are enjoying, while the majority is remaining vulnerable in all aspect of life. Cotula, (2009:72) pointed out five areas that explain how policies in poor countries fail to create awareness to the local communities in matter concerning them:

1. Communities do not receive relevant information in advance of consultation meetings.
2. Consultation meetings are generally attended by the community leaders (traditional chiefs, local party leaders), whose opinions are usually dominant. Preliminary meetings are held with the traditional leaders to ensure that the consultation meetings will produce an outcome favourable to the investor.

3. Despite being the majority of the workforce in rural lands, women are rarely involved in the consultation processes and they almost never sign the respective reports.

4. Most consultation records present incomplete or even conflicting data. While, on one hand, they may describe cultivated agricultural fields and other forms of evidence of human occupation, on the other hand they include a declaration stating that the land is not occupied for the purpose of the request at stake.

5. Consultation records often do not accurately reflect community opinions and viewpoints.

Currently the country have received about 20 companies from UK, Germany, Sweden, Denmark, Netherland and America and few from Brazil and Indonesia, which want to produce energy crops (Sulle & Nelson, 2009b; Wasley, 2010). These companies include Diligent Tanzania Ltd-a Dutch company, which is locate in Arusha region and already have taken over 3500 ha for jatropha production, SEKAB Bioenergy Tanzania Ltd- a Swedish company expecting to acquire 22 000 ha in Bagamoyo district and 100 000 ha in Rufiji for large scale sugarcane production, and Sun Biofuels Tanzania Ltd-an UK company has acquired 8 211 ha in Kisarawe district for jatropha production (Sulle & Nelson, 2009a).


<table>
<thead>
<tr>
<th>Investor</th>
<th>Area (ha)</th>
<th>Feedstock</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEKAB Sweden</td>
<td>400 000</td>
<td>Sugar cane</td>
<td>Wami River Basin, Rufiji, Kilwa and Bagamoyo</td>
</tr>
<tr>
<td>Bioshape</td>
<td>34 000</td>
<td>Jatropha</td>
<td>Kilwa district</td>
</tr>
<tr>
<td>PROKON UK</td>
<td>10 000</td>
<td>Jatropha</td>
<td>Mpanda district</td>
</tr>
<tr>
<td>ABERC</td>
<td>20 000</td>
<td>Croton megalocarpus</td>
<td>Biharamulo district, Kagera</td>
</tr>
<tr>
<td>Deligent Energy System Dutch</td>
<td>-</td>
<td>Jatropha</td>
<td>Several production and collection point in central/ North-east region (Handeni, Singida and Pandani)</td>
</tr>
<tr>
<td>Sun Biofuels UK</td>
<td>18 000</td>
<td>Jatropha</td>
<td>Lindi district</td>
</tr>
<tr>
<td>---</td>
<td>8 211</td>
<td>Jatropha</td>
<td>Kisarawe district</td>
</tr>
<tr>
<td>Inf. Energy</td>
<td>7 500</td>
<td>Palm oil</td>
<td>Kilombero district</td>
</tr>
<tr>
<td>------------------</td>
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<td>----------</td>
<td>--------------------</td>
</tr>
<tr>
<td>ABF Tanzania Ltd</td>
<td>60 000</td>
<td>Cotton tree</td>
<td>Kagera Region</td>
</tr>
<tr>
<td>TATEDO</td>
<td>-</td>
<td>Jatropha</td>
<td>Rural electrification with liquid biofuels in Arusha region.</td>
</tr>
</tbody>
</table>

3.2. **The Kisarawe biofuels project**

Sun-biofuel Tanzania Ltd a UK company have secured land for jatropha farming in Kisarawe district, coast region. Due to the fact that Kisarawe has good soil nutrients, good rainfall- and good transport and is situated close to the port. The company applied for 20,000 ha of land in Kisarawe, but has only managed to acquire 8 211 ha. The land, which was received, belongs to 11 villages including: Muhaga, Matamba, Marumbo, Palaka, Kidugalo, Kurui, Mtakayo, Vilabwa, Mitengwe, Mzenga A and Chakaye (Kamanga, 2008). From the information provided by the company, this land was not in use, although it was supporting 250,000 households by providing products such as charcoal, firewood, medicine, fresh water, fruits and poles (Kamanga, 2008). However, these households were entitled to compensation depending on the planted trees. According to Kamanga (2008:52);” The maximum amount paid in Tanzanian shilling is 250,000 (roughly US $ 250) for giving up livelihood supporting land”. The Tanzania government encourages this investment with the expectation that it will improve the local economy and provide villagers with a new cash crop, which allows them to diversify their portfolio (Biopact, 2007). The investment is expected directly or indirectly to employ about 1 000 local people for a start, a figure that could rise as the project expands (Biopact, 2007).
Figure 1: Potential from jatropha (Sources: Sawe, 2007).
Figure 2: Jatropha Production Chain (Adapted from: Janske and Romijn 2007).
3.2.1. The study area

Kisarawe district is located 70 km (43 miles) north-west of Dar es Salaam at 300 meters elevation. The district covers the land size of 3,535 km² and 23.5 km² occupied by forest. According to the 2002 Tanzania National Census, the population of the Kisarawe District was 95,614. In the study area there were 4,588 inhabitants and a total of 1,237 household. The villages can be accessed by dirt road, which is a seasonal one. There is only one bus which operates from Kisarawe town to the villages while many people prefer to use motor bicycle. The road is not considered safe because it goes through the forest “Ruvu South Forest Reserve”. It takes about one and a half hour to cross the forest and people are afraid of being robbed or attacked by wild animals (elephants etc). However, people who depend on charcoal to generate their income usually use bicycles to transport their product to the market in Dar es Salaam, which takes them about 20 hours one way.

Plate 2: Kisarawe road during the rainy season (Source: Baerendtsen, 2009).
Figure 3: Map of the United Republic of Tanzania, showing Pwani region as pointed by arrow. (Source: URT, 2002)
3.2.2. Economic activities

Most of the houses in Kisarawe are constructed from poles and mud and coconut grass used as roofing material. Many of these houses are small and crowded with (5 - 7 people living in one house of two rooms). Economically they depend on agriculture, small fishing and the production of charcoal. Both crops and forest products are mainly used for domestic consumption and as a source of income, where their markets relay on Dar es Salaam city. The district per capita income is 150 US dollar, which makes the district one of the poorest in the country (Mujinja, 2004). According to the information provided by the respondents, community livelihood depends on small-scale agriculture with most households cultivating an
average land size of 0.5 to 1 ha. Some of the villagers in this community have been food insecure for the period of more than 6 months in every year during the past five years, while some experience the problem at least for some weeks in the same past period. This problem is influenced by poor production methods, mainly depending on hand-hoe. In this community it has been very common to cultivate without using any additional inputs like fertilizer, pesticide or improved seeds, so they normally end up with small harvest and sometimes, especially during the dry season, they harvest nothing.

It is normal to see cashew tree in every house and most villagers have them in their field because cashew nuts is the major cash crop in the district. The district has been leading in cashew nut production for many years, but during the past eight years (2001 to 2009) production has declined from 600 tonnes to 39 tonnes (Daily News, 2010). The main reason is lack of a reliable market. Therefore farmers have decided to ignore cashew nuts and put more effort on other crops such as cassava (Daily News, 2010).

The community production relies on rain-fed agriculture, which is normally divided into two seasons (March to May and September to the end of October). On the other hand Kisarawe villagers, mostly men, work hard on making charcoal as an alternative source of income but this job seems to be not so easy because it take them more than twenty hours by bicycle to reach the market. They normally carry about 3 to 4 bags of charcoal (almost 200kg) on one bike, which makes it hard to ride. Instead they push their bike all the way to the market. According to the information provided by the respondents, most of their activities (including charcoal, poles, coconut, water sources and traditional medicine) were depending on the land, which now has been acquired by the company. This land was used by the villagers until 1974, when Mwl. Julius Nyerere, the first president of Tanzania, changed the villages into a socialist “ujamaa village”, where all villagers had to settle in one area in order to be easily served (school, health, extension, local government) as the means to reduce poverty, disease and ignorance. At that time, people left their land and relocate to where they live today. However, after relocating to their new place, they still use to go and work in their former land since their food trees, streams and graves are left there. Additional to that, most of traditional ceremony i.e. circumcision, taboo and burials were still carried out on land.
3.2.3. Food Status

In the study area, all respondents claimed to have suffered/ experienced food insecurity at least in one season of the year from past five years. These villagers normally eat one meal per day and they always eat corn with cassava leaves and beans. So they do not get a balanced diet including meat, milk and others in order to balance fat, protein and vitamins. During the focus group, I spoke with the district agricultural officer to know if they have any plan to assist those people. According to him, in Mzenga ward which has four villages (including Kidugalo, Kurui and Vilabwa) and a total population of 3,727 (817 households), about 1,924 people were food insecure in the end of 2009. He said that, there was a need of external supply of about 100 tonnes of starch and about 50 tonnes of beans to feed these people, but until the time we were speaking (March 2010) they had not yet received any support from government.

3.2.4. Land acquisition

Sun Biofuels, as one of the contemporary investors in Tanzania, followed all the legal requirements before obtaining the 8211 ha in Kisarawe district and the company has so far paid USD 280,000 (406 million Tanzania shillings) to compensate the affected 11 villages (2,840 households) (Biopact, 2007). According to the information provided by the company
general manager, Sun Biofuels did all the necessary procedures to acquire the land, “in 2005 we went to Tanzania Investment Centre (TIC) and District offices and later we had several meetings with the village leaders, therefore we ended up with 8211 ha after the villager’s satisfaction in giving out their land”. The company registered by the Tanzania Investment Centre with the firm certificate of incentives number 010176 after a Full Environmental Impact Assessment had been carried by the University college of Land and architectural studies (UCLAS) (Biopact, 2007). According to the company general manager, they picked Kisarawe because of the good climate i.e. rainfall, good soil nutrients and because it is located near to the port.

The information provided by the village leaders concerning land acquisition process was a bit opposite to those from the company. They say that, head of the district, parliament representative and the investor went to see all the affected village leaders. During these meetings they were only informed about the new investor, who wanted to cultivate jatropha and that he need the community to give some land and that those who will provide land to the investor will be compensated. Furthermore, the investor agreed to provide all the needs of the local community in order to improve their living. However, village leaders were not informed on how much land was requested or the extent of compensation and for how long their land would be taken. After the meeting all the village leaders were asked to go and inform their villagers about the news although they were not sure of what is going on. According to them there was no transparency in the whole process as they didn’t even sign a contract with the investor. Everything was done by the top leader and what they did was to inform them about the decision. Additional to that they claimed that, the investor promised to employ 4,000 people from the affected villages in the beginning of the project but only 44 people from two studied villages were employed, while in two remaining villages (Vilabwa and Kurui) none were employed. Other promises was also including wells construction, roads, hospital, schools and extension services and continuing with their activities in a possessed land i.e. charcoal, firewood, medicine, building materials, poachers and traditional ceremony such as circumcisions and burying of people.

Most of the acquired land in Kisarawe Districts was characterized as Miombo woodland (a species-rich tropical savannah ecosystem dominated by plant and animal species. This Miombo woodland provides food and cover for mammals such as the sable antelope and Lichtenstein’s hartebeest), with some patches of coastal forest and thicket. The obtained land was not habited, but was generally used to support livelihood of about 250 000 households including commercial charcoal production, as a source of water and for harvesting forest products such as traditional medicines, mushrooms, fuel wood and building materials (Sulle & Nelson, 2009). The community members who gave up their land for biofuels production were entitled to compensation. The compensation procedure basically depends on the planted trees and not on the market value of the land per se (Kamanga, 2008). However, 66% of the poor villagers who gave up their land have not been compensated up to now, while 16% have been half paid. According to Kamanga (2008:52), “a total of 2 840 households were entitled to compensation. However, our enquiries at the Sun Biofuel offices revealed that only 250 households were actually compensated”.
Plate 4: Miombo woodland- Tanzania (Source: Viljoen, 2009)

Table 2: Land size acquired from the specific villages (Source: District office)

<table>
<thead>
<tr>
<th>Village Name</th>
<th>Village land size (ha)</th>
<th>Acquired land (ha)</th>
<th>Acquired land (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vilabwa</td>
<td>3 039</td>
<td>300 ha</td>
<td>10%</td>
</tr>
<tr>
<td>Kidugalo</td>
<td>12 249</td>
<td>3 000 ha approx.</td>
<td>24%</td>
</tr>
<tr>
<td>Palaka</td>
<td>14 748</td>
<td>2 700 ha approx.</td>
<td>18%</td>
</tr>
<tr>
<td>Kurui</td>
<td>4 621</td>
<td>500 ha approx.</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34 657</strong></td>
<td><strong>6 500 ha</strong></td>
<td><strong>19%</strong></td>
</tr>
</tbody>
</table>

In Table 2 total land size possessed by the company for jatropha investment within the studded community is shown. The land acquired by the company is not well known by the village. According to them, the investor went to their villages when all the agreement had
been done by the top government including signed agreement. So it was hard for them to know how much land was taken from a specific village. I made a call with the district director to know whether the village leaders can provide a figure of their acquired land but he confirmed the information to be in the district offices. This is why land areas acquired in the above three villages are approximate and not clearly known. Furthermore, after the district office provides information for the total land size of the specific village in order to know the percentage of the acquired land within the studied villages. Land acquired (%) were highly observed in Kidugalo and Palaka (24% and 18%). The company possessed large land from these two villages compared to the acquired land in Kurui and Vilabwa.

3.2.5. Promises

According to the information provided by the respondents (including individual respondents, village leaders and focus groups discussion), there were many promises given by the investor including job opportunities, road improvement, providing of agricultural inputs, paying compensation to those who gave their land, access to safe and clean water, improving school and hospital, building the village office and to help elderly people. The investor influenced local community with many promises and that was the reason why they accepted to give up their land for the sake of having better life. The company promised to employ 1 000 villagers in the beginning and 1 500 as the project grows, but according to the company manager, only 400 people are currently employed by the company of which only few of them belong to the affected villages. About other promises he says that, they are still working on it and they only need time to know where they can construct wells and so on.

However, according to the information provided by the respondents, Sun Biofuels promised them that they can continue doing their work in the acquired land like fetching water and burying people as they were doing before. Despite this, many villagers complain that the company has stopped them from passing or entering the company farm. One village leader showed me a letter from Sun Biofuel with the following content: "In order to maintain good relationship with us by this letter, we are giving you a three weeks' notice effective from February 23, 2010 and when it reaches March 15, 2010, the company will be compelled to use force to arrest and evict anyone, who will come across the area of its jurisdiction".
4. Analysis and Results

Data was analyzed to provide all the necessary information to meet the research objectives. It includes the extent of success of the investment procedure resolving how local people were compensated, involved, level of acceptance and level of food insecurity. The data provide information for an understanding of peoples’ perception and their willingness to integrate jatropha crops with their food crops.

4.1. Willingness to Participate and Awareness

This part is showing people’s awareness and their participation in the whole process of giving out their land. In this case some were recorded as not involved or not to being aware of the project investment. Initially only 15% of the respondents were willing to participate, while after the discussion and promises 35% were positive. This happened because of the poor participatory approach used by the investors and government representative when they introduced the company. Local people were not well informed and most of the decision was taken by the government. Village leaders complaining of not being aware of all the investment process, claim that even the investor, Member of Parliament and district leader
went to them when they had made up their mind to allow the investor to acquire land from their community. Village leaders were supposed to inform their people about the news and to prepare them for the general meeting, which was held by the company, member of the parliament and district leaders and that is where villagers were promised to be compensated and all other promises including having safe and clean water.

Figure 5: Percentage of the people who were willing to participate and those who not agree to be involved or aware of the investment procedure within the studied community.

The chart above represents overall level of participation within four villages. Those who initially accepted to be involved in the land acquisition process were 15%. These respondents were involved by attending the village meetings during the investment process and they were willing to give their land to the investor. However, an additional 35% of the respondents later accepted to be involved by being influenced by others and due to the number of promises that were given by the investor, such as employment, improved life, etc. On the other hand 39% of the respondents claim not to have been involved in the whole process; this is because they were not around when the investor came to their villages and/or due to other family responsibilities, i.e. maternity and sickness. They claim not to have accepted the deal but still the company took some of their land. The remaining 11% are those who were not aware of what was happening to their land although some attended the meeting without understanding because of being old and having low level of education. One of the respondents said: “they
didn’t tell us what is going on. Instead they asked us to stand in front of our land while they took some pictures”.

Table 3: The table showing how people were willing to participate and those who were not involved and not aware of the investment process among the four studied villages.

<table>
<thead>
<tr>
<th>Village name</th>
<th>No. of Households</th>
<th>High</th>
<th>Low</th>
<th>Not involved</th>
<th>Not aware</th>
<th>(%) Not involved &amp; aware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vilabwa</td>
<td>25</td>
<td>1</td>
<td>7</td>
<td>14</td>
<td>3</td>
<td>68%</td>
</tr>
<tr>
<td>Kidugalo</td>
<td>26</td>
<td>6</td>
<td>14</td>
<td>6</td>
<td>0</td>
<td>23%</td>
</tr>
<tr>
<td>Palaka</td>
<td>27</td>
<td>2</td>
<td>7</td>
<td>14</td>
<td>4</td>
<td>69%</td>
</tr>
<tr>
<td>Kurui</td>
<td>27</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>4</td>
<td>41%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>105</strong></td>
<td><strong>16</strong></td>
<td><strong>37</strong></td>
<td><strong>41</strong></td>
<td><strong>11</strong></td>
<td><strong>15%</strong></td>
</tr>
<tr>
<td><strong>T. Hh ×100</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>35%</strong></td>
</tr>
</tbody>
</table>

Below the general picture, there are marked differences among the villages. In all four villages there were few people (15%) who were strongly in favour of being involved in all process of land acquisition and who were willing to give up their land to the investor. The third column represents those who accepted to be involved but only after being influenced by other villagers and after some promises from the investor, i.e. having better life. In Kidugalo village, more than half of the respondents (twice the numbers in Vilabwa and Palaka) accepted the company because of promises. The fifth column shows those villagers who were not involved in land acquisition due to some reasons including travelling and family responsibilities. This was especially observed in Vilabwa and Palaka where more than half of the respondents in each village claimed not to be involved in the process. At the same time, a few respondents say they were not aware of what was going on although the company took some of their land. In Vilabwa and Palaka 68% and 69% of the total responding households respectively were not involved or aware, while in Kidugalo there were only 6 respondents of such kind.

4.2. **Integrating biofuel crops with smallholders agriculture**

Integrating jatropha with smallholder’s farmer is taken to be a possible solution that would protect local communities from being food insecure. Local communities can easily intercrop jatropha with their food crops, a crop like beans can be combined with jatropha supplying the beans with shadow tree.
Table 4 shows the number of households within the four villages that were willing to integrate jatropha crops in their fields and those who didn’t seem to accept the idea. Most of the respondent in Vilabwa village (17 households) didn’t like the idea of combining jatropha within their field, while in the Kurui village the story was different: - 19 out of 27 households responded to be accepting and willing to integrate jatropha in their fields. However, in the Kidugalo and Palaka villages half of the respondent was willing to combine jatropha and the remaining half was not ready to do so. Generally the whole result from four villages is 53 out of 105 households accepted the idea of integrating jatropha in their fields for the reason that jatropha can be alternative source of income.

Table 4: Number of people who accept and not accept to integrate jatropha plant in their small-holder agriculture.

<table>
<thead>
<tr>
<th>Villages</th>
<th>No. of H/h</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vilabwa</td>
<td>25</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Kidugalo</td>
<td>26</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Palaka</td>
<td>27</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Kurui</td>
<td>27</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>105</td>
<td>53</td>
<td>52</td>
</tr>
<tr>
<td>%</td>
<td>100%</td>
<td>51%</td>
<td>49%</td>
</tr>
</tbody>
</table>

On the other hand the remaining 52 households were unwilling to integrate jatropha simply because they know nothing about this crop. They were afraid of negative impact e.g. diseases and insects. Therefore, in general the results show that more than half of the respondents in two of the villages (Vilabwa and Kidugalo) were negative, since they were not ready to integrate jatropha in their farming for reasons explained above. The remaining two villages (Palaka and Kurui) were positive to integrate jatropha in their field. However, when it came to compensation these villages were the least compensated (especially Kurui where no one have yet been compensated or get employed). In this case I think these villagers were trying to be polite and show their willingness to integrate jatropha in order motivate the investor to pay their compensation and also to have more chance when it comes to job opportunities as they feel they are benefitting less than the other two villages.
4.3. Acceptance of jatropha

This part is presenting the degree of acceptance of the project within the study area specifically after being aware of the introduced energy crop. Some respondents recorded to accept the project while others were not ready to accept the project therefore they were asked to provide their reasons on rejection. Moreover, 44% of the respondents accepted to cultivate jatropha in their field, since they believed jatropha is the new crops that would supplement their incomes especially after the fall of cashew nuts in the market, which was the main cash crop for income generation. However, some of them only accepted jatropha when the company would provide them with extension services, satisfied market price and give them all agricultural inputs i.e. fertilizer, insecticides, high yield varieties, instructions how to cultivate and how to avoid negative impacts etc. Furthermore, some of respondents they accepted to cultivate jatropha but without integrating it with their food crops. Instead they would divide their field to make room for jatropha production. A remaining 27% did not accept the jatropha plant on their fields. Most of these argued that, they did not have any knowledge on how to grown jatropha and at what extent it would affect their food crops i.e. “Cassava”. One respondent says that “I’m afraid to combine jatropha crops with my food crops, I don’t know what will happen when the roots of two crops come across they might destroy my cassava”. So, most of them were afraid to accepting jatropha due to not knowing enough about this crop.

![Level of acceptance.](image)

Figure 6: General percentage of the people accepted and not accepted to cultivate jatropha plant within the studied community.
Whereas figure 6 above displays the overall levels of acceptance within the study area, not all villages were equally keen on accepting the proposed scheme. Especially in Kurui village the majority were in favour but not straight forward. Instead they need company to provide them with extension services, high yield variety and other agricultural inputs. This was (also) observed in Kurui village, where 11 respondents (out of 27) demanded such support before accepting the crop, while in Vilabwa only 4 such households were recorded. Moreover, 27% of the respondents did not accept the project, simply because they do not have enough knowledge about the new crop and/or claim to have no surplus land to enable cultivation/production. This was highly observed in Vilabwa and Kidugalo where 10 respectively 40% of respondents rejected the crop, while in Kurui there were only 2 such respondents.

Figure 7: Number of people who accept and not accept to take the new crops “jatropha” among individual studied villages.

4.4 People’s Expectation

Although the interview was carried out when the project was already implemented they still gave important information on the expectation by people. During the interviews some of the respondent admitted that they were expecting to have safe water, employment, while others wanted, to get improved hospital, school and agricultural support, which were among the
promises made by the company. Government leaders were also involved in convincing local people to give their land for the reason that they will be compensated by the company.

Employment is the priority number one in three of the villages (Vilabwa, Kidugalo and Palaka), while in Kurui village wells is the most urgent issue. However, wells were the second priority also among the three villages which is sign on the widespread of poverty. However, Palaka and Kurui were recorded for many respondents who did not have any expectation, which in turn possibly was influenced by the fact that the project had already started therefore there were no place for expectation.

Table 5: People’s Expectations based on genders views among individual villages.

<table>
<thead>
<tr>
<th>Village name</th>
<th>No.of H/h</th>
<th>Employment</th>
<th>Wells</th>
<th>School. + Hosp.</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Vilabwa</td>
<td>25</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Kidugalo</td>
<td>26</td>
<td>8</td>
<td>5</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Palaka</td>
<td>27</td>
<td>10</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Kurui</td>
<td>27</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>105</td>
<td>31</td>
<td>10</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>29%</td>
<td>10%</td>
<td>5%</td>
<td>15%</td>
</tr>
</tbody>
</table>

Table 5 above clearly demonstrates people’s expectations on gender basis from the beginning and continuation of the project. To achieve employment, safe and clean water, improved school and hospital were the majority expectations from the project although there were a few who prefer to receive agricultural extension services and those who do not have any expectation. Most of the responded males in Vilabwa, Kidugalo and Palaka were highly expecting to get job followed by no expectation 24%. While Kurui village did not show to have any expectation instead they were disappointed. Clean and safe water were highly expected by the female 15% compared to the men (5%), this is because woman are the responsible in doing home activities. Women are forced to work in a long distance fetching water this is the reason why their highly expecting wells instead. Not only that but also they were hoping to get job and improved health services although 10% are totally disappointed and they expect nothing than being compensation. According to their responses, they claim
they were not compensated by the company, that is why they are completely hopeless and they only ask for their money, nothing more. One of my respondents claimed that: “We are oppressed in our own land; we were forced to give up land without knowing the truth about this, the man paused and continued, “the investor is threatening like hunger”.

4.5 Compensation

People gave up their land because they were promised compensation, which would come as direct (cash) and indirect/collective (public goods). The latter have not yet materialized. When it comes to direct/individual compensation, according to the information pro-vided by the interviewees, the company compensated them by giving 18,000 T.sh (12 US dollars) per tree. This part is exemplified by how respondents claim to have been compensated by Sun Biofuel or not. However, some of them regards they were compensated partially.

Figure 8: Overall level of compensation for both who were paid and not paid in both four villages.

Figure 8 represent the overall level of compensation in percentage among four villages; showing the gap between those who were compensated and those were not. A majority of the households (66%) did not yet received their portion and 16% had been partially compensated
waiting for their remaining part, while only 18% of the respondents were full paid. Differences between the villages are great, however.

Figure 9: Level of compensation for both who were paid and not paid in the specific studied villages.

Figure 9 presents diverging level of compensation in the different villages. In Kidugalo village most of the respondents were recorded as fully compensated and a few were half compensated “partially paid”. In Kurui the story was totally different: no household had been compensated yet. Partly, this effect may be explained by the basis for the compensation procedure, which is based on the number of food trees, i.e. “planted trees” like mango, coconut, orange and other food trees and not on the land size. In Kurui most of the household do not grow these trees on their land, why they received nothing although their land was taken. Another complication is that the acquired land actually was not their property, but they use to have access to it.

4.6 Food Insecurity

Most of the interviewed households were recorded to be food insecure. This is due to the inefficient agricultural methods, which characterizes small-scale farmers, who only cultivate 1-3 ha. The interviewees responded to be vulnerable to food insecurity for more than 6 months in each year during past four to five years. However there is no respondent who blame
the company to be the cause of this problem, because they were food insecure even before the company arrived and still the investor does not have any out grower’s scheme within the community.

Figure 10: General levels of food insecurity within the study area where by, majority were most affected than the others.

Level of food insecurity within the four villages proved to be bad (Figure 10, Table 7). Table 7 shows that chronic hunger was mostly recorded in many household, where by half of the total respondent (53%) experience food shortage. Most of them were recorded to be food insecure at least in 6 months in every year for the past five years, while another group (33%) had experienced food insecure for 2-5 months during the same past period. In total 86% of the whole households in the study area has been experiencing food insecurity during the past five years. Most of these respondents can manage to eat only one meal per day and likely sleep with an empty stomach. Extreme change of weather condition (long drought season) wild animals and lack of technological agricultural inputs (i.e. tractor, high yield varieties, etc) were given as reasons for the food insecurity. The remaining households (14%) were recorded to be food insecure for a short period of less than a month or few days. Generally, no big differences occurred among the villages, although Palaka and Kurui seemed most affected in this respect.
Table 6: Level of food insecurity within the specific villages where by, both villages were recorded to be more vulnerable and only few were less affected.

<table>
<thead>
<tr>
<th>Village name</th>
<th>T. No: of H/h</th>
<th>High (above 6 Months)</th>
<th>Medium (2-5Months)</th>
<th>Low (1-less than Month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vilabwa</td>
<td>25</td>
<td>11</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Kidugalo</td>
<td>26</td>
<td>11</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Palaka</td>
<td>27</td>
<td>16</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Kurui</td>
<td>27</td>
<td>17</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>105</strong></td>
<td><strong>55</strong></td>
<td><strong>35</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td><strong>%</strong></td>
<td><strong>53%</strong></td>
<td><strong>33%</strong></td>
<td><strong>14%</strong></td>
<td></td>
</tr>
</tbody>
</table>

5. Discussion

This thesis set out to assess the perceptions and realities of biofuel investment of rural livelihoods of Tanzania. It shows that there are many issues, which were not clear during the introduction of the exploring companies within the studied area. Farmers/rural people are mostly skeptical when an external actor (NGOs, donor, company or government) comes to the village and want to launch a project. They have difficulties to understand how the project will affect them or what they are going to benefit. This makes them feel like they have been cheated by the investors, especially when no benefit is directed to them. Thus, when the Sun-Biofuels company went to the village for the first time, people in the village, including village leaders, were desperate to accept the conditions for the sake of having a better life, why they accepted without thinking of how the process of giving out their land to the company would affect them both in the short and long term. Later, when they figured out and understood what was company’s plans, they felt ripped off.

In the studied area the villagers themselves were the less involved although they were the ones who were to give up their land. Comparing four villages, half of the respondent in the two villages Vilabwa and Palaka were recorded as being not involved for different reason, e.g. some were not around during the meeting, others claimed to be sick and in maternity, while others were not informed about the meeting. Analysis shows that 52 out of 105 (50%)
interviewed household claim to be not involved and were not aware of the introduced project. The low level of participation in Vilabwa has driven the villages to reject the project (Table 4). This is probably one of the reasons why 56% of the responding households were found not to be interested in the introduced crop. On the other hand 36 out of 53 households in the Kidugalo and Kurui villages agreed to be involved.

Introducing this kind of investment has made villagers put all their expectation for their future development into the company for what they believe that the investor has the power to do. Employment was the main hope of the villager’s majority (39%), since having a job is the most influential factor for the level of poverty affecting the community. A job with a salary was regarded as the only thing that could reduce their problems, since they would use their salary to buy food and other family need. The second expectation was to have easier access to clean and safe water, because villagers are forced to walk long distances to fetch water in open wells. In this matter women are the most affected group, because women are responsible for taking care of all the house work. Therefore, all of the interviewed women prioritized clean and safe water followed by other expectation. Other expectation was to have improved school and hospital and extension services. However, 34% of the respondents in all villages and especially in Kurui and Palaka villages were no longer expecting anything from the company for the reason of not yet being compensated. During the interview most of them were so disappointed on the investor and government although there were trees in their possessed land. According to them, the investor promised to compensate those who gave up their land, but that did not occur and others lost their land without even been informed. However, the information provided by the company is that they need some time to survey the village to know where exactly to construct wells, school and hospital while other promises too will be provided. The company general manager also added that this company is just started and still needs some time to plan for that and will provide all the promises in due time.

The process and procedure used to compensate people also seems not clear as a majority (66%) of the total responded households were not compensated. The compensation criteria used by the investor and government can be one of the reasons why half of the respondent were not compensated, although most of them were qualified for compensation (having planted trees i.e. mango, coconut, cashew nut etc). The compensation was meant to give jobs and/or money directly to individual households and indirectly (collective) by providing the community with clean water, hospital, etc. Sun-biofuel promised to employ 1000 people in the beginning and later on 1500 people from the affected villages. This made majority of the villagers to accept the company, but up to the research time the company have manage to employ only 44 villagers (out of 400 employee involved). The 44 belong to the two villages, while the remaining two villages have not yet received such opportunity. Thus only a fraction of the employees come from affected villages and one of the respondents complained: “the company gives job to the people from Dar es Salaam and left us who give our land to them”.

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Food insecurity within the study area has been a problem among many families. There are many reasons contributing to the problem, for example, Longer drought season wild animals i.e. pigs and monkeys, poor agricultural methods, lack of agricultural inputs i.e. fertilizers, pesticides, lack of knowledge and poor market for cashew nuts. Information given by the district agricultural officer reveals that people are in need for support. So far, the company’s arrival has not changed this situation.

Land transfers must be approved by the communities or customary leaders that have rights over the land in question, with further requirements for protection of access rights, fair compensation, and opportunities for review of the agreements. In the investigated case, the whole process of land acquisition and investment procedure was not clear and understandable to the affected community. The company and government took advantage of villagers’ ignorance to take what they have. Although not formal owners, the land acquired was useful to the locals. They use it as alternative or supplementary source of income although it is not allowed to do any form of deforestation.

The study also noted sometimes great differences between villages when it comes to acceptance of jatropha, willingness to participate in the proposed project, degrees of participation and levels of compensation. It has, however, not been possible to draw any firm conclusions about these inter-village differences. The table below demonstrates general findings from the studied villages.

Table 7: General findings which express the reality on the investment procedure and community livelihood as issue of participation, compensation, acceptance, expectation and the level of food insecurity are clearly shown (Source: field data, 2010)

<table>
<thead>
<tr>
<th>Village</th>
<th>Involved</th>
<th>Acceptance</th>
<th>Integration</th>
<th>Compensation</th>
<th>Expectation</th>
<th>Food Insecure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>agreed</td>
<td>not</td>
<td>yes</td>
<td>no</td>
<td>agreed</td>
<td>not</td>
</tr>
<tr>
<td>Vilabwa</td>
<td>32</td>
<td>68</td>
<td>69</td>
<td>40</td>
<td>32</td>
<td>68</td>
</tr>
<tr>
<td>Kidugalo</td>
<td>77</td>
<td>23</td>
<td>62</td>
<td>38</td>
<td>42</td>
<td>58</td>
</tr>
<tr>
<td>Palaka</td>
<td>31</td>
<td>67</td>
<td>74</td>
<td>26</td>
<td>56</td>
<td>44</td>
</tr>
<tr>
<td>Kurui</td>
<td>59</td>
<td>41</td>
<td>93</td>
<td>7</td>
<td>70</td>
<td>30</td>
</tr>
</tbody>
</table>

42
Clearly, general findings have proved that, every village has different perspective from the other in term of their views concerning the whole investment issues. This mostly shown on the bolded colour since is the main crucial part that fits with the previous discussion and research objectives. Vilabwa and Kidugalo shares similar thought on the level of acceptance and integration of jatropha, since both were not agreed to all mentioned categories. However, in Kidugalo village 73% agreed of being compensated while in Vilabwa 68% of the respondent were not involved in the process. The remaining two villages (Palaka and Kurui) also share the same view, as the majority were not compensated at all (78 and 100%), therefore, they no longer have any expectation. However, on the other hand these villages are highly accepted the company (Palaka 74% and Kurui 93) and agreed to integrate jatropha crops in their field (Palaka 56% Kurui 70%). All four villages appeared to be sharing the similar thought; all were vulnerable to food insecurity from 84% to 89%. Majority of Vilabwa and Palaka recorded of not been involved in the whole investment process.

6. Conclusion

The findings confirm Cotula´s (2009) statement that African government should change their approach into a bottom-up approach that would give opportunities to poor communities to express their thoughts about the issue concerned. Transparency is the major tool that can reduce grievances from local communities, especially when it comes to the large-scale land acquisition. Doing so will contribute to long-term land sustainability.

Tanzania government should have a policy that would make sure that, before any land have been allocated to the investor, local communities must be aware of what is happening to their land. The government must establish institutions that would coordinate public engagement on biofuels investment, in order to understand people´s opinions towards biofuels projects within their areas.

The government policy should also make sure that, any formal promise which is given by the investors are written down with signatures between investor and the targeted community. This would protect local community from been cheated. People should know the amount and time duration of the project as well as compensation before land acquisition, in order to allow poor people a fair basis for deciding whether to give out their land or not.
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Annex 1: RESEARCH QUESTIONNAIRE FOR THE FARMERS / LOCAL COMMUNITY

A). Personal information

1a. What is your name…….?  
b. How old are you…….?  
c. Gender  
   Male    female  
d. Level of education: Primary   Secondary   Diploma   University  
e. Marital status    married   divorced   widow   single  
f. How many people are living in this house?  

B)  
1. How do you sustain your daily needs/demands?  
2. How many hectares of land do you have?  
   - What proportion do you use for cultivation?  
   - What proportion is not cultivated? Why?  

2a. Which type of food crops do you cultivate in your land? Is it for domestic consumption or for sell?  
2b. Have you experienced food shortage before? If yes, for how long?  
2c. What was the reason for the problem? And how did you cope with it?  

3. Do you know Jatropha? A. Yes, how    B. No  
3a. How many hectares did you give to the company for jatropha production?  
3b. How were you involved for the jatropha land acquisition?  
3c. Would you like to produce jatropha in your farm? If No, why not?  
3d. Would you like to combine both jatropha and food crops in your field?
4. Which type of activity were you/people doing on the land you have given to the company?

4b. What kind of compensation did you get for giving out your land to the company?

5. Which opportunity do you think you miss after giving out your land? Do you think the land you have given out was important for your daily needs?

5a. Are there other opportunities for income generating activities?

6. How do you sustain your demand? Does the company help in creating any alternative livelihoods to the farmers?

6a. Is your family more or less food secure after the introduction of this project/jatropha production?

7. Is there any member of your family who is employed by the company and how do the person manage to produce food for the family? I mean how many hours are used to produce food in their own field/ farm?

8a. Is there any promises do people receive from the investors?

8b. What do you expect from the company? Pros and cons

Thank you for your cooperation

Annex 2: RESEARCH QUESTIONNAIRE FOR LOCAL GOVERNMENT, DISTRICT OFFICIALS AND COMPANY.

1. Name:

2. Age and gender:

3. Position:

4. How long have you working here?
5. How much land has the company acquired from this community?

6. How was land acquired (procedure) or how was land accessed for production?

7. For how many years will this company possess this land?

8. What happened to those who gave up their land?

9. What type of compensation did they receive?

10. How many villagers are employed/ working for the company? Is there any criteria were used to recruit them?

11. If yes, explain them

12. Why Jatropha?"

13. How do people perceive this crop “Jatropha”?

14. Are there any difficulties that the company experiences in introducing jatropha to this community?

15. How does the company organize its production? i.e. plantation, small scale, out growers, others.

16. Is Jatropha grown for export or domestic use?

17. Does the company have out growers?

18. If yes, what is the production arrangements/agreements with the Company?

19. Can jatropha be positively combined with food crops?

20. Does jatropha have any multiplier effects contributing to economic growth and diversification- locally, regionally, nationally?

21. Does the community benefit from this new crop?

22. If yes, how

23. What are the economic activities that were carried in the acquired land?

24. How do people sustain their livelihood after selling their land especially those whose incomes were depending on the possessed land?

25. Is there any support that people receive from the company to sustain their livelihood?
26. Does the company help in creating alternative livelihoods for those people?

27. What are the short and longer-term aspirations of the company with respect to this investment?

Thank you for your cooperation

Annex 3: RESEARCH QUESTIONNAIRE FOR THE FOCUS GROUP DISCUSSION.

(Knowledgeable people involved “2 Teachers, 2 livestock keeper, 1 Nurse, 2 Large Scale Famers, 2 Businessman”)

1. Who own the land in your community?

2. Which type of food crop is cultivated in your village?

3a. How many hectares do the company acquired from your village?

3b. Which procedure does the company was used to access land for the jatropha production?

3c. Who were the most affected by this project, in term of land?

3d. Was village / local government involved in land allocation to the company?” – If yes, “how?”

3e. Who decided on Jatropha (there are other bio-fuels)?” why jatropha

4a. Do you think the company took the land which was used to produce food? If Yes, how do people cope with the situation?

4b. What type of compensation and which criteria were used to compensate them?

5a. How many people are employed in the company? Which criteria were used to recruit them?

5b. Is there any problem of labour power at the household level after the implementation of this project? If yes how?

6a. What is the level of food security in this community?
6b. Is there any assistance from the company to support food security in this community? If yes, what are they?

7a. What are the people’s perception towards this new crop?

7b. How do jatropha be known in this community and the level of acceptance?

7c. What do they expect from this company? Is there any promises given by the company?

8. What are possible solution/suggestion to maintain people’s livelihood at the same time to benefit from this project “win win solution”

9. Pros and Cons of biofuels in this community.

Thank you for your cooperation