REPOA
P.O. Box 33223, Dar es Salaam, Tanzania
157 Mgombani Street, Regent Estate
Tel: +255 (0) 22 2700083 / 2772556
Fax: +255 (0) 22 2775738
Email: repoa@repoa.or.tz

Website: www.repoa.or.tz

ISBN: 978-9987-483-09-9

Socio-Economic Factors Limiting Smallholder Groundnut Production in Tabora Region

Mangasini A. Katundu, Mwanahawa L. Mhina,
Arbogast G. Mbeiyererwa and Neema P. Kumburu

Research Report
14/1

Socio-Economic Factors Limiting Smallholder Groundnut Production in Tabora Region

By Mangasini A. Katundu, Mwanahawa L. Mhina, Arbogast G. Mbeiyererwa and Neema P. Kumburu

Research Report 14/1

POLICY RESEARCH REPOA FOR DEVELOPMENT

Published for: REPOA
P.O. Box 33223, Dar es Salaam, Tanzania
157 Mgombani Street, Regent Estate
Tel: +255 (0) 22 2700083 / 2772556
Fax: +255 (0) 22 2775738
Email: repoa@repoa.or.tz
Website: www.repoa.or.tz

Design: FGD Tanzania Ltd

Suggested Citation:
By Mangasini A. Katundu; Mwanahawa L. Mhina; Arbogast G. Mbeiyererwa and Neema P. Kumburu
"Socio-Economic Factors Limiting Smallholder Groundnut Production in Tabora Region"

Research Report 14/1, Dar es Salaam, REPOA

Suggested Keywords:
Groundnut, socio-economic factors, gross margin, smallholder farmers, and poverty reduction.

ISBN: 978-9987-483-09-9

Table of Contents

List of Tables

List of Figures

Abstract

Groundnut is among the most important crops for smallholder farmers in Tanzania, providing both food and income for households. Groundnut is a nutritious source of fats, protein, carbohydrates, vitamins and minerals for human consumption and parts of the crop can be used for livestock feed. This study identified factors which contribute to the stagnation of groundnut production among smallholder producers in Urambo district of Tabora region in Tanzania. Quantitative data were collected using a survey questionnaire administered to 400 smallholder farmers. Multistage, simple random and purposive sampling were used to select participants. Qualitative data were also collected through focus group discussions, key informant interviews and personal observation. A multivariate regression technique was used to examine socio-economic factors influencing small-scale groundnut production in the district.

In addition, the profitability of various crops produced in the study area was assessed using gross margin analysis. Results indicate that hours spent farming, cultivated land size, the price of groundnut from the previous season, cost of seeds and cost of pesticides significantly influence groundnut production in the area. Data further indicate that groundnut was the third most profitable crop in the area after beans and rice. The study also revealed gender disparity in land ownership. Few women owned land despite being major providers of labour. Based on the evidence, the study recommends that the government, among other policy responses, expand extension services to ensure that smallholder groundnut farmers have access to high-yielding groundnut seed varieties, agro-chemicals, improved farm inputs, storage and marketing facilities.

Acknowledgements

We would like to register our appreciation to all of the individuals and organizations who assisted us to undertake this study. Many thanks to REPOA for funding this study, the support of their technical committee, and their tireless assistance in reading and correcting various versions of our proposal and draft report.

We are grateful to the Urambo District Council's Executive Director (DED) for permitting us to conduct this study in that district. We also wish to thank the Ward Executive Officers (WEOs) at Vumilia, Ussoke, Usisya, Songambele and Muungano for their warm welcome, and for introducing us to the Village Executive Officers (VEOs), and, by extension, to the villagers.

Our sincere gratitude is extended to the VEOs in Usisya, Ussoke, Katungulu, Usongelani, Kalemela A and B, Jioneemwenyewe, Songambele, Vumilia, Uhuru, Sipungu and Itegamatwi villages for providing us with secondary data and introducing us to smallholder farmers, the primary respondents of this study.

Last but not least, we would like to extend our appreciation to the farmers who completed the questionnaires for their co-operation and openness in sharing information. They are too many to mention individually, but we thank them all.

1 Introduction

1.1 Background Information

Groundnut (*Arachis hypogaea L.*), a species in the family *leguminasea,* is an annual legume. It is known by many local names, including peanut, earthnut, monkey-nut and goobers. The groundnut originated in Latin America and was introduced to African continent from Brazil by the Portuguese in the 16th century (Abalu & Etuk, 1986; Adinya *et al.,* 2010; Hamidu *et al.,* 2007). The crop is mainly grown for oilseed, food, and animal feed (Pande *et al.,* 2003; Upadhyaya *et al.,* 2006). It is the world's 13th most important food crop, 4th most important source of edible oil and 3rd most important source of vegetable protein (Taru *et al.,* 2010).

Groundnut seeds, known as kernels, contain 40-50% fats, 20-50% protein and 10-20 % carbohydrates (Sorrensen *et al.,* 2004). They are a nutritional source of vitamin E and other minerals for human health including niacin, falacin, calcium, phosphorus, magnesium, zinc, iron, riboflavin, thiamine and potassium. Groundnut is useful in the treatment of haemophilia, can cure stomatitis and prevent diarrhoea, and is beneficial for pregnant women, nursing mothers and growing children (Akobundu, 1998). The kernels can be eaten raw, roasted or boiled and the groundnut vines are used as fodder for cattle (Pompeu, 1980; Hong *et al.,* 1994). The crop can be used for producing industrial materials, such as oil-cakes and fertilizer. Extracted oil from the kernel is used as culinary oil and other crop extracts are used as animal feeds (Nigam & Lenné, 1996). Almost every part of the crop is used in some way. The multiple uses of the groundnut plant make it an important food and cash crop for domestic consumption and export in many developing and developed countries. Globally, 50% of total groundnut production is used for oil extraction, 37% for confectionery use and 12% for seed (Taru *et al.,* 2010).

Groundnut is grown in nearly 100 countries. Globally, it is grown on almost 23.95 million hectares with total production of 36.45 million tons and an average yield of 1,520 kg/acre in 2009 (FAOSTAT, 2011). China, India, Indonesia, Nigeria, Senegal, Sudan, USA and Myanmar are the major groundnut growing countries (Taru *et al.,* 2010; FAOSTAT, 2011). Developing countries in Asia, Africa and South America account for over 97% of world groundnut cultivation and 95% of total production. Production is concentrated in Asia with 50% of global cultivation and 64% of global production. In Africa, groundnut production accounts for 46% of global cultivation and 28% of global production. Between 2000 and 2009, the annual global production increased marginally by 0.4%, the area cultivated by 0.3% and yield by 0.1% (ICRISAT, 2012; Pound & Phiri, 2010). In 2011, Tanzania accounted for 2.9% of the global area for groundnut cultivation and produced 1.7% of global production. The most important growing regions in Tanzania include Mtwara, Tabora, Shinyanga, Kigoma, Dodoma and Mwanza.

While groundnut production is considered a profitable venture (Adinya *et al*., 2010; Taru *et al*., 2010; Taru *et al*., 2008), the total world production of groundnut with shells has not increased much. Global production increased from 35,880,941 tonnes in 2001 to 38,614,053 tonnes in 2011 (FAOSTAT, 2011). Groundnut in African countries, such as Tanzania, is grown at a small-scale level and with less application of modern inputs (Taru *et al*., 2010). For example, during the previous decade, groundnut production in Tanzania has not exceeded 8% of the world output (ITC, 2011).

According to FAOST (2011), groundnut production in Africa in 2011 was 9,435,493 tonnes with Tanzania producing 651,397 tonnes. Yields in Tanzania are also lower compared with other African countries. For example, in 2011, groundnut yield in shell was 964.7 kg/acre in Tanzania compared with 1,264.6 kg/acre in Nigeria and 1,724 kg/acre in Guinea-Bissau (FAOSTAT, 2011). Hitherto, the annual yield per hectare in Tanzania has not increased substantially. However, factors associated with low groundnut yields in Tanzania are neither known nor well documented.

Within Tanzania, Tabora Region was picked for this study because it is one of the major groundnut producing regions in the country. In addition, unlike other producing regions where groundnut is considered as a food crop, groundnut in Tabora is mainly regarded as a cash crop. It is the third most important cash crop to household income after tobacco and cotton. Other food crops produced in the region include maize, rice, sorghum, cassava and beans (URT, 1998).

1.2 Statement of the Research Problem

Available data and experience indicate that Tabora region is experiencing a sharp decline in the overall production of groundnut. Yields range between 500 and 600 kg/acre compared with a potential yield of 1,000 kg/acre. This declining trend was noted in 2008 data of the Food and Agricultural Organization. Urambo district, the major producer of the crop in the region, is highly affected. Like many other districts, Urambo is dominated by smallholder farmers whose livelihoods are largely dependent on income from the production of various crops. For example, the principal sources of rural income in the district are tobacco, maize and groundnut. But, as cited above, groundnut farmers are experiencing a sharp decline in yield.

The traditionally-grown *Mamboleo* variety of groundnut, which was introduced in the 1960s, has a lower yield compared with improved varieties. As a result, farmers have been forced to abandon it (Bucheyeki *et al*., 2008; Bucheyeki *et al*., 2010). Bucheyeki *et al.* (2010) conducted a study to address this problem. Two varieties, *Pendo* and *Johari*, were identified by respondents as high-yielding and possessed preferred traits. Famers identified 10 traits for evaluation of groundnut varieties. These traits were good taste, short cooking time, large seed size, early maturity, high market demand, high yielding, insect-pest resistance, high oil content good peanut butter and disease resistance. Overall farmers' evaluation ranked Pendo and Johari as first and second respectively.These varieties were recommended to farmers in the region so as to improve yield. However, no studies have focused on the socio-economic factors that might be contributing to low yields. Efforts to improve groundnut production also need to address socio-economic constraints in growing areas. Therefore, this study seeks to identify socio-economic factors that contribute to low yields and stagnation of groundnut production in Tanzania with evidence from Urambo district of Tabora region.

1.3 Research Objectives

The primary objective of this study was to identify socio-economic factors limiting the groundnut production in the study area. Specifically, the study aimed to:

(i) Examine land tenure systems commonly practised and their influence on the quantity of groundnut harvested;

(ii) Analyse the nature and process of groundnut production;

(iii) Determine the contribution of groundnut production to the overall household income of smallholder farmers;

(iv) Determine and document the types of groundnut processing and value addition mechanisms commonly used by smallholder farmers; and

(v) Identify and document the socio-economic factors influencing groundnut production.

1.4 Research Questions

To achieve the research objectives, this study set out to answer the following research questions:

(i) How do various land tenure systems in the study area influence the quantity of groundnut harvested?

(ii) What features and processes typically explain the nature of groundnut production in the study area?

(iii) Does groundnut production contribute significantly to the overall household income of smallholder farmers? If yes, to what extent?

(iv) To what extent and in what ways do smallholder groundnut farmers add value to the product?

(v) What are socio-economic factors that severely limit groundnut production in Urambo district?

1.5 Justification of the Study

For Tanzania to achieve the first Millennium Development Goal on eradicating extreme poverty and hunger by 2015, and to create broad-based, equitable and sustainable growth as stipulated in the National Strategy for Growth and Reduction of Poverty (NSGRP), agriculture must receive due priority (URT, 2010c). To this end, the country adopted "*Kilimo Kwanza*" (or "Agriculture First"), a comprehensive national strategy for agricultural development. The strategy is based on ten actionable pillars with a focus on poverty reduction. The agricultural sector in the country does not only employ the majority of Tanzanians but also contributes significantly to total national income.

Groundnut production in Tanzania is not well developed compared with other African countries such as Nigeria. There is a need to transform the agricultural sector from smallholder subsistence farming into larger scale commercial farming. This study addresses socio-economic factors that limit groundnut production in Urambo district of Tabora region. The study aims to inform policy makers at both local and national level on short-and long-term policy responses to address socio-economic constraints on groundnut production in the area. By examining the process of land acquisition, ownership and utilization among smallholder farmers, the study further seeks to help smallholder farmers in planning and utilizing land sustainably. In addition, the study identifies affordable techniques to add value to groundnut production that can be used by producers to increase sales and profit.

1.6 Organisation of the Report

The report is organized into five chapters. Chapter one introduces the study. It presents the background to the research problem, statement of the problem, research objectives and questions, and justification of the study. Chapter two describes the theoretical framework underpinning the current research and reviews literature relevant to the study topic. Chapter three describes the methodology and tools used in the study. Chapter four presents and discusses the findings. Concluding remarks and recommendations are provided in chapter five.

2 Literature Review

2.1 Theoretical Framework

The theoretical framework underlying this study borrows insights and empirical contributions from the Farm Household Production Theories, which were cogently re-examined by Mendola (2007). The author pointed out that peasants with access to a piece of land mainly utilize family labour in farm production. According to Ellis (1992), peasants are fundamentally characterized by partial engagement in markets, which are often imperfect or incomplete. On the other hand, Mendola (2007) maintains that, peasants are located in large dominant economic and political systems that can affect production behaviour. Furthermore, Hunt (1991) as cited in Mendola (2007) identified peasant farms as being units for both production and consumption, implying that a proportion of produce is sold to meet their cash requirements and a part is consumed. In this context, Mendola (2007) emphasised that these units involve a variety of market and non-markets tasks, such as agriculture, pastoralism, fishing, crafts, and gathering of fruits, nuts, fuel-wood and water. The author further noted that peasant farmers typically work within developing markets that function sporadically and somewhat disconnectedly across locations and time.

The factors described in the farm household production theories have implications on producer behaviour and on the production decisions of smallholder farmers. Taylor and Adelman (2003) identified the classic economic models that incorporate household consumption goals into micro-economic models of peasant households' decision-making as 'agricultural-household' models – that is, they identify them as 'consumption and production' units, in both perfect and incomplete market contexts. This means that the typical Cobb-Douglas production function, which assumes constant returns to scale, based on restrictive assumptions of perfect competition in both factor and product markets, is inadequate to explain reasons for smallholder production behaviour. In this way, Cobb-Douglas production function is equally inadequate to provide answers for the study objectives.

2.2 Groundnut Production in Tanzania

Groundnut production in Tanzania dates back to 1946 (Wood, 1950). At that time mainland Tanzania, then known as Tanganyika, was a colony under British rule. Frank Samuel, the then head of the United Africa Company, a subsidiary of Unilever, came up with the idea for the colony to cultivate groundnut to produce vegetable oil. Both the idea and priority to introduce groundnut were exclusively based on the interests of the colonial government. The scheme intended to have large-scale state-managed commercial production for export. The first site for cultivation was Kongwa in central Tanganyika where local people had long been cultivating groundnut (*ibid*). This groundnut production scheme which was started during the colonial era was subsequently abandoned.

The production of groundnut in Tanzania is now mostly done through smallholder farming. Since groundnut is one of the key sources of household nutrition, women are mostly found labouring to produce the crop. Domestically, the crop is ranked third after cotton seeds and sunflower for providing edible oil. Generally, groundnut is a food crop which is consumed within the household though it can be sold to earn income (Sibuga *et al.,* 1992).

Groundnut is grown in areas which are below 1,500 metres in altitude. Cultivation is predominantly small in scale. Important growing regions include Mtwara, Tabora, Shinyanga, Kigoma, Dodoma and Mwanza. These regions receive annual rainfall varying between 500 mm and 1,200 mm (Mwenda *et al.,* 1985). Two of the principal growing zones, however, have different rainfall patterns during growing seasons. The rainfall in the first zone, which covers the regions of Mtwara, Ruvuma,

Kigoma, Shinyanga and Mwanza, is uni-modal, falling from October/November to May/June, with a brief dry spell of a few days to a few weeks in January or February (Mwenda, 1985). The other zone covers Morogoro region and the central and north-eastern parts of the country. This zone has a bi-modal rainfall distribution, with short rains in November/December and long rains from March to May/June.

Groundnut in the country is grown entirely under rain-fed conditions. It is usually intercropped with cereals or cassava. Normally, the crop is grown without application of fertilizers. Farmers grow groundnut on flat seedbeds on the tops of ridges, or just on the lower sides of these ridges. In part, adverse weather conditions, particularly unreliable rainfall, have been recognized as one of the factors responsible for low yields (Sibuga *et al.,* 1992).

2.3 Empirical Studies

Bucheyeki *et al.* (2008) conducted on-farm evaluation of promising groundnut varieties for adaptation and adoption in Tanzania. The study revealed that *Pendo* (1,444 kg/acre) and *Johari* (1,163 kg/acre) out yielded other varieties. Statistically, the sum of squares for genotypes and environments accounted for the most of the variability in yield, contributing 38% and 33% respectively. *Mamboleo* and *Sawia* varieties showed high genotype and environmental stability. Farmers and researchers ranked *Pendo* and *Johari* as the most preferred genotypes and the best varieties. In another study, Bucheyeki *et al.* (2010) identified drought and low-yielding varieties as the most serious problems in Tabora. The study also revealed that researchers' and farmers' variety selection criteria coincided. Based on the information generated by the study, *Pendo* and *Johari* were recommended.

Wabbi (2002) assessed factors affecting adoption of agricultural technologies in Kumi district, Eastern Uganda. The study revealed that farmers' participation in on-farm trial demonstrations, accessing agricultural knowledge through research, and prior participation in pest management training were associated with increased adoption of most Integrated Pest Management (IPM) practices. The size of a farmer's land holdings did not affect IPM adoption, suggesting that IPM technologies were mostly scale neutral, that is, IPM dissemination may take place regardless of farmer's scale of operation. According to Singh *et al.* (2008), farmers' perceptions of the harmful effects of chemicals did not influence farmers' decisions regarding IPM technology adoption, despite their high knowledge of this issue, suggesting that these farmers did not consider socio-economic, environmental or health impacts as important factors when choosing farming practices. Farmers' managerial capabilities were not important in explaining cowpea IPM technology adoption.

Mugisha *et al.* (2004) in their study on the adoption of IPM groundnut production technologies in Eastern Uganda revealed that adoption was significantly influenced by education, family size, membership of associations, extension visits, access to credit, and household income. A descriptive analysis indicated that lack of seeds, limited information about technologies, costly chemicals, labour intensiveness, and lack of land were reasons for non-adoption.

A study by Kimmins *et al.* (1999) proved that in many Sub-Saharan African (SSA) countries, women were predominantly growing and managing groundnut crops. Therefore, cultivation of the crop had a direct bearing on the overall economic, financial and nutritional status of women and children in the household. According to the authors, other factors that contributed to declining groundnut production were drought, disease epidemics and climatic variability.

Ramadhani *et al*. (2002) noted that despite the importance of groundnut in Tanzania, yields are still low. For the past 10 years, groundnut production has experienced two production patterns with relatively high yields of about 600 and 500 kg/acre. The reasons for low yields in the country are still not well understood. Therefore, the current paper documents socio-economic factors limiting groundnut production in Tanzania based on evidence from Urambo district in Tabora region.

2.4 Research Gap

The empirical studies reviewed above show that most scholars have concentrated on researching agricultural technology, groundnut diseases, groundnut varieties, and the climatic factors hindering groundnut production as well as the contribution of groundnut to household income for poverty reduction. Research efforts have paid little attention to the socio-economic factors limiting groundnut production among smallholder farmers. This study seeks to reduce this knowledge gap by examining the socio-economic circumstances facing smallholder groundnut farmers in the Tabora region of Tanzania.

3 Methodology

3.1 Study Location

This study was carried out in Urambo district of Tabora region. Urambo is one of the seven districts of Tabora region. Others include Tabora Municipality, Uyui, Nzega, Igunga, Sikonge and Kaliua. The district covers an area of 25,995 square kilometres and has a population of 369,329 people, of whom 340,348 live in rural areas. This proportion comprises about 92.2% of the total population (URT, 2003). Urambo was selected for the study because it is not only the largest district in Tabora region, but it also produces more groundnut than the other districts in the region.

All divisions of Urambo district, namely Urambo, Ussoke, Songambele and Ukondamoyo, were involved in the study. The following five wards were included in the sample: Muungano, Vumilia, Songambele, Usisya and Ussoke. Kaliua and Ulyankulu (two former divisions of Urambo district) were not included in the sample because they now form the new Kaliua district.

3.2 Research Design

A mixed-method research design was applied that combined qualitative and quantitative approaches. Gerring (2007) refers to this design as a "*qual quant*" approach. Alternatively, Saunders *et al.* (2007) refers to this approach as an "integrated research paradigm". An integrated research paradigm combines various schools of philosophy, such as positivism and realism, within the research design. According to Saunders *et al.* (2007), the mixed-method design is normally used when researchers are interested in gaining a rich and deeper understanding of a research problem.

The choice of this design allowed the research team to gather qualitative and quantitative from study participants. This design was preferred as it supported a variety of analytical techniques including econometric and non-econometric analyses. The qualitative methods used in the study are: focus group discussions, key informant interviews, and observation. Survey and documentary review were applied to gather quantitative information.

3.3 Sampling Techniques

The household was the study's unit of analysis. The heads of households from both groundnut-producing and non-groundnut-farming households were included in the study. The sample size was 400 household heads. The sample size was determined based on the formula developed by Fisher *et al.* (1991) for a population that exceeds 10,000 (Appendix I).

The sub-samples were proportionately obtained based on the number of households in participating villages. Table 1 lists the number of households sampled in each village.

Table 1: Number of households in sample study, by village

Name of village	No. of households in sample
Muungano	30
Vumilia	27
Songambele	42
Usisya	20
Ussoke	13
Uhuru	18
Usongelani	29
Sipungu	19
Kalemela A	32
Kalemela B	47
Mabundulu	17
Itegamatwi	20
Katungulu	31
Jioneemwenyewe	55
All villages	**400**

Within each village, households were purposively selected. Purposive sampling was adopted in order to avoid including inactive farmers who might have been included if simple random sampling had been used.

In general, the larger the sample is, the more reliable and consistent the outcomes to the study parameters in question. Likewise, the larger the sample, the more likely it is to have a representative number of the target population from which the sample is drawn (Saunders *et al.* 2007). The sample size of 400 was considered adequate for the current study because, according to Hair *et al.* (2006), any sample size usually suffices for descriptive statistics. However, a sample size between 200 units and 500 units is needed for multiple regression, analysis of variance (ANOVA) or log-linear analysis. The final sample of 400 households was within the required range for rigorous statistical and econometric analyses to be carried out (Amin, 2005; Sudman, 1976).

The sampling procedure adopted a combination of approaches including multistage, simple random sampling (SRS) and purposive sampling. Multistage sampling was used to identify the survey areas, that is, divisions, wards and villages. Purposive sampling was applied to select groundnut growers as well as non-growers. Using simple random sampling, 270 groundnut growers and 130 non-groundnut growers of mixed gender were selected.

3.4 Types and Methods of Data Collection

Both primary and secondary data were collected. Primary data included acreage, sources of labour, costs of labour and inputs, types of inputs, crops grown in the area, yield, price, demographic characteristics, income and income sources. Secondary information included the number of groundnut growers and non-growers, the number of inhabitants in each village, as well as the population size of the district and its growth rate.

Primary data were collected using a survey method. Secondary data were collected using documentary review. The methods are explained in detail below. The survey was the main data collection method, complemented by data obtained through focus group discussions (FGDs), key informant interviews (KIIs), observation and documentary review.

3.4.1 Survey

A survey questionnaire was administered to all 400 household heads. The survey included both open-ended and closed-ended questions. The survey was conducted between September 2010 and January 2011. Respondents were met at their homes and were asked for their consent to participate in the study. Those who agreed to participate in the study were requested to provide information concerning the previous year's groundnut production. Of note, not one of the potential respondents approached by the researchers refused to participate in the study.

3.4.2 Focus Group Discussions

Two focus group discussions were conducted using an FGD guide with pre-determined questions. The first FGD was at Jioneemwenyewe village in Songambele division on 16 September 2010. The second FGD was on 21 September 2010 at Uhuru Village, which is located in Vumilia ward, Ukondamoyo division. A systematic sampling technique was employed to select two divisions out of the four divisions in the district.

Thereafter, wards and villages in the two selected divisions were chosen using the simple random sampling technique. Each of the discussions consisted of 10 participants, including at least five female participants. The FGDs were guided by one facilitator, whose duty was to moderate and guide the discussion. The FGD guide consisted of general questions which explored important topics related to the study objectives.

3.4.3 Key Informant Interviews

This method was adopted in order to gain in-depth understanding of the groundnut sector in the study area. Three key informants, including one woman, were interviewed from three different wards: Vumilia, Kalemela and Songambele. The informants were of different ages, ethnicity, religious affiliation and educational level. The informants were selected based on their training and personal knowledge/experience with the groundnut sub-sector. The first informant was an extension officer who had worked in the study area for more than ten years. The second one was an experienced groundnut farmer who had grown the crop for the last 13 years. The third one was a former groundnut farmer who had switched to tobacco growing. The informants were also selected based on their ability to express themselves clearly. Each interview took about one and a half hours and was tape recorded. Notes were made after each interview from which key themes were identified.

3.4.4 Observation

In addition, researchers used observation as one of the data collection methods. They observed types of storage facilities known as "*vihenge*". The research team also observed a typical market day at Urambo district marketplace where groundnuts were seen packed in sacks for sale. Each sack consisted of six tins of nuts. In this marketplace, groundnut is normally sold in sacks without weighing. Very few groundnut sellers sold unshelled groundnut by weight in kilograms.

3.4.5 Documentary Review

This method was employed to gather secondary information which otherwise could not be gathered using the other methods. The information obtained included the number of groundnut growers and non-growers, number of inhabitants in each village, as well as the population size of the district

and its growth rate which were obtained from district reports and village records. The *Poverty and Human Development Report 2011* was also reviewed. This report was useful in triangulating information regarding poverty and livelihood status in Tanzania.

3.5 Data Analysis Techniques

Data were analysed using the Statistical Package for Social Sciences (SPSS) as well as Microsoft Office Excel 2007. Descriptive statistics such as mean, mode, range, sum, frequencies, percentages, maximum, minimum, variance and standard deviations were generated and used to examine land acquisition, ownership and utilization among smallholder farmers. These statistics were further used to analyse the nature and process of groundnut production in the study area, and to identify and document the different types of groundnut processing and value addition mechanisms applied by farmers.In addition, the data were used to examine land tenure systems practised in the study area. ANOVA was used to examine variations in the quantity of groundnut harvested between various land tenure systems. To determine the contribution of groundnut production to the overall household income of smallholder farmers, descriptive statistics and gross margin analysis were used. A multivariate regression technique was applied to identify and document socio-economic factors influencing groundnut production in the study area.

3.5.1 Model Specification

There are several ways of specifying a production function. In general mathematical form, a production function can be expressed as:

$$Y = f(X_1, X_2, X_3, \ldots\ldots X_n) \quad \ldots\ldots (1)$$

where,

$Y =$ output

$X_1, X_2, X_3, \ldots\ldots X_n$ = inputs

This general form does not encompass joint production (that is a production process, which has multiple co-products) or outputs (Heathfield, 1971). The left-hand side of the model specifies the dependent variable, Y, for groundnut output which depends on an array of factors or explanatory variables known as independent variables. Using an equation usually implies continual variation of output with minute variations in inputs, which is simply not realistic. Fixed ratios of factors, as in the case of labourers and their tools, might imply that only discrete input combinations, and therefore, discrete maximum outputs, are of practical interest (Shephard, 1970). In its estimated form, the model can be represented as:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots . \beta_n X_n \quad \ldots\ldots (2)$$

where,

$\alpha, \beta_1 - \beta_n$ = are coefficients or parameters that are quantitatively determined empirically.

The effects of multicollinearity were tested using Variance Inflation Factor (VIF). Multicollinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated (Farrar & Glauber, 1967; O'Brien, 2007; Hollar, 2010). In this situation, the coefficient estimates may change erratically in response to small changes in the model or the data. The variance inflation factor (VIF) test is regarded as one of the most rigorous diagnostic

tests for multicollinearity in the regression model (Belsley, Kuh, & Welsch, 1980). Multicollinearity is a problem if the VIF is greater than 10 (Belsley *et al.*, 1980; Wooldridge, 2001). The VIF test shows that all the variance inflation factors are smaller than 2, indicating that there is no serious multicollinearity problem. Therefore, all variables with VIF of 10 and above were not included in the model.[1] Bearing that in mind and on the basis of equation 2, the following model was estimated:

$$Y = \alpha + \beta_1 HHS + \beta_2 CLS + \beta_3 SEX + \beta_4 TOI + \beta_5 PRI + \beta_6 HSF + \beta_7 EDC + \beta_8 COS + \beta_9 COP + \varepsilon \quad \ldots\ldots(3)$$

where,

Y = Yield in kg/acre
HHS = Household size (Number of adults aged 18-60 years in a household)
CLS = Cultivated land size in acres
SEX = Sex of the farmer (dummy variable: 1 = male, 0 = female)
TOI = Total off-farm income in Tanzanian shillings (Tshs)
HSF = Hours spent farming/day
PRI = Previous year's price of groundnut in (Tshs/kg)
EDC = Education of the farmer measured as the number of years a farmer spent in school
COS = Cost of seeds in Tshs/kg
COP = Cost of pesticides in Tshs
ε = Error term
$\beta_1 - \beta_n$ = Regression coefficient to be estimated
α = constant term.

3.5.2 Gross Margin Analysis

Gross margin analysis was used to assess the profitability of various major crops produced in the district. Gross margin or gross margin ratio or gross profit margin ratio is the ratio of gross profit of a business to its revenue (Aburajab-Tamimi & Alqouqa, 2009). Gross profit margin ratio is calculated as follows:

Gross profit margin ratio = $\frac{Gross\,Profit}{Revenue} x100$ ……..1

In this study, gross profit was calculated as Total Average Annual Earnings (TAAE) from sales of a crop in Tshs minus Total Average Cost (TAC) of inputs in Tshs used in growing a particular crop. Therefore, the formula for calculating gross profit margin ratio for various crops was estimated as:

Gross profit margin ratio = $\frac{TAAE - TAC}{TAAE} x100$ ……..2

[1]Regarding issues of multicollinearity, Hollar (2010) suggests small tolerance values of less than 0.100 or VIF of greater than 10 for the variable under investigation should not be entered into the regression model. All variables under investigation had tolerance values greater than 0.100 and a VIF of less than 10. Tolerance values ranged from 0.806 to 0.984 and VIF values ranged from 1.016 to 1.241.

Where,
TAAE = Total Average Annual Earnings from Sales of a Crop in Tshs
TAC = Total Average Cost of Inputs in Tshs

Crops grown in the study area include groundnut, maize, sorghum, millet, cassava, sweet potatoes, fruits, vegetables, tobacco, beans, sunflower, rice and sugarcane. Of these crops, maize, tobacco, groundnut, cassava, beans, vegetables, sweet potatoes and rice are the main crops grown by many farmers. In order to perform gross margin analysis, the total average cost of inputs, such as seeds (Tshs/kg), fertilizer (Tshs/kg), chemicals (Tshs/kg), pesticides (Tshs/kg) and farm implements, were first estimated. Then, the total average annual earning from sales of a particular crop (Tshs/kg) was estimated. The value of the yields was estimated using the market price of the season in which crops were grown. The cost for using family labour was not considered in the equation due to the complexity involved in its calculations.

3.6 *A Priori* Expectations

Household size (number of adults aged 18-60 years) was included in the model to establish how this variable influenced the yield in the study area. It was hypothesized that as household size increases, yields also increases. In smallholder farming (or farming under the peasant system), the household is the major source of labour (Doss, 1999; Mendola, 2007). Therefore, the larger the household size, the greater the labour force, and, in turn, the larger the area of land able to be cultivated. With a larger area of land under cultivation, one would expect higher yields.

Farm size (number of acres under cultivation) was expected to influence yield. The larger the farm size, the higher the yield. In their study of sweet potato, Onaiah *et al.* (2007) found that farm size significantly increased output.

Sex of the farmer was included in the model as a dummy variable (1 if the farmer was a male and 0 if the farmer was a female). It was hypothesized that the sex of a farmer does not impact yield, i.e., yield does not depend on the farmer's sex.

Total off-farm income was measured as the total amount of money in Tshs that a farmer earns from off-farm activities, such as petty trading. Off-farm income was hypothesized to influence the groundnut yield positively. It was assumed that a farmer will use off-farm income to buy inputs such as seeds, pesticides and land for groundnut farming.

Hours spent farming was hypothesized to influence yields positively. This is because, other factors being constant, the more time a farmer spends working on the farm, the bigger the area that is cultivated (farm size) which in turn increases the yield.

Concerning the effects of **previous year's price** on yield, it was assumed that a higher price in the previous farming season will induce farmers to produce more in the following season in order to get more profit. Hence, the higher the previous year's price, the higher the yield. This actually follows the laws of demand and supply, which entails that the quantity supplied correlates positively with price while quantity demanded correlates negatively with price. However, due to time lag in farmers' responsiveness to changes in product price, the previous year's price is taken to be a good guide to farmers' production decisions in the current year.

Education of a farmer was also included in the model to test the extent that it affects yield. Education was measured as the number of years a farmer spent in school. It was assumed that the higher the level of education of a farmer, the higher the yield. According to Weir (1999), education may have both cognitive and non-cognitive effects upon labour productivity. Cognitive outputs of schooling include the transmission of specific information as well as the formation of general skills and proficiencies. Education also produces non-cognitive changes in attitudes, beliefs and habits. Increasing literacy and numeracy may help farmers to acquire and understand information and to calculate appropriate input quantities in a modernizing or rapidly changing environment. Improved attitudes, beliefs and habits may lead to greater willingness to accept risk, adopt innovations, save for investment and generally to embrace productive practices.

It was important to include the **costs of inputs** (seeds and pesticides) in the model because inputs may affect yields. It was hypothesized that the cost of inputs affects groundnut yield negatively. The higher the costs of inputs, the lower the yield. This is because smallholder farmers with low capital in most cases cannot afford to pay higher input prices. Table 2 presents a summary of the variables included in the analysis.

Table 2: Summary of variables included in the regression analysis

S/No.	Variable	Code	Unit	Scale	Category	Expected significance
1	Yield	Y	kg/acre	Ratio	Dependent	
2	Household size	HHS	Number of adults	Ratio	Independent	Positive
3	Cultivated land size in acres	CLS	Acres	Ratio	Independent	Positive
4	Sex of the farmer	SEX	Dummy variable: 1if a male, 0 if a female	Nominal	Independent	No impact
5	Total off-farm income in Tshs	TOI	Tshs	Ratio	Independent	Positive
6	Cost of pesticides in Tshs	COP	Tshs/kg	Ratio	Independent	Negative
7	Previous year's price	PRI	Tshs /kg	Ratio	Independent	Positive
8	Education level	EDC	Number of years of schooling	Ratio	Independent	Positive
9	Cost of seeds in Tshs	COS	Tshs	Ratio	Independent	Negative
10	Hours spent farming	HSF	Hours	Ratio	Independent	Positive

3.7 Ethical Consideration

This study considered ethical issues as advocated by Driscoll and Brizee (2012). In social science research, a code of ethical principles requires researchers to obtain informed consent from all respondents, protect respondents from harm and discomfort, treat all information confidentially, and explain the experiment and the results to the respondents afterward.

3.8 Limitations of the Study

This study encountered a number of methodological limitations which if not addressed would have affected the validity of the research findings. The limitations were:

(i) Self-reported data

This study relied on information provided by the respondents. These self-reported data could rarely be verified independently. In other words, researchers had to record what people said, whether in interviews and focus group discussions or on questionnaires, at face value. However, these data contain potential sources of bias that should be noted as limitations. One limitation is selective memory, that is, remembering or not remembering experiences or events that occurred at some point in the past, such as the previous year's price or yield for a crop.

Another limitation that was noted within this category is attribution. Attribution refers to the act of attributing positive events and outcomes to one's own agency but attributing negative events and outcomes to external forces. For example, high yields were attributed to a household's good performance and hard work, while low yields were attributed to government failure to provide extension services and subsidies. Furthermore, exaggeration was also noted. Exaggeration refers to the act of representing outcomes or embellishing events as more significant than is actually suggested from other data.

These limitations were overcome through triangulation of data in which village and district level records were gathered to verify data collected from respondents. In addition, the few available extension officers were also consulted. Other methods used to verify information provided by individual respondents were focus group discussions and key informant interviews.

(ii) Access

This study depended on access to the household head. In some households, the household head was not available or not easily accessible. This problem was solved by interviewing a spouse if the household head was married. In cases where the head of household was single or both head of household and spouse were not available, researchers selected another household.

(iii) Researchers being viewed as government officials

In some cases, researchers were viewed as government agents. Hence, respondents requested them to solve a range of local problems, for example, poor roads, low prices, limited access to clean and safe water, and high primary school drop-outs to name just a few. To overcome this issue, researchers requested the Village Executive Officer (VEO) to accompany them to respondents' households and explain their role as researchers.

4 Results and Discussion

4.1 Land tenure systems commonly practised in the study area

Under the Land Act 1999 and the 1995 National Land Policy, land is "not owned" but is vested in the Presidency and availed to users through a mechanism which is centred on the Minister responsible for Lands, Commissioner of Lands and the land administration system revolving around that office. Under this system, the land user temporarily owns the land rights and any improvements to the land. Land rights can either be granted or deemed to have been granted, and certificates are issued and registered to prove the identity of the rights owner (Lugoe, 2008). It is important to note that even though all land is regarded as public land, the 1999 Land Act and Village Land Act, which became operational in 2001, created three categories of land: (i) general land, (ii) reserve land and (iii) village land (LRRRI, 2011).

Basically, there are two ways in which a person can own or acquire land in Tanzania: (i) through "granted right of occupancy" and (ii) through "customary right of occupancy". Both of these two ways are legally restricted to Tanzania citizens (LRRRI, 2011). However, a third way of acquiring land, that is, through investmest, accommodates land acquisition by non-citizens.

The Tanzania Investment Centre has listed five forms in which a foreign investor may occupy land in Tanzania. They are:

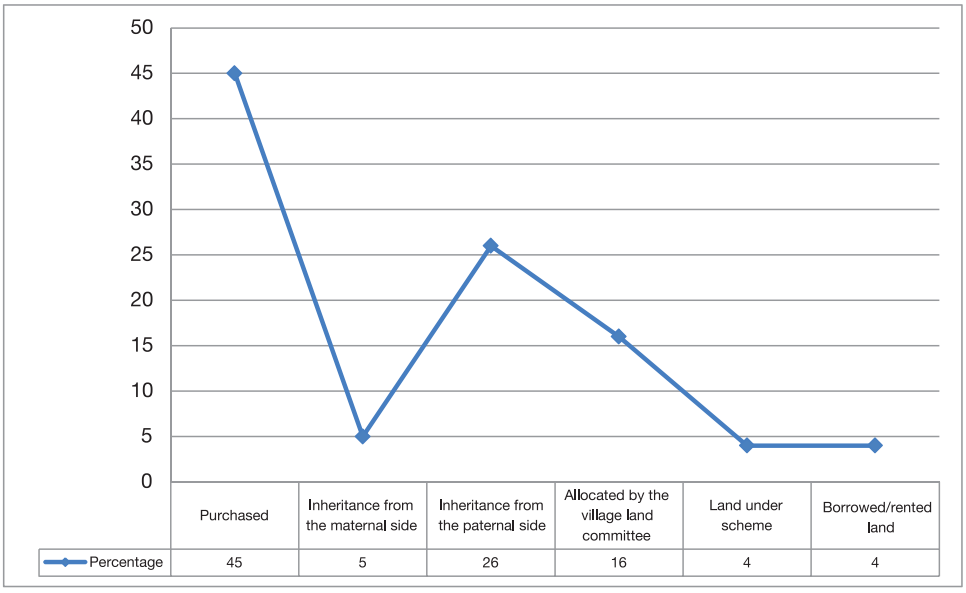
i. derivative rights under Section 20(2) of the Land Act 1999;
ii. application to the Commissioner for Lands for grant of right of occupancy under Section 25 (1) (h) and (i) of the Land Act 1999;
iii. sub-leasing from the private sector;
iv. license from the Government; and
v. purchase from other holders of granted right of occupancy (URT, 2010b).

In the current study, nearly half of the smallholders surveyed (45%) in Urambo district purchased their land, 26% acquired land through inheritance from the paternal side of their families and16% of respondents acquired land through village land committees. Likewise, groundnut farmers allocated land under scheme[2] and those who borrowed or rented land comprised 4% each (Figure 1). It is not suprising that among those who inherited land, majority inherited from paternal side. In sub-Saharan Africa both formal law as well as customary practice contribute to women's limited access, control and ownership of land. In many cases, statutory law is non-discriminatory, gender-neutral and provides for equal rights. However, this is largely ineffective as customary regimes with patriarchal norms prevail[3]. Gender-neutral laws particularly are constantly operating in a predominantly gendered social, economic and cultural context. Importantly, the study found that most smallholder farmers in Urambo district acquired land through customary rights of occupancy. The study also found that very few women owned land compared with men. More than three-quarters of males owned land compared with less than a fifth of their female counterparts. Interviewed smallholder farmers reported that even if majority of them own larger plots of land they only cultivate small areas that they can manage properly with the labour force they have. This is because, the same labour is used for other crops such as tobacco which is labour intensive as well. Respondents also reported that in the case of married couples; sometimes husbands concentrate with tobacco and let groundnuts to

[2] Pot of land allocated for the Association of Tanzania Tobacco Traders' tree planting project, part of which occasionally the primary farmer co-operatives rent out (free of charge) to groundnut farmers who have limited or no land. The fact that, groundnut is not a permanent crop makes easy for tree planting to continue next season.
[3] Hellum, Anne, University of Oslo, "How can a focus on the rights to land and related economic resources make a difference for poor women in Africa? Seven concerns"

be managed by their wives. Because, in most groundnut growing families, groundnut production is deemed to be women's business, household heads, especially men, do not give this crop deserved weight and attention.

Figure 1: Land tenure systems used by smallholder farmers in Urambo district



Source: *Survey data, 2010*

Table 3 compares groundnut yield per each land tenure system practised by smallholder farmers in Urambo district. The findings shows that, groundnut yield did not differ significantly between different land tenure system practised in the district. The Tukey HSD produced a p-vaue > 0.05 in all the land tenure systems. Hence, the hypothesis that groundnut yield vary per land tenure system is rejected.

Table 3: Results from Tukey HSD tests comparing groundnut yield and type of land tenure practised by smallholder farmers surveyed

(I) Land tenure system	(J) Land tenure system	Mean Difference (I-J)	Std. Error	p-value	95% Confidence Interval	
					Lower Bound	Upper Bound
Purchased	Inherited from maternal side	-1.45159	2.01660	.979	-7.2267	4.3235
	Inherited from paternal side	-1.52675	1.01488	.662	-4.4332	1.3797
	Village land	-.56964	1.19011	.997	-3.9779	2.8386
	Land under scheme	-.88214	2.12781	.998	-6.9758	5.2115
	Borrowed/rented	-.63714	1.74189	.999	-5.6256	4.3513
Inherited from maternal side	Purchased	1.45159	2.01660	.979	-4.3235	7.2267
	Inherited from paternal side	-.07516	2.08281	1.000	-6.0399	5.8896
	Village land	.88194	2.17358	.999	-5.3428	7.1067
	Land under scheme	.56944	2.79923	1.000	-7.4470	8.5859
	Borrowed/rented	.81444	2.51839	1.000	-6.3977	8.0266
Inherited from paternal side	Purchased	1.52675	1.01488	.662	-1.3797	4.4332
	Inherited from maternal side	.07516	2.08281	1.000	-5.8896	6.0399
	Village land	.95711	1.29915	.977	-2.7634	4.6776
	Land under scheme	.64461	2.19067	1.000	-5.6290	6.9182
	Borrowed/rented	.88961	1.81814	.997	-4.3172	6.0964
Village land	Purchased	.56964	1.19011	.997	-2.8386	3.9779
	Inherited from maternal side	-.88194	2.17358	.999	-7.1067	5.3428
	Inherited from paternal side	-.95711	1.29915	.977	-4.6776	2.7634
	Land under scheme	-.31250	2.27715	1.000	-6.8338	6.2088
	Borrowed/rented	-.06750	1.92146	1.000	-5.5702	5.4352
Land under scheme	Purchased	.88214	2.12781	.998	-5.2115	6.9758
	Inherited from maternal side	-.56944	2.79923	1.000	-8.5859	7.4470
	Inherited from paternal side	-.64461	2.19067	1.000	-6.9182	5.6290
	Village land	.31250	2.27715	1.000	-6.2088	6.8338
	Borrowed/rented	.24500	2.60830	1.000	-7.2247	7.7147
Borrowed/ rented	Purchased	.63714	1.74189	.999	-4.3513	5.6256
	Inherited from maternal side	-.81444	2.51839	1.000	-8.0266	6.3977
	Inherited from paternal side	-.88961	1.81814	.997	-6.0964	4.3172
	Village land	.06750	1.92146	1.000	-5.4352	5.5702
	Land under scheme	-.24500	2.60830	1.000	-7.7147	7.2247

Note: *Dependent variable: yield in kg/acre*

4.2 Nature and Process of Groundnut Production in the Study Area

On average, 8 bags of groundnut (equivalent to 192 kg) per acre were harvested by each groundnut-growing household; with major of them harvesting 4 bags (96 kg) per acre. This indicates that groundnut production per hectare is low compared with the estimated minimum yields of local groundnut varieties. Bucheyeki *et al.* (2010) established that local varieties produce between 200 kg/acre (499 kg/ha) and 309 kg / acre (772 kg/ha).

Of the groundnut harvested, 4 bags of unshelled groundnuts (equivalent to 98 kg) are consumed by the household with part of the harvest retained as seed stock for the following season. The remaining groundnuts are either sold or reserved as seeds for the next season.

The study recorded an average market price of Tshs 7,372 per bag for shelled groundnut and an average of Tshs 6,326 per bag for unshelled groundnut. Therefore, the price differential between unshelled and shelled groundnut was only Tshs 1,045 (or about 16.5%), a margin which is unlikely to induce farmers to process their produce.

The selling points were located far from the surveyed farming households. On average, the distance from farmers' homes to the nearest selling points was 11km; with majority of groundnut farmers travelling up to 6 km to reach the nearest selling point. The implication is that farmers were always required to travel long distance in search for the market; the situation which is difficult given limited means of transport facing most farmers in the area. Most respondents when asked they reported to have been using bicycles and cattle carts to transport their products to distant market places most of which are located in town. When an individual does not own a bicycle or carts he/she will have to borrow or rent from the neighbour. In most cases the costs for renting are very high. More results on groundnut farming are provided in Table 4.

Table 4: Data on groundnut farming

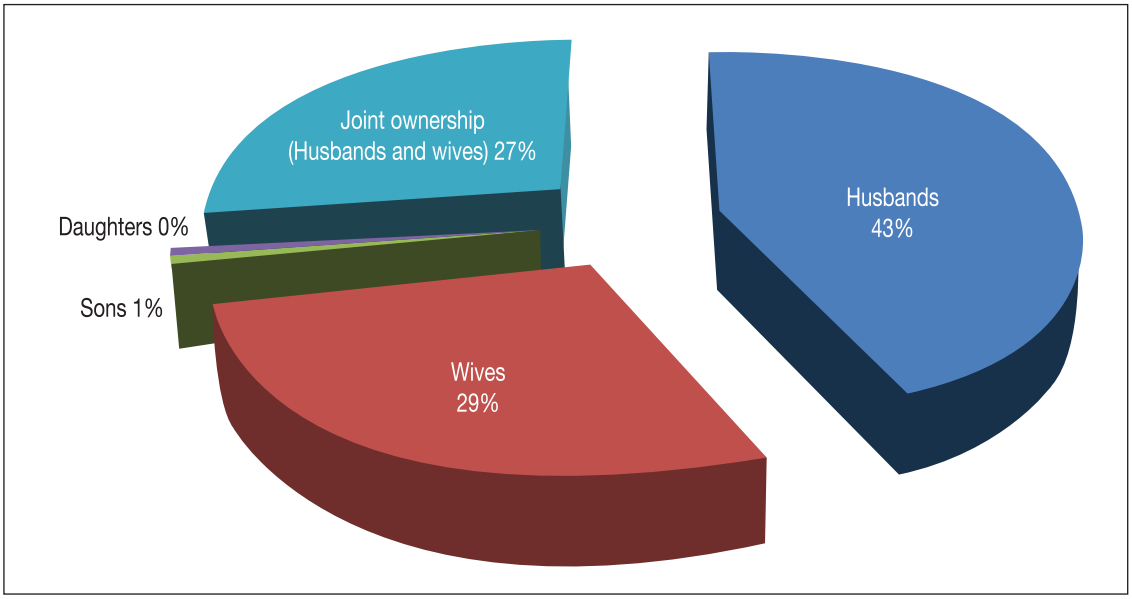
Variable	N	Max.	Min.	Range	Mean	Mode	Median	Sum
Quantity harvested (bags)	360	69.50	0.50	70	8	4	5	2746
Quantity consumed (bags)	326	72	0.50	30.50	4	2	2	1,078
Quantity sold (bags)	268	72	.25	71.75	6	2	4	1676
Price shelled g/nuts (Tshs/bag)	268	42,000	12,000	30,000	7,372	7,000	18,000	6,948,479
Price of unshelled g/nut (Tshs/bag)	268	35,000	5,000	35,000	6,327	5,000	3,500	2,530,603
Distance (km) to selling point	58	90	1	89	11	6	7	650
Cost of seeds Tshs/bag	270	240,000	0	240,000	22,333	30,000	18,000	6,029,808
Cost of pesticides in Tshs/bag	26	27,000	3,000	24,000	15,000	3,000	15,000	30,000

Source: *Survey data 2010*

The cost of inputs exceeded earnings by huge margin. On average cost of seeds was 22,333 Tshs/ bag and that of pesticides was 15,000 Tshs per bag. This partly explains why most smallholder groundnut farmers in Urambo do not apply pesticides to kill insects and cure groundnut diseases. Responses from focus group participants showed that the majority of farmers preferred to use part of their produce as seeds rather than buying seed stock. This tendency to apportion previous produce as seeds for the coming season might have compromised the quality of seed varieties and yields. In most cases, yields are determined, among other things, by the quality of seed (Bucheyeki *et al.,* 2010). Data from FGDs further revealed that most farmers did not buy farm inputs. Few farmers used fertilizers and pesticides as these inputs were typically purchased for tobacco production. Thus, those farmers who could not afford to grow tobacco were unable to afford inputs for groundnut production.

In relation to groundnut selling and ownership of proceeds, 43% of respondents reported that husbands were responsible for selling the groundnut harvested and owned the proceeds. Less than a third (29%) of household heads reported that wives were responsible for selling and owned the proceeds. The remaining 27% of household heads reported joint ownership of cash and joint responsibility for selling the produce (Figure 2). These outcomes indicate gender inequality in the ownership of proceeds in almost half of the farming households surveyed. Wives were largely responsible for the cultivation of land and growing the crops, while husbands held the role to market the produce and kept the proceeds. The reason for this stems from African culture where husbands as the heads of households have a custodial role.

Figure 2: Responsibility for selling groundnut and ownership of proceeds



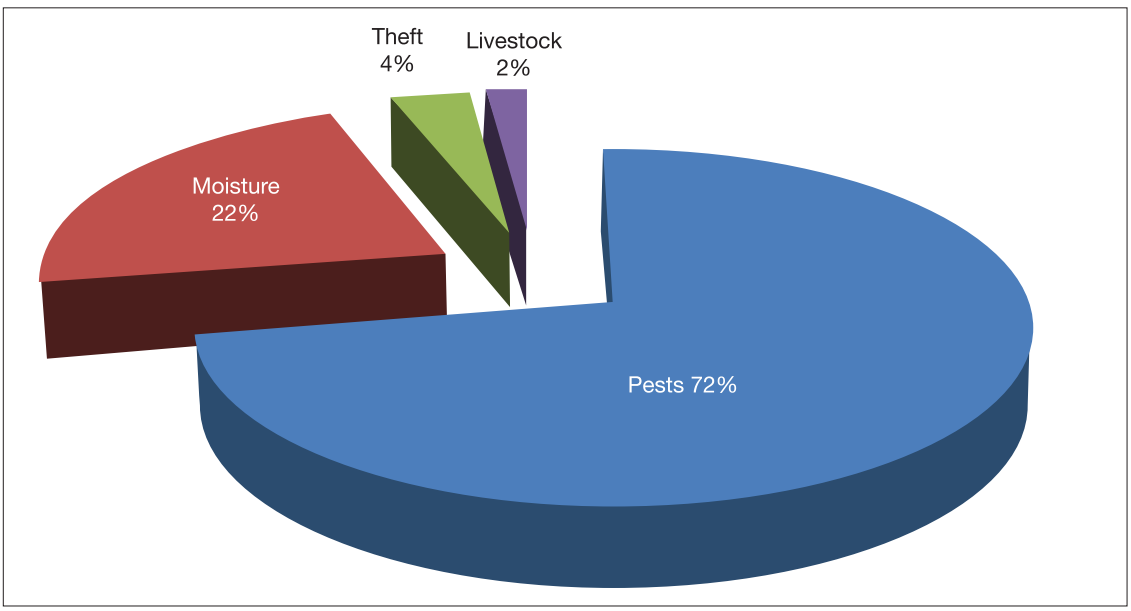
Source: *Survey data, 2010*

Analysis of the causes of groundnut losses in storage revealed that pests accounted for 72.2% of losses and moisture caused 22.2% (Figure 3). The majority of respondents reported that they reserved one room in their houses for storing the harvest. Other farmers stored their harvests in the traditional store referred to as '*kihenge*'. This is a locally-constructed (grain-shed) facility for storing harvests. It is normally built outside the house. These findings are in line with those of Nautiyal (2002) who observed that farmers generally have inadequate storage facilities and use their houses to keep bags of groundnut over long periods of time.

Therefore, pests were responsible for almost three-quarters of the storage loss in the study area. The literature shows that groundnut is susceptible to destruction by a number of pests and diseases that can cause considerable after-harvest losses (Ntare *et al.,* 2007). Nautiyal (2002) found that approximately 6 to 10% of groundnut kernels stored in bags are destroyed by insects. That study also noted that loss estimates should not only consider the quantity of nuts lost but deterioration in quality from storage.

Moisture was cited as the second major cause of harvested groundnut loss. To maintain the quality of kernels, groundnuts need to be stored within the appropriate ranges of temperature and relative humidity. But the study noted that farmers did not have clear understanding of the correct conditions to store their crops, and thus could not always adhere to the recommendations. They knew to protect groundnuts from moisture but not by how much. Ellis (1998) observed that seeds stored at higher temperatures (50°C) and moisture content of 10.1% deteriorated faster compared with other treatments, and complete loss of viability occurred within 10 days in both air- and vacuum-sealed conditions. According to Nautiyal (2002), smallholder farmers store unshelled groundnuts in earthen pots, mud bins, bamboo baskets or in other types of wicker receptacles. These containers are often plastered with mud and cow dung with little or no use of pesticides.

Figure 3: Major causes of groundnut loss in storage



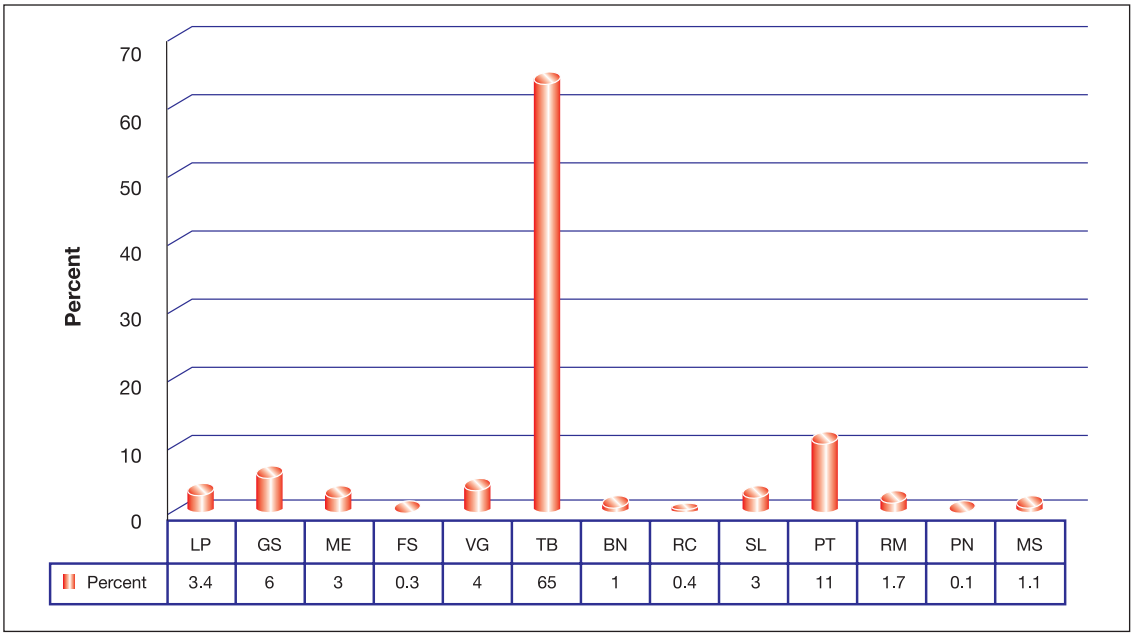
Source: *Survey data, 2010*

4.3 Contribution of groundnut production to overall household income

4.3.1 Sources of household income

Figure 4 shows that the main sources of household income in the study area were tobacco production (65%), petty trading (11%) and groundnut production (6%). Other sources included vegetable production (4%), livestock and livestock products (3.4%), maize production (3%) and salary and wages (3%). Income from other sources like remittances contributed only 1.7% of household income per year. Beans, masonry, rice, fruits and old-age pensions each contributed 1% or less of total household income. The results imply that farming is the major income-earning activity in the area.

Figure 4: Sources of household income in Urambo district



Source: *Survey data, 2010*

Note: LP = Livestock and livestock products; GS = Groundnut; ME = Maize; FS =Fruits; VG = Vegetables; TB= Tobacco; BN = Beans; RC = Rice; SL= Salary and wages; RM = Remittances; PT = Petty trading; PN = Pension; MS = Masonry.

4.3.2 Gross margin analysis

Table 5 presents results on the gross margin analysis for crops grown in the study area. Beans were the most profitable crop with a gross profit margin ratio of 87.04, while rice ranked second with a gross profit margin ratio of 82.70. Groundnut ranked third with a gross profit margin ratio of 77.19. However, the study assumed that family labour was freely supplied. Even if farmers perceived tobacco to be the most profitable crop in the area, the gross profit margin ratio indicated otherwise. Tobacco scored a gross profit margin ratio of 46.10 and ranked number eight in profitability among the sources of household income. The major reason for lower profitability was the high cost of inputs involved in growing the crop. Tobacco requires more inputs such as fertilizers, agro-chemicals,

pesticides and farm implements than any other crop in the district. It is important to note that although, cassava and sweet potatoes are among major crops they are not major sources of household income. This is because, they are mostly grown for household consumption and not for sale.

Table 5: Gross margin analysis of selected crops in the study area

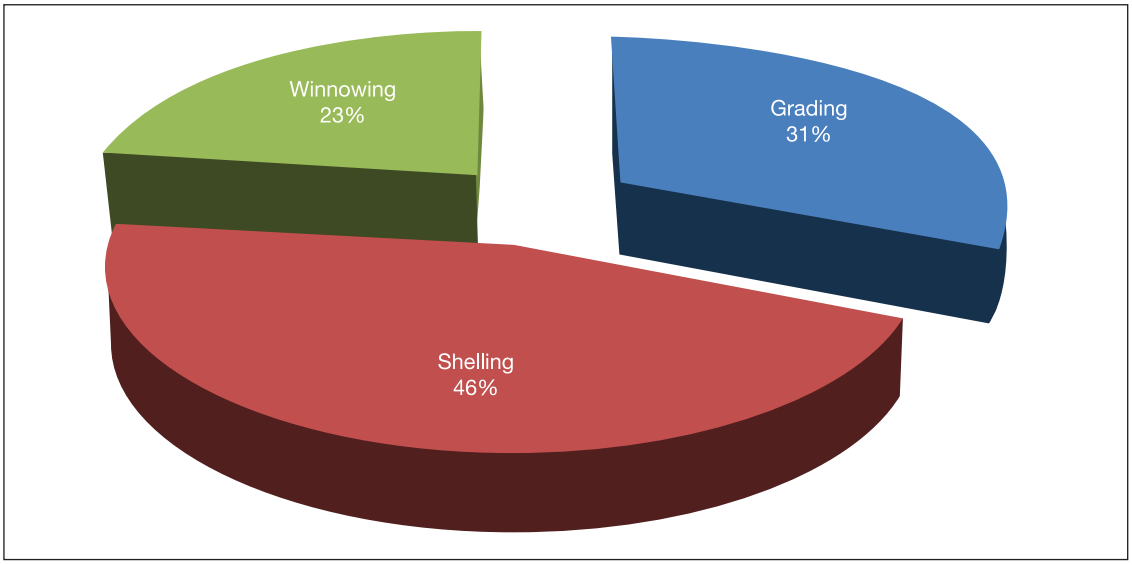
Crop	n	Total average cost of inputs (Tshs)	Total average annual earnings from sales of crop (Tshs)	Gross profit margin ratio
Groundnut*	270	43,554.00	190,915.75	77.19
Maize*	400	55, 618.54	141,073.93	60.57
Sorghum	112	25, 214.67	35,390.00	28.75
Millet	47	16,234.40	23,430.00	30.71
Cassava*	263	5600.00	11,086.47	49.49
Sweet Potatoes*	147	6,760.27	12,528.75	46.04
Fruits	69	18,672.10	34,972.50	46.61
Vegetables*	179	20,321.00	60,316.29	66.31
Tobacco*	300	547,238.46	1,015,314.51	46.10
Beans*	245	15,876.87	122,500.50	87.04
Sunflower	92	9,235.00	16,402.51	43.70
Rice*	136	20, 219.30	116,862.50	82.70
Sugarcane	74	2,087.00	4,765.00	56.20

Source: *Authors' calculations based on survey data, 2010; * Major crop*

4.4 Groundnut processing and value-addition mechanisms

Figure 5 presents the findings on groundnut processing among the households surveyed. Only 35 (or 13%) of the 270 groundnut farmers reported that they processed their production. Approximately half (46%) of respondents mentioned shelling as the main processing method used to add value to the produce. Around one-third (32%) of farmers reported grading as the main method of groundnut value-addition, while 23% of the respondents used winnowing as method of groundnut processing. Unlike grading and winnowing, shelling requires less concentration and supervision. Therefore, all household members including children could help in the exercise. Nautiyal (2002) maintains that shelling or decortication is a major method of adding value to groundnut. According to Akobundu (1998), farmers feel a need to value-add in order to increase their revenue from sale of their output. Given that official marketing channels only accept unshelled groundnut, farmers who shell nuts must sell them on the open markets, thereby further reducing the volume that moves through official channels.

Figure 5: Types of groundnut processing used by farmers to add value



Source: *Survey data, 2010*

The study asked respondents what factors limited groundnut processing. Overall, 15% of respondents cited inadequate knowledge to operate decorticating (shelling) machines as the reason for unprocessed groundnut, 31% of respondents reported limited technology as the problem and 11% said that customers preferred unprocessed groundnut. Another 29% cited a shortage of capital to purchase the necessary equipment as a limiting factor. A further 15% of respondents reported that the sale price for processed products did not cover the cost of production. Therefore, the sale price did not provide incentives to process the groundnut. For more details see Table 6.

Table 6: Factors limiting groundnut processing in Urambo district

Reason	Frequency	Percentage of responses	Percentage of cases
Lack of knowledge to operate shelling machine	120	15.2	39.0
Lack of technology/machines	244	30.9	79.2
Customers prefer unprocessed groundnut	85	10.8	27.6
Lack of capital to purchase machines	221	28.0	71.8
Price for processed groundnut is not attractive	119	15.1	38.6
Totals	**789**	**100%**	**256.2**

Source: *Survey data, 2010*

This survey question allowed multiple responses, hence, the number of observations exceeds the sample size

4.5 Socio-economic factors influencing groundnut production in the study area

Regression analysis was performed to test the extent to which the following independent variables – sex of the farmer, household size, total off-farm income in Tshs, cost of pesticides in Tshs, hours spent farming, education of the farmer, cost of seeds in Tshs, previous year's price in Tshs and cultivated land size in acres – affected groundnut yield. The overall fit of the model (F-test = 30.707 and P-value = 0.000) was statistically significant, which means the model has explanatory power to predict variations in the groundnut yield. Moreover, the adjusted R-square value indicates that 40.1% of the variation in groundnut yield is explained by the changes in the variables included in the model. Further results on the overall model fit are presented in Tables 7 and 8.

Table 7: Results of regression analysis (Model summary)

Model	R	R-square	Adjusted R-square	Std. error of the estimate	Change statistics				
					R-square change	F change	df1	df2	Sig. F change
1	.644[a]	.415	.401	6.28423	.415	30.707	9	390	.000

Note: *a = Predictors: (Constant), Sex of the farmer, household size, total off-farm income in Tshs, cost of pesticides in Tshs, hours spent farming, education of a farmer, cost of seeds in Tshs, previous year's price in Tshs, land size cultivated in acres.*

Table 8: Results of regression analysis (ANOVA[a])

Model		Sum of squares	Df	Mean square	F	Sig.
1	Regression	10914.125	9	1212.681	30.707	.000[b]
	Residual	15401.700	390	39.492		
	Total	26315.824	399			

Notes: *a. Dependent variable = Yield in kg/acre*
b. Predictors: (Constant), Sex of the farmer, household size, total off-farm income in Tshs, cost of pesticides in Tshs, hours spent farming, education of a farmer, cost of seeds in Tshs, previous year's price in Tshs, cultivated land size in acres.

The effect of previous year's price on groundnut yield was tested (at $p < 0.05$) and produced a highly statistically significant result with t-value = 13.665, p-value = 0.000 and $\beta = 3.284$. The findings indicate that for every one thousand shillings increase in the previous year's price of groundnut, yield increases by 3,284 kg. The higher price from the previous year induces farmers to produce more the following year. These results support the study's hypothesis related to price. The findings depict what economic principles suggest, that the higher the price of a product, the greater the supply of that product. When the price of a product increases, sellers perceive more profits, and, thus, increase production. But, in turn, the perceived increase in price affects the quantity demanded.

The analysis also tested (at $p < 0.05$) whether cultivated land size had any effect on the quantity of groundnut harvested. Results show a highly statistically significant finding with $\beta = 0.205$, t-value = 2.407 and p-value = 0.017. Moreover, the coefficient is positive indicating a positive association

between cultivated land size and groundnut yield. For every one acre increase in cultivated land size, yield increases by 205 kg. This means that the area of land cultivated is mostly associated with production per unit of area when other factors are kept constant. These findings support the study hypothesis and imply that cultivated land size is a good predictor of the quantity of harvested groundnut.

Cost of seeds was another strong predictor of the groundnut yield. The findings were statistically significant at β = -3.375, t-value = -2.077 and p-value = 0.038. The negative coefficient suggests that the cost of seeds negatively impacts groundnut yield. For every one thousand shillings increase in the price of seeds, yield drops by 3,375 kg. When seed becomes more costly, fewer farmers are able to afford the costs involved in growing groundnut. Hence, the cost of seeds generally reduces the number of farmers, which, in turn, reduces the size of land cultivated other variables remaining constant. These findings support the study's hypothesis related to the cost of seed.

Like the cost of seed, the cost of pesticides negatively impacts yield. The study tested (at $p < 0.05$) whether the cost of pesticides incurred had any effect on groundnut yield. The findings were statistically significant with β = - 0.001, t-value = -4.480 and p-value = 0.000. The negative coefficient suggests that the cost of pesticides impacts groundnut yield negatively. For every thousand shilling increase there is a drop in yield of 1,000 kg. While we acknowledge the fact that, pesticides may stop the destruction of the crop by pests/disease which might lead to improved yield; the cost of pesticides may affect farm size, assuming that farmers will cultivate a farm size which they can manage with little or no pesticides. As land size decreases, this will likely reduce the quantity of groundnut harvested. These findings support the study's hypothesis about the costs of inputs.

Another strong predictor of groundnut yield was the number of hours a farmer spent farming in a day. The findings were tested at $p < 0.05$ and produced a statistically significant results β = 0.234, t-value = 2.056, p-value = 0.040. The findings indicate that yield increases by 234 kg for every increase of one hour a farmer spent farming. This is because time spent farming correlates with land size cultivated; the more time spent farming, the larger the cultivated land size when all other factors are held constant.

Findings further show that sex of a farmer did not affect groundnut yield. These results were tested at $p < 0.05$ and produced a non-statistically significant result (β =1.201, t-value = 1.753, p-value = 0.080). Field interviews confirmed that groundnut in the study area is grown by both men and women. Like all other crops, the head of the household owns the produce regardless of his/her sex.

There was no statistically significant linear dependence of the yield on the education level of a farmer (β = - 0.140, t-value =-1.214 and p-value = 0.225). This means that a farmer's education is not a good predictor of the groundnut yield. This is consistent with Appleton and Balihuta (1996) who found that farmer's education was not a significant variable in two surveys they conducted.

Farmers' household size is not a predictor of groundnut yield as findings were not statistically significant at $p< 0.05$ with β = - 0.319, t-value = -1.088 and p-value = 0.277. Although not statistically significant, groundnut farmers during focus group discussions and interviews reported that the household was their major source of labour. The non-significance of the results may be

due to the fact that this study did not quantify the individual contributions to household's labour supply.

Total off-farm income did not impact groundnut yield. The findings were not statistically significant at $p<0.05$ with β = 6.090, t-value = 1.606 and p-value =.109. Very few farmers interviewed reported involvement in off-farm activities. This is because nearly all groundnut farmers are also tobacco farmers. Tobacco farmers are involved in the crop all year round except for a very short time to rest which does not exceed one month.

Table 9 presents a summary of the regression results for socio-economic factors influencing groundnut production in the study area.

Table 9: Results of regression analysis (Coefficients[a])

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	β	Std. Error	β			Tolerance	VIF
(Constant)	.987	1.216		.811	.418		
Cultivated land size in acres	.205	.085	.107	2.407	.017	.766	1.306
Hours spent farming	.234	.114	.081	2.056	.040	.967	1.034
Cost of seeds in Tshs	-3.375	.000	-.085	-2.077	.038	.897	1.114
Cost of pesticides in Tshs	-.001	.000	-.186	-4.480	.000	.871	1.149
Total off-farm income in Tshs	6.090	.000	.063	1.606	.109	.963	1.039
Previous year price in Tshs	3.284	.000	.575	13.665	.000	.847	1.181
Education of the farmer	-.140	.115	-.049	-1.214	.225	.933	1.072
Sex of the farmer	1.201	.685	.069	1.753	.080	.955	1.047
Household size	-.319	.293	-.044	-1.088	.277	.910	1.099

Notes: *a. Dependent variable: Yield in kg/acre*

5 Summary of Major Findings, Conclusions and Policy Implications

5.1 Summary of Major Findings

Globally, groundnut is an important annual legume. It is mainly grown for oilseed, food, and animal feed. Groundnut is the 13th most important food crop in the world. It is the world's 4th most important source of edible oil and 3rd most important source of vegetable protein. Despite its worldwide significance, its production fluctuates considerably.

This study surveyed the socio-economic factors that affect the level of groundnut production in Urambo district, Tabora region. Ostensibly, it set out to identify factors that contribute to the declining production of the crop over time. The major findings of the study are as follows.

- Purchase of land was the most common method of land acquisition among smallholder farmers in the study area.
- Very few women owned land compared with men.
- Most smallholder farmers own larger areas of land but only cultivate small areas that they can manage.
- Groundnut in Urambo district is produced mostly for household consumption.
- Groundnut in the study area is sold at low prices relative to tobacco and rice.
- Very few groundnut farmers process their production. Major factors mentioned for not processing groundnut include limited technology, customers' preference for unprocessed groundnut, shortage of capital to purchase necessary equipment and low market price for shelled groundnut which does not cover the cost of processing.
- Cost of seeds, cost of pesticides, hours spent farming, cultivated land size and the price of groundnut from the previous season all significantly influence groundnut production in the study area.
- Groundnut is the third most profitable crop in terms of gross profit margin after beans and rice. However, farmers reported limited extension services and availability of inputs as problems limiting production.

5.2 Conclusions

As groundnut production is deemed to be women's business, household heads, especially men, do not give this crop deserved weight and attention. This contributed to lower production. On the other hand, the study found gender disparity in land ownership. It was observed that more than three-quarters of males owned land compared with less than a fifth of their female counterparts.

Equally importantly, the study found that the cost of seeds, cost of pesticides, hours spent farming, cultivated land size and price of groundnut from the previous season, significantly predict variability in groundnut yield in the study area.

Of important note, land scarcity is not an issue in the study area. Season after season, most smallholder farmers cultivate less land than they have resulting into huge areas of idle land. The study also found that groundnut in Urambo is mostly produced crop on a small scale for household consumption. A small quantity is produced for commercial purposes, regardless of the short distance between farmers' homes and selling points. Generally, groundnut in the study area is sold

at a low price compared with tobacco and rice, which discourages farmers from producing more groundnut.

Groundnut is also processed on a small scale. Most of the farmers reported shelling as the main method they use to process their groundnut. Others reported grading as the main method of groundnut processing and value-addition. The main factors cited by respondents that limited groundnut processing were inadequate knowledge to operate decorticating (shelling) machines, limited access to technology, customers' preference for unprocessed groundnut, shortage of capital to purchase processing equipment and low market prices for shelled groundnut which does not cover cost of production.

Concerning profitability, groundnut is the third most profitable crop after beans and rice. Groundnut has lower input costs so farmers are urged to increase the area under cultivation to increase profit. However, extension services do not reach the majority of groundnut farmers in the study area. Several factors might explain this: i) lack of transportation; ii) poor incentives; iii) lack of specialized extension officers for different crops; and iv) shortage of extension officers. Resolving these obstacles will enable more farmers to access extension services.

5.3 Policy Implications

Poverty alleviation remains the highest priority for government policy in Tanzania today. The government recognizes that to alleviate poverty in the country agriculture must be transformed from the current subsistence smallholder farming to large commercialized and highly mechanized agriculture. For that reason, the National Strategy for Growth and Reduction of Poverty (NSGRP) was established as a strategy to meet the Tanzania Development Vision 2025. Among other national goals, Vision 2025 aspires for Tanzania to be a country with a high quality livelihood and a competitive economy capable of producing sustainable growth and shared benefits. The NSGRP which is currently in its second phase has made some noticeable achievements on improving macro-economic indicators. However, this has been limited by the slow growth in agriculture which does not support the fast growth in other sectors such as the service sector and communication. It was in light of this slow growth in agriculture that the government established "*Kilimo Kwanza*" (Agriculture First).

Kilimo Kwanza is a national declaration to speed up agricultural transformation. It comprises a holistic set of policy instruments and strategic interventions towards addressing the various sectoral and cross-sectoral challenges, as well as taking advantage of the numerous opportunities to modernize and commercialize agriculture in the country. Its grand profile is clearly stipulated in the "*Kilimo Kwanza*" resolution by the Tanzania Agricultural Council (TAC).

The strategy is based on ten actionable pillars. This approach is intended to transform agriculture for the benefit of the majority of Tanzanians. Under *Kilimo Kwanza,* the definition of "agriculture" conforms to the FAO definition which includes crops, livestock, fisheries, forestry and bee-keeping. *Kilimo Kwanza* was formulated under the patronage of the Tanzania National Business Council (TNBC) and its implementation requires involvement of both public and private sectors.

However, the implementation of the strategy seems to have neglected vital aspects of smallholder farming, which includes groundnut farming in Tanzania. To boost production and contribute to improved incomes and livelihoods for groundnut farmers, this study recommends the following policy responses:

(a) Expand extension services to ensure that smallholder groundnut farmers have access to high-yielding groundnut seed varieties, agro-chemicals, and improved farm inputs, storage and marketing facilities.

(b) Establish gender sensitization campaigns targeting farmers including smallholder groundnut farmers. This will encourage farmers especially men to value groundnut cultivation as they value other crops such as tobacco and rice that contribute directly to household livelihoods through provision of food and income.

(c) Encourage formation of farmer managed co-operatives among smallholder groundnut growers. These may be in the form of co-operative banks, agricultural marketing co-operatives (AMCos) or savings and credit co-operative societies (SACCOS). Co-operatives will assist in production, collection, storage, marketing and processing of produce. Furthermore, SACCOS can assist in providing soft loans purposively aimed at meeting the costs of inputs such as seeds and pesticides with affordable interest rates to smallholder farmers.

(d) Encourage groundnut farmers to increase land under cultivation. Smallholder farmers own relatively large pieces of land but cultivate only small portions. Since groundnut is among the most profitable crops, smallholder farmers need to be assisted to expand the area under cultivation. This may help transform the current farming system from smallholder farming to larger scale.

(e) Discourage farm gate prices by establishing selling points which also offer value addition and storage facilities. These efforts will likely act to increase the prices received by farmers for groundnut produced.

(f) Conduct research to establish reasons as to why the majority of people in Urambo district do not complete seven years of primary schooling.

Appendix

Sample size determination

A: Based on a sample size formula by Fisher et al. (1991) as described hereunder:

When population is greater than 10,000

Sample size n of a population P is given by: n = $\frac{Z^2 Pq}{d^2}$
Where,
Z = Standard normal deviation set at 1.96 (or 2.0) corresponding to 95% confidence level
P= Percentage of target population estimated to have particular characteristics if not known use 50%
q= 1.0-P
d=Degree of accuracy desired set at 0.05 or 0.02

Given:
P= Percentage of (groundnut and non-groundnut farmers) (not known), we use 50%.
Z= 2.0
q=1.0-0.5
d=0.05

The sample size for the study is given by: $\frac{2^2 x0.05x0.05}{0.05^2}$ = 400 Farmers

B: Proportionate sampling

Using a formula: $n = \frac{p_1}{p_2} xN$
Where,
N = Total sample 400
n = Expected sub-sample
P1 = Estimated population of the village
P2 = Total households of all 14 sampled villages (1,592 H/Holds)

The following sub-samples were calculated:

S/No.	Village	Households	Sample	Percentage
1	Kalemela B	180	47	12
2	Muungano	120	30	7
3	Mabundulu	68	17	4
4	Songambele	168	42	10
5	Uhuru	72	18	6
6	Usisya Kati	80	20	5
7	Usoke	52	13	3
8	Usongelani	116	29	7
9	Itegamatwi	80	20	5
10	Sipungu	76	19	5
11	Vumilia	108	27	7
12	Katunguru	124	31	7
13	Kalemela A	128	32	8
14	Jionee mwenyewe	220	55	14
Total		**1592**	**400**	**100**

References

Abalu, G. O. I., & Etuk, E. G. (1986). Traditional versus improved groundnut production practices: Some further evidences from Northern Nigeria. *Experimental Agriculture, 22*(1), 33-38.

Adinya, I. B., Enun, E. E., & Ijoma, J. U. (2010). Exploring profitability potentials in groundnut (*Arachis Hypogaea*) production through agroforestry practices: A case study in Nigeria. *Journal of Animal and Plant Sciences, 20*(2),123-131.

Aburajab-Tamimi, T, & Alqouqa, I. (2009). Gross margin and cost benefit analysis of rain-water harvesting techniques used in olive groves using in South of Hebron Governorate. *Hebron University Research Journal, 4*(1), 67-79.

Akobundu, E. (1998). *Farm-household analysis of policies affecting groundnut production in Senegal.* Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University in partial fulfilment of the requirements for the degree of Master of Science in Agricultural and Applied Economics, Virginia.

Amin, M. E. (2005). *Social science research conception, methodology and analysis*. Kampala, Uganda: Makerere University Printery.

Anwar, S. (1980). Laws of production and laws of algebra—Humbug II. In E.J. Nell (Ed.), *Growth, profits and property*. Cambridge: Cambridge University Press.

Appleton, S., & Balihuta, A. (1996) Education and agricultural productivity: Evidence from Uganda. *Journal of International Development, 8*(3), 415-444.

Atanasi, M. (2007). *Evaluation of the Association of Tanzania Tobacco Traders' Reforestation Programme: The case of Urambo District*. A dissertation submitted in partial fulfilment of the requirements for the award of the degree of Master of Arts in Rural Development, Sokoine University of Agriculture, Morogoro, Tanzania.

Babbie, E. (1990). *Survey research methods* (2nd ed.). Belmont, California: Wadworth Publishing Co.

Beuro for Agriculture Consultancy and Advisory Service (BACAS). (2000). *Baseline survey on the Agriculture Research System under the Department of Research and Training, Volume I. Western Zone. Synthesis of Main Findings and Recommendations (Final report).* Morogoro, Tanzania: Sokoine University of Agriculture.

Bank of Tanzania (BoT) 2009. *Publications and Statistics*. Retrieved from www.bot-tz.org/ publications/ publcationsandstatistics.asp [Site visited 22/7/2012].

Belsley, D. A., Kuh, E., & Welsch, R. E.(1980). *Regression diagnostics: Identifying influential data and sources of collinearity.* New York: John Wiley.

Brookfield, H. (1972). Intensification and dis-intensification in Pacific agriculture. *Pacific Viewpoint, 13*, 30-41.

Bucheyeki, T. L., Shenkalwa, M. E, Mapunda, T., & Matata, W. L. (2008). On-farm evaluation of promising groundnut varieties for adaptation and adoption in Tanzania. *African Journal of Agricultural Research, 3*(8), 531-536.

Bucheyeki, T. L., Shenkalwa, M. E, Mapunda, T., & Matata, W. L. (2010). The groundnut client oriented research in Tabora, Tanzania. *African Journal of Agricultural Research, 5*(5), 356-362.

Caliskan S., Caliskan, M. E., Arslan, M., & Arioglu, H. (2008). Effects of sowing date and growth duration on growth and yield of groundnut in a Mediterranean-type environment in Turkey. *Field Crops Research, 105*(1-2), 131-140.

Chachage, C. (2010). *Land acquisition and accumulation in Tanzania: The case of Morogoro, Iringa and Pwani regions*. Morogoro: Pelum Tanzania.

Chirwa, E. W. (2002). *Microfinance and poverty reduction in Malawi: What happened to the microfinance revolution?* Wadonda Consult Working Paper WC/01/02. University of Malawi, Chancellor College.

Cotula, L. (2011). *Land deals in Africa: What is in the contracts?* Retrieved from http://pubs.iied. org/ pdfs/12568IIED.pdf [Site visited 26/7/2012].

Cypher, J. M., & Dietz, C. J. (2004). *The process of economic development* (2nd ed.). Padstow, Cornwall: T.J. International Ltd.

Diagne, A., & Zeller, M. (2001). *Access to credit and its impact on welfare in Malawi.* Research report No. 116, IFPRI, Washington D.C.

Doss, C. R. (1999). *Twenty-five years of research on women farmers in Africa: Lessons and implications for agricultural research institutions with an annotated bibliography*.

CIMMYT Economics Program Paper No. 99-02. Mexico D.F.: CIMMYT.

Driscoll, D. L., & Brizee, A. (2012). *Ethical considerations in primary research*. Retrieved from http://owl.english.purdue.edu/owl/resource/559/02/ [Site visited 28/09/2012].

DSA-TWG. (2005). *Growing out of poverty: A plain language guide to Tanzania's National Strategy for Growth and Reduction of Poverty*. Dar es Salaam: Hakikazi.

Eder, J. F. (1991). Agricultural intensification and labour productivity in a Philippine vegetable garden community: A longitudinal study. *Human Organization, 50*, 245-55.

Ellis R. H. (1998). Longevity of seeds stored hermetically at low moisture contents. *Seed Science Research, 8(*Suppl. No.1), 9-10.

Ellis, F. (1992). *Research economics*. Cambridge, U.K.: Cambridge University Press.

Eicher, C. K., & Staatz, J. M. (1998). *International agricultural development* (3rd ed.). Baltimore, Maryland: Hopkins University Press.

Emerging Markets Group Ltd. (2008). *Stabilization-driven value chain analysis of rice, groundnut and maize in Northern Uganda*. Retrieved from www.pazienti.net/answers [Site visited 26/7/2012]

Evenson, R. E. and Mwabu, G. (1997). *The effects of agricultural extension on farm yields in Kenya.* A paper originally presented at the 10th Anniversary Conference on Investment, Growth and Risk in Africa at the Centre for the Study of African Economies, University of Oxford, Oxford, UK, 17-18 April 1997.

FAO. (2010). *Gender and land rights: Understanding complexities; adjusting policies*. Economic and Social Development Department. Retrieved from http://www.fao.org/economic/es-policybriefs/briefs-detail/en/?no_cache=1&uid=40497 [Site visited 26/7/2012].

FAO. (2006). *FAO Production Yearbook, Volume 60*. Rome, Italy: FAO.

FAOSTAT. (2011). FAO Statistics Division 2013. Retrieved from http://faostat.fao.org/site/567/DesktopDefault.aspx?PageID=567#ancor [Site visited on 27/01/2013].

Farrar, D. E. and Glauber, R. R. (1967). Multicollinearity in regression analysis: The problem revisited. *The Review of Economics and Statistics, 49*(1), 92-107.

Fisher, A. A., Laing, J. E., & Townsend, J. W. (1991). *Handbook for family operation research and design* (2nd ed.) Population Council, USA, pp 43-46.

Gbèhounou, G., & Adango, E. (2003). Trap crops of Striga hermonthica: In vitro identification and effectiveness in situ. *Crop Protection, 22*(2), 395-404.

Gapasin, D., Cherry, J., Gilbert, J., Gibbons, R., Hildebrand,G., Nelson, D., Valentine, H., & Williamson, H. (2005). *The Peanut Collaborative Research Support Program (CRSP) 2005 External Evaluation Report*. Retrieved from http://www.oecd.org/dataoecd/ 57/63/36079702.pdf [Site visited on 26/7/2012].

Gerring, J. (2007). *Case study research, principles and practices*. New York: Cambridge University Press.

Hamidu, B. M., Kuli, S. G., & Mohammed, I. (2007). Profitability analysis of groundnut (Arachis hypogae L.) – Processing among women entrepreneurs in Bauchi Metropolis. *Management Network Journal, 3*(6), 389-395.

Hayami, Y. (2001). *Development economics: From the poverty to the wealth of nations* (2nd ed.). Oxford: Oxford University Press.

Hay, M., & Stichter, S. (1984*). African women south of the Sahara*. London: Longman.

Hair Jr, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). New Jersey: Pearson Education.

Heathfield, D. F. (1971). *Production functions, Macmillan studies in economics*. New York: Macmillan Press.

Hollar, D. L. (2010). *The predictive ability of thwarted belongingness and perceived burdensomeness versus culture-specific indicators of suicidality*. A dissertation submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy, Florida State University, Florida, USA.

Hong, N. X., Mehan, V. K., Ly, N. T., & Vinh, M. T. (1994). Status of groundnut bacterial wilt research in Vietnam. In V. K. Mehan & D. McDonald (Eds.).

Groundnut Bacterial Wilt in Asia - Proceedings of the third working group meeting (pp. 135-141). Oil Crops Research Institute, Wuhan, China. International Crops Research Institute for the Semi-Arid Tropics, Patacheru, A.P., India.

Hunt, D. (1991). Farm system and household economy as frameworks for prioritizing and appraising technical research: A critical appraisal of current approaches. In D. H. M. Haswell (Ed.), *Rural households in emerging societies: Technology and change in Sub- Saharan Africa*. Oxford: Berg.

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). (2012). *Groundnut (Arachis hypogaea L.)*. Retrieved from http://www.icrisat.org/crop-groundnut.htm [Site visited on 13/12/2012].

ICRISAT. (2009). *Groundnut*. Retrieved from http://www.icrisat.org/groundnut/Groundnut.htm [Site visited 17/7/2011].

Ihucha, A. (2011). Without land rights women are 'second class citizens'. *Arusha Times Online*. Retrieved from http://www.arushatimes.co.tz/2011/13/front_page_2.htm [Site visited 2/10/12].

Index mund (2010). *Tanzania median age*. Retrieved from http://www.indexmundi.com /Tanzania/median_age.html [Site visited 1/10/12].

Index mund (2012). *Tanzania Economy Profile 2012*. Retrieved from http://www.indexmundi.com/tanzania/ economy_profile.html [Site visited on 21/7/2012].

International Trade Centre (ITC) (2011). Exporting Groundnut. *International Trade Forum Magazine*. Retrieved from http://www.tradeforum.org/news/fullstory.php/aid/135/Exporting_Groundnut.html [Site visited on 10/7/2012].

Kafiriti , E. M. (1990). Groundnut agronomy in Tanzania: The importance of timely harvesting of groundnut. In *Proceedings of the Fourth Regional Groundnut Workshop for Southern Africa, Arusha, Tanzania, 1990* (pp. 189-193). International Crops Research Institute for the Semi-Arid Tropics, India.

Keenja, C. N (2004). *Agriculture as the backbone of the economy of Tanzania*. A paper presented at the Convocation General Meeting of the Open University of Tanzania by the Minister of Agriculture and Food Security. Retrieved from www.agriculture.go.tz/.../ CONVOCATION %20UNIVERSITY%20OCTOBER%202004%20MNGOD... [Site visited 26/7/2012].

Kenny, A. & Finn, K. (2004). *Groundnut (Arachis hypogaea), women and development: Impact on nutrition and women's roles in Western Africa*. Retrieved from http://forest.mtu.edu/pcforestry/Resources/studentprojects/groundnut.html [Site visited on 16/7/09].

Key, N., Sadoulet, E., & de Janvry, A. (2000). Transactions costs and agricultural household supply response. *American Journal of Agricultural Economics, 82*(2), 245-259.

Kikwete, J. M. (2011). *Foreword: Kilimo-Kwanza in motion*. Southern Agricultural Growth Corridor of Tanzania (SAGCOT). Retrieved from http://www.agdevco.com/sysimages/foreword_final .pdf [Site visited 27/7/2012].

Kimmins, F. M., Deom, C. M., Subrahmanyam, P., Chiyembekeza, M., & van der Merwe P. J. A. (1999). *Groundnut Rossete: A virus affecting groundnut production in Sub-Saharan Africa.* The American Phatophalogical Society.

LRRRI . (2011). *Accumulation by land dispossession and labour devaluation in Tanzania: The case of biofuel and forest investments in Kilwa and Kilolo*. Dar es Salaam: Hakiardhi, Ecoprint Ltd.

Lugoe, N. F. (2008). *A century of government regulated land access in Tanzania*. Paper for the video-conferencing workshop on land administration in Africa (Searching for Alternative Approaches), 12-15 May 2008. Available online at www.dilaps.or.tz.

Luoto, J., & Rafert, G. (2009). *Two models of economic growth.* Retrieved from http://are.berkeley.edu/~rafert/docs/Two_Models_of_Econ_Growth.pdf [Site visited on 7/8/2009].

Makhura, M. T. (2001). *Overcoming transaction costs barriers to market participation of smallholder farmers in the Northern Province of South Africa*. A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy, University of Pretoria, South Africa.

Mbote, P. K. (2010). *Gender issues in land tenure under customary law*. Environmental Law Research Center, University of Nairobi.

Mendola, M. (2007). Farm household production theories: A review of "institutional" and "behavioral"

responses. *Asian Development Review, 24*(1), 49-68.

Ministry of Education and Vocational Training [Tanzania]. *Basic Education Statistics in Tanzania (BEST), 2002-2010*.
Retrieved from www.openmicrodata.wordpress.com/2010/09/01/tanzania-administration-data-on-education-2002-2010 [Site visited 22/7/2012].

Minten, B. (1999). *Infrastructure, market access, and agricultural prices: evidence from Madagascar.* Market and structural studies division. International Food Policy Research Institute, Washington. Retrieved from http:// www. ifpri. org/ sites/ default /files/pubs/divs/mtid/ dp/papers/dp26.pdf [Site visited on 20/7/2012].

Mnenwa, R., & Maliti, E. (2010). *A comparative analysis of poverty incidences in farming systems of Tanzania.* Research on Poverty Alleviation (REPOA), Special Paper 10/4.

Mpawenimana, J. (2005). *Analysis of socio-economic factors affecting the production of bananas in Rwanda: A case study of Kanama District*. www. unipv. eu/site /en/home /international.../documento5709.html‟. [Site visited on 14/8/2012].

Mucavele, F. G. (2009). *True contribution of agriculture to economic growth and poverty reduction: Malawi, Mozambique and Zambia synthesis report*. Retrieved from http://www.fanrpan.org/documents/d01034/Synthesis%20Report%20True%20Contribution%20of%20Agriculture.pdf [Site visited on 26/7/2012].

Mugisha, J., Ogwal, R., Ekere, O. W., & Ekiyar, V. (2004). Adoption of IPM groundnut production technologies in Eastern Uganda. *African Crop Science Journal, 12*(4), 383-391.

Mwenda , F. F. (1985). Groundnut breeding and improvement programs in Tanzania. In *Proceedings of the Regional Groundnut Workshop for Southern Africa ,Lilongwe , Malawi , 1985* (pp. 81-87). International Crops Research Institute for the Semi-Arid Tropics, India.

Nautiyal, P. C. (2002). *Groundnut: Post-harvest operations*. Research Centre for Groundnut (ICAR). Retrieved from www.icar.org.in [Site visited 23/7/2012].

Nigam, S. N. and Lenné, J. M. (1996). Groundnut in ICRISAT Programmes*. Grain Legumes, 14*, 25-27.

Nduwamungu, J. (2001). *Dynamics of deforestation in Miombo woodlands: The case of Kilosa District, Tanzania*. A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy, Sokoine University of Agriculture, Morogoro, Tanzania.

Netting, R. M. (1993). *Smallholders, householders: Farm families and the ecology of intensive, sustainable agriculture*. Stanford, California: Stanford University Press.

Njuki, J. M. (2001). *Gender roles in agro-forestry: A socio-economic analysis of Embu and Kirinyaga Districts, Kenya*. A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy, Sokoine University of Agriculture, Morogoro, Tanzania.

Norton, R. D. (2004). *Agricultural development policy concepts and experiences*. West Susgender: John Wiley and Sons Ltd.

NPC (National Peanut Council of the United States). (1990). Peanut industry guide 1990-91. *The Peanut Farmer, 26*(8), 1-270.

Ntare, B. R., Diallo, A. T., Ndjeunga, J., & Waliyar, F. (2007). *Groundnut seed production manual.* ICRISAT. oar. icrisat. org/view /icrisatcreators/ Diallo=3AA_T =3A=3A. country.html‟. [Site visited on 20/3/2012].

Nwokolo, E. (1996). Peanut (Arachis hypogaea L.). In E. Nwokolo and J. Smartt (Eds.), *Food and feed from legumes and oilseeds* (pp. 49-63). New York: Chapman and Hall.

ODA (Overseas Development Administration). (1984). *Annual report no.13. Response of groundnut to the distribution of rainfall or irrigation*. University of Nottingham, Nottingham.

O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality and Quantity 41*(5), 673-690.

Onaiah, M. O., Enya, V. E., Agba, O. A., & Odey, S. O. (2007). Analysis of the effects of farm size, labour and capital resources on sweet potato output in the Central and Northern Senatorial Districts of Cross River State. *Journal of Agriculture, Forestry and the Social Sciences, 5*(1). Retrieved from http://www.ajol.info/index.php/joafss/article/ view/45946/0 [Site visited on 20/09/2012].

Oso, W. Y and Onen, D. (2008). *A general guide to writing research proposal and report. A handbook for beginning researchers* (2nd ed.). Kampala, Uganda: Makerere University Printery.

Pande, S., Bandyopadhyay, R., Blümmel, M., Narayana Rao, J., Thomas, D., & Navi, S. S. (2003). Disease management factors influencing yield and quality of sorghum and groundnut crop residues. *Field Crops Research, 84*(1-2), 89-103.

Pingali, P., Khwaja Y., & Meijer M. (2005). *Commercializing small farms: Reducing transaction costs.* ESA Working Paper No. 05-08.

Policy Forum. (2009). Website: www.policyforum.or.tz

Pompeu, A. S. (1980). Groundnut production, utilization, research problems and further research needs in Brazil. In *Proceedings of the International Workshop on Groundnut. ICRISAT Center, Patancheru, India, 13-17 October 1980* (pp. 244-246). International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, A.P., India.

Pound, B., & Phiri, A. (2010). *Longitudinal impact assessment study of groundnut producers in Malawi – Main report*. Natural Resources Institute, University of Greenwich. Retrieved from http://www.nri.org/news/documents/ft_groundnut_malawi_main_report_july2012.pdf [Site visited 19/12/2012].

Ramadhani, T., Otsyina, R., & Franzel, S. (2002). Improving household income and reducing deforestation using rotational woodlots in Tabora District, Tanzania. *Agriculture Ecosystem and Environment, 89* (3), 229-239.

Reddy, P. (2000). Global groundnut trade to slow down. *Businessline*. Internet edition. Retrieved from http://www.hinduonnet.com/businessline/2000/11/18/stories/071803e5.htm. [Site visited on 15/7/2009].

Ruttan, V. W. (2001). *Technology, growth and development: An induced innovation perspective*. New York and Oxford: Oxford University Press, Oxford.

Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research methods for business students* (4th ed.). Harlow: Prentice Hall.

Shephard, R. (1970). *Theory of cost and production functions*. Princeton NJ: Princeton University Press.

Sibuga, K. P., Kafiriti, E. M., & Mwenda, F. F. (1992). A review of groundnut agronomy in Tanzania: Current status and existing gaps. In *Proceedings of the Fifth Regional Groundnut Workshop for Southern Africa, Lilongwe, Malawi, 1992* (pp. 47-52). ICRISAT.

Simtowe, F., Shiferaw, B., Asfaw, S., Tsedeke, A., Monyo, E., Siambi, M., & Muricho, G. (2009). *Socioeconomic assessment of baseline pigeonpea and groundnut production conditions, farmer technology choice, market linkages, institutions and poverty in rural Malawi*. ICRISAT, Lilongwe. Retrieved from www.icrisat.org/what-we-do/impi/projects/tl2.../rr-pp-gn-malawi.pdf [Site visited on 24/ 7/ 2012].

Singh, A., Vasishtb, A. K., Kumara, R., & Dasc, D. K. (2008). Adoption of integrated pest management practices in paddy and cotton : A case study in Haryana and Punjab. *Agricultural Economics Research Review , 21,* 221-226.

Six, M. J. (2006). *European economic forecast: One currency, two growth models*. Global Fixed Income Research, London. Retrieved from http://www2.standardandpoors.com/spf/pdf/fixedincome/03-02-06_EurEconForecst_OneCurrency.pdf [Site visited on 10/8/2009].

Smith, A.F. (2002). *Peanuts: The illustrious history of the goober pea*. Chicago: University of Illinois Press.

Smith, D. (2010). *Midterm report: Tanzania's educational revolution needs investment*. Retrieved from http: //www.guardian.co.uk/global-development/2010/sep/14/mdg2-educationtanzania.

Smith, G. (2002). *Marriage tradition in Africa: Lobola*. Retrieved from http://www.essortment. com/all/africanmarriag_rntr.htm.

Sorrensen, R., Butts, C., Lamb, M., & Rowland, D. (2004).Five years of subsurface drip irrigation on Peanut. *UGA/CPES Research and Extension Bulletin,* No. 2004.

Szirmai, A. (2005). *The dynamics of socio-economic development: An introduction*. Cambridge. U.K.: Press syndicate of the University of Cambridge.

Sudman, S. (1976). *Applied sampling*. New York: Academic Press.

Tanzania Agricultural Council (TAC). www.actanzania.org [Site visited on 18/04/2010].

Taru,V. B., Kyagya, I. Z., Mshelia, S. I., & Adebayo, E. F. (2008). Economic efficiency of resource use in groundnut production in Adamawa State of Nigeria. *World Journal of Agricultural Sciences, 4*(S), 896-900.

Taru, V. B., Kyagya, I. Z., & Mshelia, S. I. (2010). Profitability of groundnut production in Michika Local Government Area of Adamawa State, Nigeria. *Journal of Agricultural Science, 1*(1), 25-29.

Taylor, J. E., & Adelman, I. (2003). Agricultural household models: Genesis evolution and extensions. *Review of Economics of the Household, 1*(1), 33-58.

Turner II, B. L., & Brush, S. B. (Eds.) (1987). *Comparative farming systems*. New York: Guilford Press.

Turner II, B. L., Hanham, R., & Portararo, A. (1977). Population pressure and agricultural intensity. *Annals of the Association of American Geographers, 67*, 384-96.

United Republic of Tanzania (URT). (1997). *Agricultural and livestock policy*. Dar es Salaam: Ministry of Agriculture and Cooperatives.

URT. (1998). *Tabora region socio-economic profile*. Joint publication by the Planning Commission Dar es Salaam and the Regional Commissioner's Office, Tabora. Retrieved from http://www.tzonline.org/pdf/Tabora.pdf [Site visited on 11/12/12].

URT. (2001). *Household baseline survey*. Dar es Salaam: Government Printer.

URT. (2003). *2002 Population and housing census*. Retrieved from http://www.tanzaniaonline. org/census [Site visited on 12/7/2007].

URT. (2005). *National strategy for growth and reduction of poverty (NSGRP*). Dar es Salaam Vice President's Office.

URT. (2009). *Poverty and human development report 2009*. Ministry of Finance and Economic Affairs. Dar es Salaam: Mkuki na Nyota Publishers.

URT. (2010a). *Tanzania gender indicators booklet.* Ministry of Finance and Economic Affairs, Poverty Eradication and Economic Empowerment Division. Dar es Salaam: REPOA.

URT. (2010b). *Tanzania investment guide*. Dar es Salaam: The Tanzania Investment Centre (TIC).

URT. (2010c). *National strategy for growth and reduction of poverty II (NGSRP II).* Dar es Salaam: Ministry of Finance and Economic Affairs.

UN Millennium Development Goals. (2000). Retrieved from http://www.un.org/millenniumgoals/poverty.shtml [Site visited on 4/7/2012].

Upadhyaya, H. D., Reddy, L. J., Gowda, C. L. L., & Singh, S. (2006). Identification of diverse groundnut germplasm: Sources of early maturity in a core collection. *Field Crops Research, 97*(2-3), 261-271.

Wabbi J. B. (2002). *Assessing factors affecting adoption of agricultural technologies: The case of integrated pest management (IPM) in Kumi District, Eastern Uganda*. Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of Master of Science in Agricultural and Applied Economics, Blacksburg, Virginia.

Weir, S. (1999).*The effects of education on farmer productivity in Rural Ethiopia*. Centre for the Study of African Economies, Department of Economics, University of Oxford. Oxford. Retrieved from http://www.csae.ox.ac.uk/workingpapers/pdfs/9907text.PDF [Site visited on 10/06/2012].

Weiss, E.A. (2000). *Oilseed crops*. London: Blackwell Science.

Wikipedia. *Growth.* Retrieved from http://en.wikipedia. org/ wiki/Growth [Site visited on 5/8/ 2009].

Wood, A. (1950). *The groundnut affair*. London: Bodley Head. Retrieved from Online Computer Library Center, Inc. (OCLC) 1841364 at http://www.oclc.org/us/en/about/default.htm on 12/12/2011.

Wooldridge, J. M. (2001). *Econometric analysis of cross section and panel data*. Cambridge, Massachusetts: MIT Press Ltd.

World Bank. (2001). *Smallholder irrigation market initiative study on the dissemination potential of affordable drip and other irrigation systems and the concrete strategies for their promotion*. Retrieved from http://www.world bank.org/small holder.

Publications by REPOA

Books

"Researching Poverty in Tanzania: problems, policies and perspectives"
Edited by Idris Kikula, Jonas Kipokola, Issa Shivji, Joseph Semboja and Ben Tarimo

"Local Perspectives on Globalisation: The African Case"
Edited by Joseph Semboja, Juma Mwapachu and Eduard Jansen

"Poverty Alleviation in Tanzania: Recent Research Issues" Edited by M.S.D. Bagachwa

Research Reports

14/2 *Structural Barriers, Constraints, and Urban Youth Employment: The Case of Ilala Municipality, Dar-es-Salaam*
Christopher S. Awinia

14/1 *Socio-Economic Factors Limiting Smallholder Groundnut Production in Tabora Region*
Mangasini A. Katundu, Mwanahawa L. Mhina, Arbogast G. Mbeiyererwa and Neema P. Kumburu

13/1 *Factors Influencing the Adoption of Conservation Agriculture by Smallholders Farmersin Karatu and Kongwa District of Tanzania*
Simon Lugandu

12/4 *Factors Affecting Participation in a Civil Society Network (Nangonet) in Ngara District*
Raphael N.L. Mome

12/3 *"The Instrumental versus the Symbolic: Investigating Members' Participation in Civil Society Networks in Tanzania"*
Kenny Manara

12/2 *"The Effect of Boards on the Performance of Microfinance Institutions: Evidence from Tanzania and Kenya"*
By Neema Mori and Donath Olomi

12/1 *'The Growth of Micro and Small, Cluster Based Furniture Manufacturing Firms and their Implications for Poverty Reduction in Tanzania'*
Edwin Paul Maede

11/2 *'Affordability and Expenditure Patterns for Electricity and Kerosene in Urban Households in Tanzania'*
Emmanuel Maliti and Raymond Mnenwa

11/1 *"Creating Space for Child Participation in Local Governmence in Tanzania: Save the Children and Children's Councils*
Meda Couzens and Koshuma Mtengeti

10/5 *"Widowhood and Vulnerability to HIV and AIDS-related Shocks: Exploring Resilience Avenues"*
Flora Kessy, Iddy Mayumana and Yoswe Msongwe

10/4 *"Determinants of Rural Income in Tanzania: An Empirical Approach"*
Jehovaness Aikaeli

10/3 *"Poverty and the Rights of Children at Household Level: Findings from Same and Kisarawe Districts, Tanzania"*
Ophelia Mascarenhas and Huruma Sigalla

10/2 *"Children's Involvement in Small Business: Does if Build youth Entrepreneurship?"*
Raymond Mnenwa and Emmanuel Maliti

10/1 *"Coping Strategies Used by Street Children in the Event of Illness"*
Zena Amury and Aneth Komba

08.6 *"Assessing the Institutional Framework for Promoting the Growth of MSEs in Tanzania; The Case of Dar es Salaam"*
Raymond Mnenwa and Emmanuel Maliti

08.5 *"Negotiating Safe Sex among Young Women: the Fight against HIV/AIDS in Tanzania"*
John R.M. Philemon and Severine S.A. Kessy

08.4 *"Establishing Indicators for Urban Poverty-Environment Interaction in Tanzania: The Case of Bonde la Mpunga, Kinondoni, Dar es Salaam"*
Matern A.M. Victor, Albinus M.P. Makalle and Neema Ngware

08.3 *"Bamboo Trade and Poverty Alleviation in Ileje District, Tanzania"*
Milline Jethro Mbonile

08.2 *"The Role of Small Businesses in Poverty Alleviation: The Case of Dar es Salaam, Tanzania"*
Raymond Mnenwa and Emmanuel Maliti

08.1 *"Improving the Quality of Human Resources for Growth and Poverty Reduction: The Case of Primary Education in Tanzania"*
Amon V.Y. Mbelle

07.2 *"Financing Public Heath Care: Insurance, User Fees or Taxes? Welfare Comparisons in Tanzania"*
Deograsias P. Mushi

07.1 *"Rice Production in the Maswa District, Tanzania and its Contribution to Poverty Alleviation"*
Jerry A. Ngailo, Abiud L. Kaswamila and Catherine J. Senkoro

06.3 *"The Contribution of Microfinance Institutions to Poverty Reduction in Tanzania"*
Severine S.A. Kessy and Fratern M Urio
Publications by REPOA

06.2 *"The Role of Indigenous Knowledge in Combating Soil Infertility and Poverty in the Usambara Mountains, Tanzania"*
Juma M. Wickama and Stephen T. Mwihomeke

06.1 *"Assessing Market Distortions Affecting Poverty Reduction Efforts on Smallholder Tobacco Production in Tanzania"*
Dennis Rweyemamu and Monica Kimaro

05.1 *"Changes in the Upland Irrigation System and Implications for Rural Poverty Alleviation. A Case of the Ndiwa Irrigation System, Wes Usambara Mountains, Tanzania"*
Cosmas H. Sokoni and Tamilwai C. Shechambo

04.3 *"The Role of Traditional Irrigation Systems in Poverty Alleviation in Semi-Arid Areas: The Case of Chamazi in Lushoto District, Tanzania"*
Abiud L. Kaswamila and Baker M. Masuruli

04.2 *"Assessing the Relative Poverty of Clients and Non-clients of Non-bank Micro-finance Institutions. The case of the Dar es Salaam and Coast Regions"*
Hugh K. Fraser and Vivian Kazi

04.1 *"The Use of Sustainable Irrigation for Poverty Alleviation in Tanzania. The Case of Smallholder Irrigation Schemes in Igurusi, Mbarali District"*
Shadrack Mwakalila and Christine Noe

03.7 *"Poverty and Environment: Impact analysis of Sustainable Dar es Salaam Project on "Sustainable Livelihoods" of Urban Poor"*
M.A.M. Victor and A.M.P. Makalle

03.6 *"Access to Formal and Quasi-Formal Credit by Smallholder Farmers and Artisanal Fishermen: A Case of Zanzibar"*
Khalid Mohamed

03.5 *"Poverty and Changing Livelihoods of Migrant Maasai Pastoralists in Morogoro and Kilosa Districts"*
C. Mung'ong'o and D. Mwamfupe

03.4 *"The Role of Tourism in Poverty Alleviation in Tanzania"*
Nathanael Luvanga and Joseph Shitundu

03.3 *"Natural Resources Use Patterns and Poverty Alleviation Strategies in the Highlands and Lowlands of Karatu and Monduli Districts – A Study on Linkages and Environmental Implications"*
Pius Zebbe Yanda and Ndalahwa Faustin Madulu

03.2 *"Shortcomings of Linkages Between Environmental Conservation and Poverty Alleviation in Tanzania"*
Idris S. Kikula, E.Z. Mnzava and Claude Mung'ong'o

03.1 *"School Enrolment, Performance, Gender and Poverty (Access to Education) in Mainland Tanzania"*
A.V.Y. Mbelle and J. Katabaro

02.3 *"Poverty and Deforestation around the Gazetted Forests of the Coastal Belt of Tanzania"*
Godius Kahyarara, Wilfred Mbowe and Omari Kimweri

02.2 *"The Role of Privatisation in Providing the Urban Poor Access to Social Services: the Case of Solid Waste Collection Services in Dar es Salaam"* Suma Kaare

02.1 *"Economic Policy and Rural Poverty in Tanzania: A Survey of Three Regions"* Longinus Rutasitara

01.5 *"Demographic Factors, Household Composition, Employment and Household Welfare"* S.T. Mwisomba and B.H.R. Kiilu

01.4 *"Assessment of Village Level Sugar Processing Technology in Tanzania"* A.S. Chungu, C.Z.M. Kimambo and T.A.L. Bali

01.3 *"Poverty and Family Size Patterns: Comparison Across African Countries"* C. Lwechungura Kamuzora

01.2 *"The Role of Traditional Irrigation Systems (Vinyungu) in Alleviating Poverty in Iringa Rural District"* Tenge Mkavidanda and Abiud Kaswamila

01.1 *"Improving Farm Management Skills for Poverty Alleviation: The Case of Njombe District"* Aida Isinika and Ntengua Mdoe

00.5 *"Conservation and Poverty: The Case of Amani Nature Reserve"* George Jambiya and Hussein Sosovele

00.4 *"Poverty and Family Size in Tanzania: Multiple Responses to Population Pressure?"* C.L. Kamuzora and W. Mkanta

00.3 *"Survival and Accumulation Strategies at the Rural-Urban Interface: A Study of Ifakara Town, Tanzania"* Anthony Chamwali

00.2 *"Poverty, Environment and Livelihood along the Gradients of the Usambaras on Tanzania"* Adolfo Mascarenhas

00.1 *"Foreign Aid, Grassroots Participation and Poverty Alleviation in Tanzania:* The HESAWA Fiasco" S. Rugumamu

99.1 *"Credit Schemes and Women's Empowerment for Poverty Alleviation: The Case of Tanga Region, Tanzania"* I.A.M. Makombe, E.I. Temba and A.R.M. Kihombo

98.5 *"Youth Migration and Poverty Alleviation: A Case Study of Petty Traders (Wamachinga) in Dar es Salaam"* A.J. Liviga and R.D.K Mekacha

98.4 *"Labour Constraints, Population Dynamics and the AIDS Epidemic: The Case of Rural Bukoba District, Tanzania"* C.L. Kamuzora and S. Gwalema

98.3 *"The Use of Labour-Intensive Irrigation Technologies in Alleviating Poverty in Majengo, Mbeya Rural District"* J. Shitundu and N. Luvanga

98.2 *"Poverty and Diffusion of Technological Innovations to Rural Women: The Role of Entrepreneurship"* B.D. Diyamett, R.S. Mabala and R. Mandara

98.1 *"The Role of Informal and Semi-Formal Finance in Poverty Alleviation in Tanzania: Results of a Field Study in Two Regions"* A.K. Kashuliza, J.P. Hella, F.T. Magayane and Z.S.K. Mvena

97.3 *"Educational Background, Training and Their Influence on Female-Operated Informal Sector Enterprises"* J. O'Riordan. F. Swai and A. Rugumyamheto

97.2 *"The Impact of Technology on Poverty Alleviation: The Case of Artisanal Mining in Tanzania"* B W. Mutagwaba, R. Mwaipopo Ako and A. Mlaki

97.1 *"Poverty and the Environment: The Case of Informal Sandmining, Quarrying and Lime-Making Activities in Dar es Salaam, Tanzania"* George Jambiya, Kassim Kulindwa and Hussein Sosovele

Working Papers

14/2 *Silent Killer, Silent Health Care: A Case Study of the Need for Nurse-led Hypertension Management*
Celestina Fivawo

14/1 *The Invisibility of Wage Employment in Statistics on the Informal Economy in Africa: Causes and Consequences*
Matteo Rizzo and Marc Wuyts

13/4 *Payments and Quality of Ante-Natal Care in Two Rural Districts of Tanzania*
Paper 4 from the Ethics, Payments and Maternal Survival project.
Paula Tibandebage, Maureen Mackintosh, Tausi Kida, Joyce Ikingura and Cornel Jahari

13/3 *Payments for Maternal Care and Women's Experiences of Giving Birth: Evidence from Four Districts in Tanzania*
Paper 3 from the Ethics, Payments and Maternal Survival project.
Maureen Mackintosh, Tausi Kida, Paula Tibandebage, Joyce Ikingura and Cornel Jahari

13/2 *Understandings of Ethics in Maternal Health Care: an Exploration of Evidence From Four Districts in Tanzania*
Paper 2 from the Ethics, Payments, and Maternal Survival project
Paula Tibandebage, Tausi Kida, Maureen Mackintosh and Joyce Ikingura

13/1 *Empowering Nurses to Improve Maternal Health Outcomes*
Paper 1 from the Ethics, Payments, and Maternal Survival project
Paula Tibandebage, Tausi Kida, Maureen Mackintosh and Joyce Ikingura

Special Papers

13/1 *Understanding the Process of Economic Change: Technology and Opportunity in Rural Tanzania*
Maia Green

13/2 *Rewards for High Public Offices and the Quality of Governance in Sub-Saharan Africa*
Theodore R. Valentine

12/4 *Growth with Equity – High Economic Growth and Rapid Poverty Reduction: The Case of Vietnam*
Do Duc Dinh

12/3 *"Why Poverty remains high in Tanzania: And what to do about it?"*
Lars Osberg and Amarakoon Bandara1

12/2 *The Instrumental versus the Symbolic: Investigating Members' Participation in Civil Society Networks in Tanzania*
By Kenny Manara

12/1 *The Governance of the Capitation Grant in Primary Education in Tanzania: Why Civic Engagement and School Autonomy Matter*
By Kenny Manara and Stephen Mwombela

11/1 *"Tracer Study on two Repoa Training Courses: Budget Analysis and Public Expenditure Tracking System"*
Ophelia Mascarenhas

10/5 *"Social Protection of the Elderly in Tanzania: Current Status and Future Possibilities"*
Thadeus Mboghoina and Lars Osberg

10/4 *"A Comparative Analysis of Poverty Incidence in Farming Systems of Tanzania"*
Raymond Mnenwa and Emmanuel Maliti

10/3 *"The Tanzania Energy Sector: The Potential for Job Creation and Productivity Gains Through Expanded Electrification"*
Arthur Mwakapugi, Waheeda Samji and Sean Smith

10/2 *"Local Government Finances and Financial Management in Tanzania: Empirical Evidence of Trends 2000 - 2007'*
Reforms in Tanzania"
Odd-Helge Fjeldstad, Lucas Katera, Jamai sami and Erasto Ngalewa

10/1 *"The Impact of Local Government Reforms in Tanzania"*
Per Tidemand and Jamal Msami

09.32 *"Energy Sector: Supply and Demand for Labour in Mtwara Region"*
Waheeda Samji, K.Nsa-Kaisi and Alana Albee

09.31 *"Institutional Analysis of Nutrition in Tanzania"*
Valerie Leach and Blandina Kilama

09.30 *"Influencing Policy for Children in Tanzania: Lessons from Education, Legislation and Social Protection"*
Masuma Mamdani, Rakesh Rajani and Valerie Leach with Zubeida Tumbo-Masabo and Francis Omondi

09.29 *"Maybe We Should Pay Tax After All? Citizens' Views of Taxation in Tanzania"*
Odd-Helge Fjeldstad, Lucas Katera and Erasto Ngalewa

09.28 *"Outsourcing Revenue Collection to Private Agents: Experiences from Local Authorities in Tanzania"*
Odd-Helge Fjeldstad, Lucas Katera and Erasto Ngalewa

08.27 *"The Growth – Poverty Nexus in Tanzania: From a Developmental Perspective"*
Marc Wuyts

08.26 *"Local Autonomy and Citizen Participation In Tanzania - From a Local Government Reform Perspective."*
Amon Chaligha

07.25 *"Children and Vulnerability In Tanzania: A Brief Synthesis"*
Valerie Leach

07.24 *"Common Mistakes and Problems in Research Proposal Writing: An Assessment of Proposals for Research Grants Submitted to Research on Poverty Alleviation REPOA (Tanzania)."*
Idris S. Kikula and Martha A. S. Qorro

07.23 *"Guidelines on Preparing Concept Notes and Proposals for Research on Pro-Poor Growth and Poverty in Tanzania"*

07.22 *"Local Governance in Tanzania: Observations From Six Councils 2002-2003"*
Amon Chaligha, Florida Henjewele, Ambrose Kessy and Geoffrey Mwambe

07.21 *"Tanzanian Non-Governmental Organisations – Their Perceptions of Their Relationship with the Government of Tanzania and Donors, and Their Role and Impact on Poverty Reduction and Development"*

06.20 *"Service Delivery in Tanzania: Findings from Six Councils 2002-2003"*
Einar Braathen and Geoffrey Mwambe

06.19 *"Developing Social Protection in Tanzania Within a Context of Generalised Insecurity"*
Marc Wuyts

06.18 *"To Pay or Not to Pay? Citizens' Views on Taxation by Local Authorities in Tanzania"*
Odd-Helge Fjeldstad

17 *"When Bottom-Up Meets Top-Down: The Limits of Local Participation in Local Government Planning in Tanzania"*
Brian Cooksey and Idris Kikula

16 *"Local Government Finances and Financial Management in Tanzania: Observations from Six Councils 2002 – 2003"*
Odd-Helge Fjeldstad, Florida Henjewele, Geoffrey Mwambe, Erasto Ngalewa and Knut Nygaard

15 *"Poverty Research in Tanzania: Guidelines for Preparing Research Proposals"*
Brian Cooksey and Servacius Likwelile

14 *"Guidelines for Monitoring and Evaluation of REPOA Activities"*
A. Chungu and S. Muller-Maige

13 *"Capacity Building for Research"*
M.S.D. Bagachwa

12 *"Some Practical Research Guidelines"*
Brian Cooksey and Alfred Lokuji

11 *"A Bibliography on Poverty in Tanzania"*
B. Mutagwaba

10 *"An Inventory of Potential Researchers and Institutions of Relevance to Research on Poverty in Tanzania"*
A.F. Lwaitama

9 *"Guidelines for Preparing and Assessing REPOA Research Proposals"*
REPOA Secretariat and Brian Cooksey

8 *"Social and Cultural Factors Influencing Poverty in Tanzania"*
C.K. Omari

7 *"Gender and Poverty Alleviation in Tanzania: Issues from and for Research"*
Patricia Mbughuni

6 *"The Use of Technology in Alleviating Poverty in Tanzania"*
A.S. Chungu and G.R.R. Mandara

5 *"Environmental Issues and Poverty Alleviation in Tanzania"*
Adolfo Mascarenhas

4 *"Implications of Public Policies on Poverty and Poverty Alleviation: The Case of Tanzania"*
Fidelis Mtatifikolo

3 *"Who's Poor in Tanzania? A Review of Recent Poverty Research"*
Brian Cooksey

2 *"Poverty Assessment in Tanzania: Theoretical, Conceptual and Methodological Issues"*
J. Semboja

1 *"Changing Perceptions of Poverty and the Emerging Research Issues"*
M.S.D. Bagachwa

Project Briefs

Brief 40 *National Agriculture Input Voucher Scheme(NAIVS 2009 - 2012), Tanzania:Opportunities for Improvement*
Kriti Malhotra

Brief 39 *Examining the Institutional Framework for Investment in Tanzania: A perspective from the Executive Opinion Survey, 2012-13*
Johansein Rutaihwa

Brief 38 *"Achieving High Economic Growth with Rapid Poverty Reduction: The Case of Vietnam"*
Do Duc Dinh

Brief 37 *"Social-Economic Transformation for Poverty Reduction: Eight Key Messages for Unlocking Tanzania's Potential"*
Philip Mpango

Brief 36 *"Tracer Study for Research Users: The case of TGN Media Training"*
Ophelia Mascarenhas

Brief 35 Understanding Rural Transformation in Tanzania

Brief 34 Affordability and Expenditure Patterns for Electricity and Kerosene in Urban Households in Tanzania

Brief 33 Biofuel Investment in Tanzania: Awareness and Participation of the Local Communities

Brief 32 Supporting Tanzania's Cocoa Farmers

Brief 31 The Instrumental versus the Symbolic: Investigating Members' Participation in Civil Society Networks in Tanzania

Brief 30 Competitiveness of Tanzanian Coffee Growers amid Bifurcated Coffee Markets

Brief 29 Using Annual Performance Reports to Manage Public Resources in Tanzania

Brief 28 Growth of Micro and Small, Cluster-Based Furniture-Manufacturing Firms and their Implications for Poverty Reduction in Tanzania

Brief 27 Creating Space for Child Participation in Local Governance in Tanzania: Save the Children and Children's Councils

Brief 26 Tracer Study on REPOA Training Courses for Research Users: Budget Analysis and Public Expenditure Tracking System

Brief 25 Transparency in Local Finances in Tanzania.
2003-2009

Brief 24 Social Protection of the Elderly in Tanzania: Current Status and Future Possibilities

Brief 23 Children's Involvement in Small Business: Does it Build Youth Entrepreneurship?

Brief 22 Challenges in data collection, consolidation and reporting for local government authorities in Tanzania

Brief 21 Children's Involvement in Small Business: Does it Build Youth Entrepreneurship?

Brief 20 Widowhood and Vulnerability to HIV and AIDS Related Shocks: Exploring Resilience Avenues

Brief 19 Energy, Jobs and Skills: A Rapid Assessment in Mtwara, Tanzania

Brief 18 Planning in Local Government Authorities in Tanzania: Bottom-up Meets Top-down

Brief 17 The Investment Climate in Tanzania: Views of Business Executives

Brief 16 Assessing the Institutional Framework for Promoting the Growth of Micro and Small Enterprises (MSEs) in Tanzania: The Case of Dar es Salaam

Brief 15 Preventing Malnutrition in Tanzania: A Focused Strategy to Improve Nutrition in Young Children

Brief 14 Influencing Policy for Children in Tanzania: Lessons from Education, Legislation and Social Protection

Brief 13 Disparities Exist in Citizens' Perceptions of Service Delivery by Local Government Authorities in Tanzania

Brief 12 Changes in Citizens' Perceptions of the Local Taxation System in Tanzania

Brief 11 Citizens Demand Tougher Action on Corruption in Tanzania

Brief 10 Outsourcing Revenue Collection: Experiences from Local Government Authorities in Tanzania

Brief 9 Children and Vulnerability in Tanzania: A Brief Overview

Brief 8 Mawazo ya AZISE za Tanzania Kuhusu Uhusiano Wao na Wafadhili

Brief 7 Mawazo ya AZISE za Tanzania Kuhusu Uhusiano Wao na Serikali

Brief 6 Local Government Reform in Tanzania 2002 - 2005: Summary of Research Findings on Governance, Finance and Service Delivery

Brief 5 Children Participating in Research

Brief 4 Changes in Household Non-Income Welfare Indicators - Can poverty mapping be used to predict a change in per capita consumption over time?

Brief 3 Participatory Approaches to Local Government Planning in Tanzania, the Limits to Local Participation

Brief 2 Improving Transparency of Financial Affairs at the Local Government Level in Tanzania

Brief 1 Governance Indicators on the Tanzania Governance Noticeboard Website TGN1 What is the Tanzania Governance Noticeboard?

LGR 12 Trust in Public Finance: Citizens' Views on taxation by Local Authorities in Tanzania

LGR 11 Domestic Water Supply: The Need for a Big Push

LGR10 Is the community health fund better than user fees for financing public health care?

LGR 9 Are fees the major barrier to accessing public health care?

LGR 8 Primary education since the introduction of the Primary Education Development Plan

LGR 7 Citizens' access to information on local government finances

LGR 6 Low awareness amongst citizens of local government reforms

LGR 5 Fees at the dispensary level: Is universal access being compromised?

LGR 4 TASAF – a support or an obstacle to local government reform

LGR 3 Councillors and community leaders – partnership or conflict of interest? Lessons from the Sustainable Mwanza Project

LGR 2 New challenges for local government revenue enhancement

LGR 1 About the Local Government Reform Project