AGRICULTURAL INPUTS ON HOUSEHOLD CROP PRODUCTION IN UGANDA. ACASE STUDY OF MUKONO DISTRICT (Maize and Bananas)

A RESEARCH REPORT SUBMITTED TO THE COLLEGE OF ECONOMICSAN AND MANAGEMENT SCIENCE IN PARTIAL FULFILMENT OF THE AWARD OF ABACHELOR'S DEGREE IN ART ECONOMICS OF KAMPALA INTERNATIONAL UNIVERSITY.

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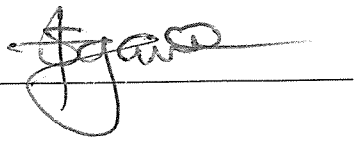
I **ABEL SSEGAWA** registration number **BEC/33847/111/DU** do declare that this research report has been my working and it has never been submitted to any institution for approval



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APPROVAL

This research report has been submitted to the under graduate degrees committee for the award of a Bachelor degree in Art Economic s of Kampala International University with my approval as a supervisor.

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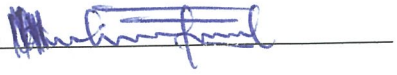

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DEDICATION

This Paper is lovingly dedicated to my parents; Mr. and Mrs. Edward Kiggundu, my friend Mrs. Jane Nassanga Kagoro, who have been a constant source of inspiration, finance, and moral support. They have given me the drive and discipline to tackle any task with enthusiasm and determination. Without their love and support this project would not have been made possible.

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With profound admiration I would like to thank my supervisor Mr. Wakiku Fred for his invaluable guidance and support that enabled me complete this piece of work. Thanks go to Mrs. Nakibuule Suda for the guidance and my colleague Mr. Ayen Moris Okucu for the guidance, all this has enable me to produce this dissertation, not forgetting my parents; Mr. Edward Kiggundu, Mrs. Mary Kiggundu, my siblings; Ssali Timothy, Nassali Angella, Kwauki Andrew, Kisakye Lillian, Nalwanga Irene, Kampako Harriet, Kabugo George, Nagawa Beatrice, Kajjoba Moses, Habara Militon, Herbert Kamara, and Mugerwa Herbert, my friends Mrs. Jane Nassanga Kagoro, Mr. Ssewankambo Arthur, Mr. Bisase Nicholas and Ms Nakandi Ritah for their encouraging advice and cooperation during the entire course.

To all of you, thanks so much, may God reward abundantly.

ABBREVIATION AND ACRONYMS

CIS	Community Development System
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
JESE	Joint Effort Services to Save Environment
MAAIF	Ministry Of Agriculture, Animal Husbandry and Fisheries
MGLSD	Ministry Of Gender Labor and Social Development
MoFPED	Ministry of Finance Planning and Economic Development
NAADS	National Agricultural Advisory Services
NASS	National Agricultural Statistics System
PMA	Plan for Modernization of Agriculture
RDS	Rural Development Strategy
RDS	Rural Development Strategy
SADC	South Africa Development Cooperation
TCC	Talent Call Clubs
UBOS	Uganda Bureau of Statistics
WB	World Bank
SANE	South African New Economic Network
SSA	Sub Sahara Africa

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ABSTRACT

The study seeks to investigate the relationship between agricultural input and household crop production in Mukono District.

The objectives of the study were: to find out the profile of the respondents in term of gender, marital status, age, education level and income level, to determine the relationship between hired labor on plot and household crop production., to find out the relationship between agricultural inputs, and household banana production, to find out the relationship between agricultural inputs, and household maize production, determine the relationship between gender of the household head and household crop production,

It was found that agricultural inputs play a key role in household crop production; female was found to be the major contributors in crop production, education level, change in cropping system, and the level of technology.

In conclusion therefore household crop production cannot stand without agricultural input such gender, education level, cropping system, change in technology such as the use of fertilizers, use of tractors, irrigation among others.

More knowledge on use of organic manure to supplement chemical fertilizer should be given or imparted into farmers. Furthermore, extension efforts should be directed towards promoting the adoption of improved varieties, weeding, and management practices for controlling diseases and field and storage pests. Farmers who intend to store their harvested crops should be advised to treat their stored crops against insect infestation, since hired labor does seem to increase household crop production, there is need to think of other types for labor to supplement household member labor on the plot. This could be in form of government revisiting the old system where tractors and ploughs were availed to almost all sub-counties and would be used by farmers at very low cost because of subsidies from government.

CHAPTER ONE

PROBLEM AND ITS SCOPE

1.1 BACKGROUND OF THE STUDY

Over the last 50 years there has been remarkable growth in agricultural production in China. This has created the so-called 'Miracle in China' with 7% of the world's arable land feeding 22% of the world's population. Chinese cereal production has increased steadily from 83.4 Mt in 1961 to 474.2 Mt in 2009, accounting for 9.5% of total global cereal production in 1961 and 21.8% in 2009. The net increase over this period is 390.8 Mt with an annual growth rate of 3.7%, which is substantially higher than the world mean growth rate in cereal production of 2% during the same period. In 2009, China was responsible for approximately 29.1% of global rice production, 20% of maize, and 16.9% of wheat production (National Bureau of Statistics of China, 1950–2010; FAO, 2010). The success of crop production in China has impacted on both global food supply and on natural resource use and availability and both of these changes have received global recognition.

In the 21st century, agriculture continues to be a fundamental instrument for sustainable development, poverty reduction and enhanced food security in developing countries. Agricultural productivity growth is also vital for stimulating growth in other sectors of the economy. Currently, agricultural productivity growth in Sub Sahara Africa (SSA) lags behind that of other regions in the world, and is well below that required to achieve food security and poverty goals (World Bank, 2007).The trend of agricultural productivity in South Africa is traced back from 1910. Various authors (Liebenberg *et al* (2010); Conradie *et al* (2009); Nin *et al* (2003), Schimmelpfenning *et al* (2000) and Thirtle *et al* (1993)) have had interest in estimating agricultural productivity over the years. Estimates from all these studies have shown that over the years the productivity of the agricultural sector has been fluctuating. In some years it was stagnant whilst in some it was increasing either at an increasing rate or at a decreasing rate.Overall the growth rate of productivity of land grew by 2.49% per year slightly lower than the labour productivity that grew at 2.83% per year between 1911 and 2008. Even so, the productivity of both these inputs fluctuated over the years. Between 1911 and 1940 both labour and land productivity grew at a very slow pace of 0.89% and 1.89% per year (Liebenberg,

2008). The rate of growth of both land and labour productivity then peaked between 1947-1981 at an impressive 4.91% per year for labour productivity and 4.17% per year for land productivity. Since then it declined by 2.67% per year for labour and 1.46% per year for land. Although land and labour productivity in South Africa has remained at 1.46% and 2.67% per year, this level remains high compared to other African countries. This is because the value of output per labour is considerably high in South Africa estimated at $5,663 per worker since 2007. The rapid labour productivity is seen through an increase in agricultural output in South Africa of 1.35% per year from 1961-2007 (Wiebe *et al*, 1998).

The sampling frame for the panel was prepared in consultation with the Kenya National Bureau of Statistics (KNBS) in 1997; although KNBS's agricultural sample frame was not made available. Twenty-four (24) districts were purposively chosen to represent the broad range of agro-ecological zones (AEZs) and agricultural production systems in Kenya

The High potential maize zone, Central highlands, Western transitional and the Western highlands recorded higher level of productivity compared to the Coastal lowlands, Eastern lowlands, Western lowlands and the Marginal rain shadow. However, the lower maize productivity regions of Coastal lowlands, Eastern lowlands and Western lowlands over the decade recorded impressive increase in maize productivity per acre: from 2.0 bags in 1997 to 4.2 bags in 2007 for Coastal lowlands; from 2.3 bags in 1997 to 4.7 bags in 2007 for Eastern lowlands; and from 3.0 bags in 1997 to 5.6 bags in 2000 for Western lowlands. Maize productivity also increased from 2.1 bags/acre in 1997 to 4.6 bags/acre in 2007 for the Marginal rain shadow. The High potential maize zone, else referred to as the Kenyan grain basket, recorded maize productivity increase from 11.5 bags/acre in 1997 to 13.3 bags/acre in 2007. Disaggregating maize yield by cropping system shows that maize productivity has been on an increasing trend for both the pure-stand and inter-crop. Productivity for the pure-stand is, however, higher than for the inter-crop. The mean maize yield per acre for the pure-stand rose from 9.8 bags in 1997 to 11.2 bags in 2007, while that for the inter-crop rose from 6.1 bags in 1997 to 9.1 bags in 2007(KNBS 1997).

Agriculture is the dominant sector of Uganda's economy. This sector contributes about 21 percent to total Gross Domestic Product (GDP) and over 90 percent to total export earnings. It provides 80 percent of employment and most industries and services in the country are based on

this sector. About 85 percent of the population lives in rural areas of the country where they derive their livelihood from agriculture. Much of the agricultural production in Uganda takes place at household level essentially using household labor. It has been estimated that women contribute about 75 percent of the labor force. Agricultural production in the country is based on smallholder production. Recently, various NGOs have assisted farmers with organic and low-input technologies in order to enhance the productive potential of small farmers. Such efforts became an important foundation for the development of new agricultural technologies for poor farmers. Some data on adoption rates of the various techniques promoted have been collected. All South African New Economic Network (SANE) Ugandan NGO partners emphasize similar agro-ecological practices (intercropping, zero grazing, agro-forestry, botanical pesticides, etc.). The adoption level by farmers of the various techniques promoted by Talent Calls Clubs (TCC) and Joint Effort to Save the Environment (JESE) located in Goma Sub-county on the outskirts of Kampala yielded some results. It is interesting to note that those techniques requiring the purchase of equipment or other inputs, even modest, tend to have low adoption rates. For example, due to the simplicity and efficacy of the method, it was expected that liquid "manure", a fertilizer made from green leaves, would be widely adopted. However, out of 25 farmers trained in making liquid manure, only 9 were seen using this technique in follow-up visits. The Community Action for Rural Developments-CARD (active in Lugolole parish, a savanna area in Eastern Uganda 1989) staff explained that the purchase of the relatively cheap containers needed to hold the liquid prevented wider adoption. Similarly, demonstrations on making solar ovens did not lead to the adoption of the technique because the ovens require glass, which costs US $20. The agricultural sector is composed of both the monetary and non-monetary subsectors. Its share in GDP has declined from 64.1 percent in 1985 to 41.0 percent in 2001. The non-monetary subsector of agriculture has been the most affected declining from 39.9 percent of total GDP in 1985 to 22.7 percent in 2000. Nonetheless, the agricultural sector remains the backbone of Uganda's economy as its main source of livelihood and employment for over 60 percent of the population. It contributes over 70 percent of Uganda's export earnings and provides the bulk of the raw materials for most of the industries that are predominantly agro-based. Agricultural output primarily comes from about 3 million smallholder subsistence farmers, who own an average farmland area of 2.5 ha. The agricultural sector is dominated by the production of food crops, but cash crops, livestock, fishery and forestry are also important.

Food crops accounted for 72.4 percent of agricultural GDP in 1985, falling to 65.3 percent in 2000. The main food crop is bananas, which accounted for 28 percent of the total cropped area in 2000, followed by cereals, root crops, pulses and oilseeds with 25 percent, 17 percent, 14 percent and 8 percent of the area, respectively. Despite the dominance of food crop production, only one-third is marketed. Cash crops, livestock, fish and forestry accounted for 4.5 percent, 16.5 percent, 4.0 percent and 2.6 percent of agricultural output in 1985, and 8.9 percent, 6.9 percent, 4.6 percent and 4.3 percent in 2000, respectively. Although Uganda is able to meet its domestic food needs, food products like wheat and rice are imported to cater for the urban population. Uganda's exports are dominated by traditional cash crops such as coffee, cotton, tea and tobacco, with coffee being the principal export crop. However, the share of traditional cash crops in total exports has declined from 96.0 percent in 1985 to 38.3 percent in 2001. This fall is mainly attributed to the collapse of world coffee prices and failure to add value to the cash crops as well as the high dependence on a few export commodities. The contribution to export earnings of non-traditional export products that include fish, maize, hides and skins has increased because of trade liberalization and an aggressive export promotion campaign by government.

Uganda's main food crops have been plantains, cassava, sweet potatoes, millet, sorghum, corn, beans, and groundnuts. Major cash crops have been coffee, cotton, tea, and tobacco; although in the 1980s many farmers sold food crops to meet short-term expenses. The production of cotton, tea, and tobacco virtually collapsed during the late 1970s and early 1980s. In the late 1980s, the government attempted to encourage diversification in commercial agriculture that would lead to a variety of nontraditional exports. The Uganda Development Bank and several other institutions supplied credit to local farmers, although small farmers also received credit directly from the government through agricultural cooperatives. For most small farmers, the main source of short-term credit was the policy of allowing farmers to delay payments for seeds and other agricultural inputs provided by cooperatives (worldbank 1982)

Cooperatives also handled most marketing activity, although marketing boards and private companies sometimes dealt directly with producers. Co-operatives had been very successful during the British Colonial period (see below) but later many farmers complained that cooperatives did not pay for produce until long after it had been sold. The generally low producer prices set by the government and the problem of delayed payments for produce prompted many farmers to sell produce at higher prices on illegal markets in neighboring countries. During most of the 1980s, the government steadily raised producer prices for export crops in order to maintain some incentive for farmers to deal with government purchasing agents, but these incentives failed to prevent widespread smuggling of Household outputs, adding **value** to production and ensuring a stable market for selected agricultural products. One way of monitoring these objectives is through the establishment of a well organized Community Information System (CIS) supplemented by National Agricultural Statistics System (NASS) building blocks of:

i. Population and Housing Census – Agricultural Module,

ii. Uganda Census of Agriculture and Livestock,

iii. Agricultural Sample Surveys under UNHS,

iv. Permanent Agricultural Statistics System and

v. Other Institutions such as Meteorology Department etc.

1.2 Problem Statement

Uganda has one of the lowest crops and livestock yields in Sub-Saharan Africa (SSA), despite a good agro climatic environment (yields on research stations are 2 to 5 times higher than farm yields) (FAO 2006). It is widely believed that the stagnation of agricultural productivity in Uganda can be traced to little use of modern inputs, yet about 30 percent of Ugandan soils are categorized as being of low productivity. The reduction in growth resulted mostly from a prolonged drought, leading to reduced agricultural production and other factors (FAO 2006). The hurdle is to know why despite all above applications (including introduction of drought resistant crops), the food security situation still remains somehow un-certain and why most crop yields remain dropping towards under one ton/hectare (UBOS 2005), despite the government programmes such as NARO,NAADS, PAM figures show that growth in the agricultural sector continues to decline shapely for instance the hunger free says agricultural output declined from 7.9 percent in 2001 to 2.1 percent in 2008 (UBOS 2009).

One of the important factors underlying the low level of modern input use is lack of an efficient distribution system that would ensure timely availability of inputs at reasonable prices. To increase agricultural productivity in Mukono, there is need to use productive inputs like fertilizer, pesticides, and high-yielding crop varieties. There is need to carry out studies on productivity efficiency and input use, and to determine product-input combination and product-product mix (IFPRI, 2003), hence this gives the fertile ground to justify the need for immediate intervention and consequently the need for this study in Mukono District.

1.3 Purpose of the Study

The purpose of this study was to investigate the relationship between agricultural inputs and household crop productivity in Mukono District.

1.4 Research Objectives

1.4.1 General objective

The general objective of this study was to establish the relationship between agricultural inputs and household crop productivity.

1.4.2 Specific objectives

1 To find out the profile of the respondents in term of gender, marital status, age, education level and income level.

1. To determine the relationship between hired labor on plot and household crop production.
2. To find out the relationship between agricultural inputs, and household banana production
3. To find out the relationship between agricultural inputs, and household maize production
4. Determine the relationship between gender of the household head and household crop production.

1.5 Research Question.

1) What is the profile of the respondent in term of gender, marital status, age , education level and income level.
2) What is the relationship between hired labor on a plot and house hold crop production?
3) What is the relationship between inputs and household banana production?
4) What is the relationship between inputs and house hold maize production?
5) What is the relationship between gender of household heads and household crop production?

1.6 Hypothesis

Ho: there is no significant relationship between agricultural inputs and crop production (maize and bananas) in Mukono.

H1: there is significant relationship between agricultural inputs and crop production (maize and bananas) in Mukono.

1.7 The geographical scope

The study shall be carried out in Mukono district. Mukono has a total population of 551,000,with a total area of 1795.6Km^2(UBOS 2012) .Mukono grows a variety of crops which include :bananas ,potatoes, cassava, legumes such as beans, cow peas, ground nuts, cereals such as maize, millet, for this the study will focus on bananas and maize .

1.7.1The theoretical scope

The study is guided by the Lewis (1954) model of production in agricultural sector.

1.7.2 The content scope

This study was limited in determining the relationship between agricultural input and household crop productivity in mukono district.

1.7.3 Time scope

The study was being carried out between Feb and oct 2013.

1.8 Significance of the study

The research study is significant to the following stakeholders;

The government /policy makers; the government can base on the findings to formulate and implement land use policies, crop production policies and modern technique of farming. Such policies can be platform for sustained crop productivity and development.

The study is useful to the academician. Especially researchers who may be interested in carrying out empirical studies on agricultural inputs and crop productivity in Mukono District.

The study is useful to an individual. This will make farmer to understand whether the use of agricultural inputs such tractors, fertilizer, drought resistance crop among others can lead to high or low crop productivity.

1.9 Operational Definitions of key terms

Agricultural inputs

These are item used by farm in the production of goods and services. For example, seed, fertilizers, chemicals, feed, machinery, fuel, labor, and land are farm input (Wesley et al 1994).

Crop productivity

This is the measure of average output or real output per unit input. For example the productivity of labor may be determined by dividing hours of work into real output (Wesley et al 1994).

CHAPTER TWO
LITERATURE REVIEW

Concept, Ideas, Opinion from Authors/Expert

2.1 Agricultural inputs

Agricultural inputs

These are item used by farm in the production of goods and services. For example, seed, fertilizers, chemicals, feed, machinery, fuel, labor, and land are farm input (Wesley et al 1994).

Crop productivity

This is the measure of average output or real output per unit input. For example the productivity of labor may be determined by dividing hours of work into real output (Wesley et al 1994).

The Food and Agricultural Organization (FAO) of the United Nations (1990) indicated that there is mounting evidence that Rural Non Farm (RNF) income is an important resource for farm and other rural households, including the landless poor as well as rural town residents. However, the traditional image of farm households in developing countries has been that they focus almost exclusively on farming and undertake little rural non-farm (RNF) activity. This image persists and is widespread even today. Policy debate still tends to equate farm income with rural incomes, and rural/urban relations with farm/non-farm relations. Industry Ministries have thus focused on urban industry and Ministries of Agriculture on farming, and there has been a tendency even among agriculturists and those interested in rural development to neglect the RNF sector. One of the main reasons why the promotion of RNF activity can be of great interest to developing country policy-makers is in the face of credit constraints, where RNF activity affects the performance of agriculture by providing farmers with cash to invest in productivity-enhancing inputs. Furthermore, development of RNF activity in the food system (including agro-processing, distribution and the provision of farm inputs) may increase the profitability of farming by increasing the availability of inputs and improving access to market outlets. In turn, better performance of the food system increases rural incomes and lowers urban food prices (FAO, 1990).

2.2 The relationship between agricultural input and crop productivity

Female-Headed Households and access to Inputs

IILS (2006) showed that it is worth underlining the position of female-headed households with agricultural livelihoods, who are often poor because of limited ability to mobilize labour for farming, restrictions on access to credit and inputs, and exclusion from off-farm income. These are an important "excluded group" in sub-saharan Africa, where a common pattern is for the men to migrate to work in the urban areas and the women to work land to which they have access through continued use under indigenous tenure systems (see Bush, Cliffe and Jansen 1986). The internal dynamics of these "doubly-divided' households is complex, and conflicts, and abandonment, may particularly reflect the impossible position both women and men find themselves given their allotted gender roles in conditions of economic stress (Whitehead 1990 for a brief, but subtle account).

There is a strong correlation between the destitute, 'poor peasant' families and the women-headed households who number roughly 30% of rural households in most of southern Africa. Many of these are without regular remittances of earnings from elsewhere and their own production is massively constrained as they have less chance of access to land, and to oxen for ploughing, and are also short of labour at crucial seasons, with the result that, in Botswana, 80% of all those working for rations' in drought relief projects were women. (Bush, Cliffe, and Jansen 1986: 298-99).

Chipande (1986) in his study on "exclusion of women from credit and inputs in an agricultural development scheme in Malawi" documents said the inability of female-headed households to mobilize labour led to a poor credit rating for those households and, as a result, severe restrictions on access to inputs.

Access to Agricultural Inputs in Uganda

The current productivity observed in the Ugandan farming community is very low, in many cases much lower than the genetic potential expressed under optimal conditions in research stations (NARO, Annual Reports, 2000–2005). This low productivity is due to soil fertility depletion, heavy reliance on basic indigenous technology including the use of unimproved and low-yielding planting material, limited practice of crop protection, high postharvest losses

arising from inadequate storage and processing capacity, etc. (Ministry of Finance, Planning and Economic Development, 1998).

Accordingly, the PMA seeks to improve agricultural input market access through various strategies, including: 1) improving the availability and timely distribution of high yielding, quick maturing, pest and disease-resistant planting and stocking materials; 2) encouraging the participation of the private sector in seed multiplication, processing and marketing; 3) promoting the use of fertilizers by farmers; and 4) developing an effective network of stockists to make vital inputs available and accessible to the farming community (Government of Uganda 2000). Seed is a crucial input determining yield (Muhhuku 2002). If bio–fortified varieties are to attain rapid, widespread distribution through an efficient seed scheme must be in place. For grain crops this will be available with the setting–up of Uganda Seeds Limited (USL) and the proposed close linkages with NARO and NAADS.

A major factor-influencing yield is seed quality. The seed industry in Uganda is largely undeveloped, with farmers relying almost entirely on their own low-yielding seed supplies. The Government of Uganda recognizes that both the public and private sectors have critical roles to play in the development of the seed industry. The major interventions include:
Uganda Seeds Limited (USL), a limited liability company wholly owned by Government, was incorporated in 1999 to assume the functions of Uganda Seed Project formerly under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), which is in line with the conditionality of the African Development Bank that funded the former Government project, Uganda Seeds Project, on condition that Private Sector Participation would be introduced in the operations of Uganda Seeds project to ensure sustainability and efficient delivery of improved seeds to the farming community in Uganda (United Nations Industrial Development Organization, *2005*).

Determinants of input availability and accessibility.

Government has, for the past decade, undertaken a number of policy reforms to encourage and promote the private sector's role in input distribution to producers. Despite the reforms, the majority of farmers still do not have access to productive inputs. It is not clear whether the low rate of use of such inputs is related to their supply or demand. It is, therefore, necessary to

conduct policy research on the following areas: domestic production vs. importation of inputs; government input distribution policy; capacity of private sector to distribute inputs; incentive structures for the private sector; institutional and structural barriers to trade in inputs; effect of input prices on rates of adoption by farmers and production incentives; key inputs needed; and regulatory and monitoring mechanisms to prevent environmental damage and underground water pollution.

Return to input use.

Return to factors of production is very low in Uganda. Most farmers are not able to realize a return to their efforts. This is primarily due to low market prices, poor yields, and poor access to markets. What is required is policy research to address the following questions: What are the returns to investment under different production systems? What are the opportunities for the private sector to invest in agriculture and what are the constraints and available incentives (IFPRI, 2003)?

Government Strategy for Developing the Agricultural Sector

The National Agricultural Advisory Services (NAADS) and Plan for Modernization of Agriculture (PMA) were designed and adopted by Government as the Master Plan for agricultural development in the country. The government of Uganda established the Community Information System (CIS) to ensure that reliable and meaningful data and information is generated and accessed at household, parish and other administration levels. The CIS household register solicited information from the respondents on the different types of crops grown by households. Caution should be taken while comparing results from the CIS with that of UCA 2008/09. The UCA 2008/09 covered the 80 districts as of 2007, while CIS collected data from 47 districts out of 112 districts as of July 2011. It should be noted that by July 2011 some districts had been split increasing the number of districts from 80 to 112.

According to the National Budget Framework Paper for the Financial Years 2005/06 to 2007/08, the objectives of the Rural Development Strategy (RDS) include increasing farm productivity.

Constraints of input use

a) Disaggregation

Insufficient disaggregation of inputs implies the inability to assign inputs to particular outputs. For example, the total amount of fertilizer or labor may be known, but how they are allocated among agricultural products may not. This is of particular importance when allocation of inputs is skewed to a minority of producers or crops such that reallocation could greatly improve total agricultural output.

Perhaps a greater problem exists with public expenditures and how to allocate them to agriculture.

In indigenous land, tenure systems in which a household is allowed to put under cultivation as much land as it can use, the ability to mobilize labor resources, through control of the household, is a central determinant of wealth and poverty when land is abundant (Binswanger and MacIntyre, 1987; Meillassoux 1981; and Smith 1991). As available land becomes scarce, the application of inputs which enhance land productivity become more important than expansion of the area of production in determining total production, and access to those inputs become more important in determining agricultural livelihoods. "Modern" inputs can offer a way of cultivating land intensively without degradation (though this is not always so). With the commercialization of production, livelihoods also depend upon the ability to cultivate high-value crops and access to output markets.

These considerations mean that agricultural livelihoods depend on the interaction between access to productive inputs, high-value crops, and output markets. These interactions are complex. They are taking place within an international frame, in the sense that the prices of many of the agricultural commodities produced and agricultural inputs used in Africa are determined in international markets. Agricultural policies are also the subject of negotiations surrounding the implementation of structural adjustment programmes.

A recognized problem is simply in measuring output. Kelly et al. (1995) estimate that data collection methods underestimate African agricultural production by up to 50 percent. This is because mixed cropping is common, crop by-products are not enumerated, crops are consumed at home or as inputs to other household production activities, or farmers have diversified into new products that are poorly enumerated in national surveys.

Agricultural extension in Uganda has undergone a number of transformations from regulatory 1920- 1956, advisory 1956-1963, advisory education 1964-1971, dormancy 1972-1981, recovery 1982- 1999, educational 1992-1996, participatory education 1997-1998, decentralized education 1997- 2001 and now agricultural services under contract extension systems. Each of those up to 1997- 2001 had strengths to build on and weaknesses to change or improve, but had challenges of the socio-economic and political environment. In addition there have been marked changes in the concept of agriculture, which is increasingly seen in terms of commercial or farming for market with emphasis on modernization of agriculture and use of participatory approaches in the process.

All evolutions over time through transformation into unsustainable service were for several reasons; There was no policy on agricultural extension until the establishment of National Agricultural Advisory Services (NAADS), the transformation of extension did not build on the strengths of the past, the relied upon expert advice has mainly been foreign more than local and the dependence on donor funding; The policy and mechanisms to empower the farmer to demand, pay and control extension services are in place (*Semana, 1999*).

The dilemma is that the majority of the Ugandan farming community is predominately peasantry subsistence with a small fraction that can be regarded emergent farmers. Such population may not respond sustainably to the now farmer owned contract extension system including changing patterns of donors.

2.6.3. Quality Agricultural Services for Uganda's Farmers

Low productivity of Ugandan farmers is attributed to research and extension services that are not adequately demand-driven and low use of new technologies by farmers even when they are available. Uganda's Plan for the Modernization of Agriculture assigns first priority to agriculture extension and research, focusing on achieving greater relevance in both the research and extension programs. This effort is supported by a multi-donor National Agricultural Advisory Services Project (NAADS)–designed to make poor farmers aware of and equipped to adopt, improved technology and management practices. By the end of 2006, the project was operating in 37 districts out of a total of 80. By the end of 2007, it is expected to have reached 64 districts.

Surveys carried out in 2006 indicated that farmers in those counties covered by the NAADS Project are adopting technologies that lead to real improvements in yields and farm incomes. Productivity of those farmers is reported to be 27 percent higher than those in areas not currently served by the project (IDA/World Bank, 2007).

It should be noted that;

1. The NAADS project continues to expand rapidly.
2. 64 percent of farmers groups have reported replicating some aspects of the new project technology on their own fields.

2.7. Agricultural Research and Technology Development

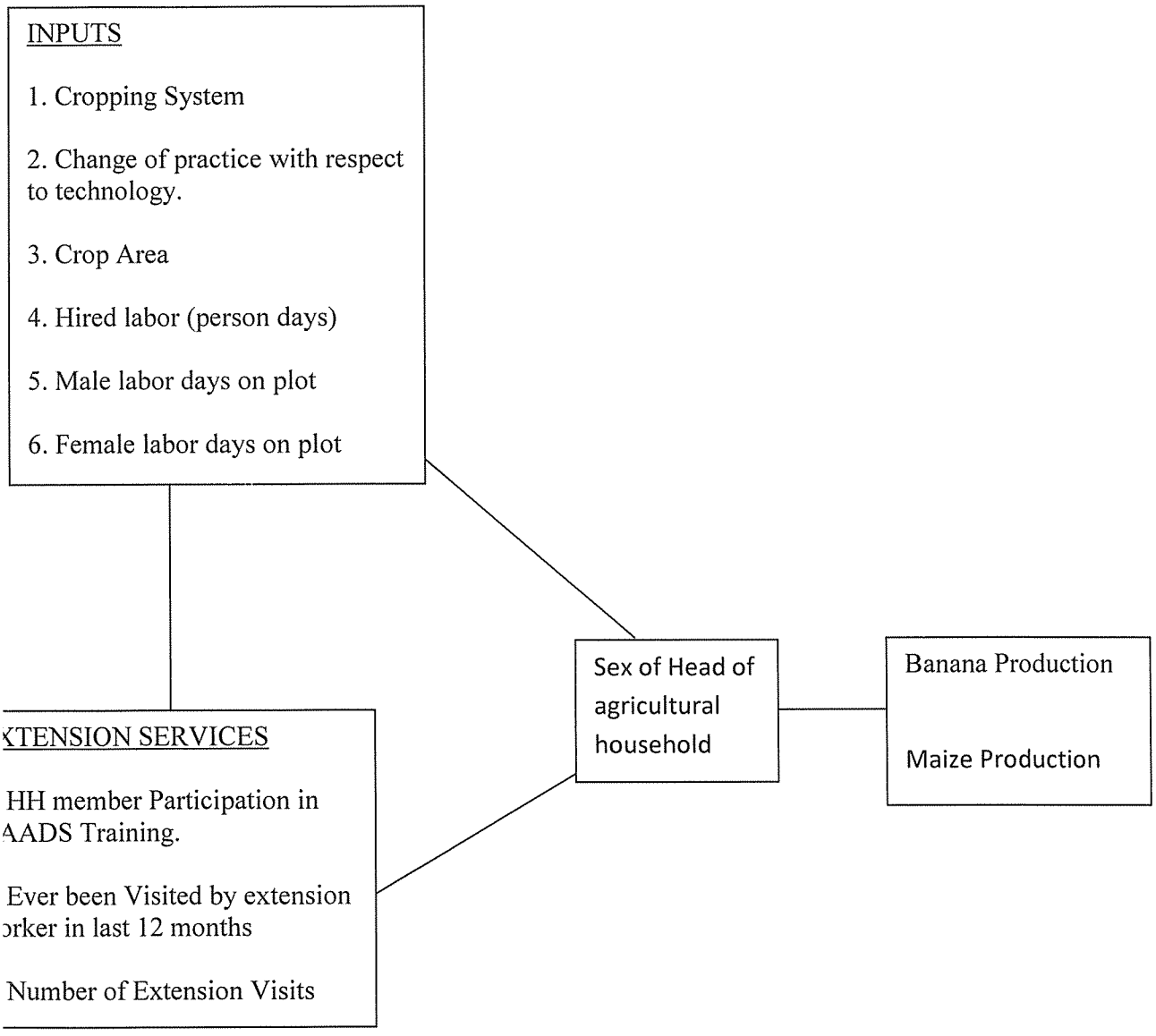
Agricultural transformation is seen to start by increasing the productivity per unit area through adoption of high-yielding, pest and disease-resistant crop varieties, use of appropriate crop and animal husbandry practices, maintenance of soil fertility through use of organic and inorganic manures, and the development of soil water management skills (MAAIF/MFPED, 2000).

In an effort to make agricultural research more needs-oriented, the Government of Uganda carried out an extensive review of the entire National Agricultural Research System (NARS), under the auspices of the PMA in 2001.

The new policy will ensure that: (a) technology decisions are made only after the issue has been discussed by representatives of all groups likely to be affected by the activities/decisions; (b) each new technology will be considered in terms of its costs and benefits, including the opportunity costs of the required inputs and the market prospects for increased output; and (c)

researchers and advisors will examine potential risks and labor requirements and their possible effects on different categories of people in rural households and will discuss their findings with the relevant groups (e.g. farmers) prior to enactment. In this way, it is hoped that the future technologies developed and made available under the NARS will better reflect and address the problems experienced by various categories of farmers, especially resource-poor individuals such as women and children (ASWG, 2003).

2.7 Conceptual Framework



Source: Researcher (2013)

The above stipulated conceptual framework demonstrates the exit criteria for the Household crop production based on Agricultural Inputs, Extension Services and Sex of Head of Households. Household Banana production and or Maize production were used as performance indicators to evaluate the effects of the independent variables on household crop production since they are the main crops in the Uganda (UBOS, 2006 and 1999/2000).

The theoretical study

As with the Harrod-Domar model the Lewis model is a development model not a strategy. W. Arthur Lewis put forward the model in the 1950s and there have been variations since. It tries to explain how a developing economy moves from a traditional agricultural base to a modern manufacturing led economy. The model assumes that a developing economy has a surplus of unproductive labor in the agricultural sector. These workers are attracted to the growing manufacturing sector where higher wages are on offer. It is also assumed that the wage on offer in the manufacturing sector is fixed. Entrepreneurs in the manufacturing sector will make a profit because they charge a price above the fixed wage rate. The model then assumes that these profits will be reinvested in the business in the form of more fixed capital. Firm's productive capacity is thus increased and entrepreneurs will demand a greater amount of labor. More workers will be employed from the surplus found in the agricultural sector. The process continues until all surplus labor from the agricultural sector has been employed. The manufacturing sector has grown and the economy has moved from a traditional to industrialized one.

Related studies

Age

The age of farming household heads was observed to have an inverse relationship with productivity of farmers in studies from Adeoti (2002), Ajibefun and Abdulkari (1999, 2004), Ajibefun and Daramola (1999), Ajibefun et al. (2002 ,2006), Coelli and Battesse (1996), Idjesa (2007), and Ogundele (2003). All of these studies were carried out in the humid forest, dry savannah, and moist savannah regions of Nigeria, except for the Coelli and Battesse study, which was carried out in India. This was understandable since it is expected that as a farming household head becomes older his or her productivity will decline.

Age is also positively correlated with productivity; older farmers have also been observed to have higher productivity than younger farmers. For example, Ajani (2000), Ajibefun and

Abdulkadri (1999, 2004), Ajibefun et al (2002, 2006), and Idjesa (2007) observed that productivity in the humid forest and moist savannah agro-ecological zones of Nigeria was positively associated with more experience in farming.

Residency Status

As observed by Adeoti (2002), the residency status of a farming household head positively influenced productivity in the dry savannah agro-ecological zone of Nigeria. This was likely because non-residents were likely to have problems managing their farms effectively, while resident farming household heads, who lived very close to their farms, did not have this problem.

Land Ownership

Closely related to the factor of residency status is the land ownership status of farming households. Adekanye (1988), Ajani (2000), Akinseinde (2006), Babalola (1988), and Olawoye (1988) showed that farmers that owned parcels of land on which they farmed were more productive than non-landowning farming households. This was understandable since farmers that owned land on which they farm were ready to make huge investments on such land through the adoption of new technological packages which enhance productivity levels. Adekanye (1988) provided empirical evidence showing that women had a lower level of productivity than men because they had far less access to land and other productive inputs.

Education

Education is one of the key assets needed to foster productivity in any profession. Findings of Adetiba (2005), Adeoti (2002), Ajani (2000), Ajibefun and Abdulkadri (1999, 2004), Ajibefun et al. (2002, 2006), Amaza (2000), Bravo-Ureta and Rieger (1991), Idjesa (2007), Idumah (2006), and Kehinde (2005) confirmed that education was key to enhanced productivity among farming households in the humid forest, dry savannah and moist savannah agro-ecological zones of Nigeria and in New England. This was likely because good education propels heads of farming households to adopt new innovations and technologies that are vital to enhancing farm productivity.

Farm Size

The effect of farm size on farm productivity is inconclusive. Lau and Yotopolus (1971) using the profit function equation found that small farms attained higher productivity levels than larger farms in India. Sahidu (1974) adopted the Lau-Yotopolous model to sample India wheat

farms and came up with a contrary conclusion showing large and small farms exhibiting equal levels of productivity. Khau and Maki (1979) using the Lau-Yotopoulous model in Pakistan observed, however, that large farms were more efficient than small farms. Using a normalized profit function and stochastic frontier function, Ajibefun et al (2002) and Mbata (1988) showed that large farm size enhanced productivity among farmers in the dry savannah and humid forest agro-ecological zones of Nigeria.

Crop Mix, Rotation, and Diversification

The issue of crop mix, rotation, and diversification and how it affects agricultural productivity were considered by Amaza (2000), Idjesa (2007), Idumah (2006), Mijindadi (1980), and Udoh (2000). Findings showed that crop mix, rotation, and diversification, when properly adopted, promoted productivity among crop farmers in the dry and moist savannah agro-ecological zones of Nigeria.

Gender

The connection between agricultural productivity and gender were well documented in the studies of Adekanye (1988), Babalola (1988), and Odii (1992), and Olawoye (1988). Odii (1992) observed that the contribution of female farmers to agricultural productivity was highly significant. Adekanye (1988) offered evidence of gender differentials in agricultural productivity in Nigeria with women's lower productivity arising from their weak bargaining position within the family and in the labor market. Further support for this gender bias in Africa derives from the fact that women have far less access to land and other productive inputs (Babalola, 1988, Olawoye,1988).

Dependency Ratio

A high dependency ratio and high ratio of female adult were factors identified by Akinseinde (2006) as detrimental to productivity. Using data envelopment analysis and the Tobit model, the study showed that the higher the dependency ratio and the higher ratio of female adults to all adults living on the farm in the humid forest agro-ecological zone of Nigeria, the lower the farming household productivity.

Labor

Adebayo (2006), Ajibefun and Abdulkadri (2004), Ajibefun et al (2002), Amaza and Olayemi (2002), Dittoh (1991), Ogundele and Okoruwa (2006), and Tella (2006) all assessed how labor affected farm productivity in the dry savannah and humid forest agro-ecological zones of

Nigeria. Using analytical tools such as the Cobb-Douglas production function, the normalized profit function approach, and the stochastic frontier model, Amaza and Olayemi (2002), Dittoh (1991), and Tella (2006), observed that the use of hired labor reduced productivity when not properly utilized. Adebayo (2006), Ajibefun and Abdulkadri (2004), Ajibefun et al, (2002), and Ogundele and Okoruwa (2006), however, showed that hired labor contributed positively to farm productivity.Outside Nigeria, Mochebele and Winter-Nelson (2002) investigated the impact of labor migration on technical efficiency performance of farms in Lesotho. Using stochastic frontier production, the study found that households that sent migrant labor to South African mines were more efficient than households that did not, with a mean technical efficiency of 0.36 and 0.24 respectively. Similarly, Nkonya et al. (2005) observed that pre-harvest labor positively affected crop production in Uganda.

Access to Fertilizer, Agro-Chemicals and Improved Seeds/Planting

Access to fertilizer, agro-chemicals, and improved seeds/planting materials has been proven as an important driver of agricultural production and productivity among farmers in Sub-Saharan African. Using stochastic frontier model, Mbata (1988) and Ogundele and Okoruwa (2006) observed that the use of fertilizer increased agricultural productivity of crop farming in the dry savannah and humid forest agro-ecological zones of Nigeria. Nkonya et al (2005) also alluded to the positive impact of fertilizer. The use of herbicides according to Mbata (1988), Ogundele and Okoruwa (2006) had a positive correlation with technical efficiency or productivity of farmers.

Ogundele and Okoruwa (2006) using the stochastic frontier model revealed that the use of improved seed had a positive impact on the technical efficiencies of crop farmers. This finding was consistent with Nkonya et al (2005), who also showed that purchased seeds had a positive impact on a farmer's productivity in Uganda. Tella (2006), however, showed that improved planting materials when not utilized in the recommended proportion could reduce a farmer's productivity. However, the positive contribution to efficiency of farmers having access to improved planting materials could be reversed if the costs were relatively high and out of the reach of farmers. Adewuyi (2002) using the linear programming and Tobit models observed that the high cost and inadequate supply of input (plant material inclusive) negatively affected productivity.

Access to Roads and Transport

Access to roads and transport is also important to improving productivity. According to Adewuyi (2002) poor roads negatively affected farming households' productivity. Using a related factor, Okike (2000) used the stochastic frontier model to show that the high cost of transportation reduced productivity of livestock farmers in the dry savannah and humid forest agro-ecological zones.

Access to Credit

Another important factor that has been empirically proven to influence productivity is credit. Akinseinde (2006), using data envelopment and the Tobit model, showed that having access to credit facilities contributed positively to a household's production efficiency in the humid forest agro-ecological zone of Nigeria. Similarly, Obwona (2000), using the translog production function, showed that access to credit contributed positively towards the improvement of efficiency among tobacco farmers in Uganda.

Access to Extension Services

Access to extension services has been identified as key to farm productivity in a series of studies. Obwona (2000), using the translog production function, demonstrated that access to extension services by tobacco farmers improved their productivity in Uganda. In contrast, Bravo- Ureta and Rieger (1991) using the stochastic efficiency decomposition model based on Kopp and Diewert's deterministic methodology, concluded that extension services did not markedly affect productivity of farmers in New England. However, the studies of Adewuyi (2002), Ajani (2000), Amaza (2000) and Awotide (2004) all reported that extension services enhanced farmers' productivity in the humid forest and dry savannah agro-ecological zones of Nigeria.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The study employed a cross sectional survey design since it examined data for a short time; it also used descriptive-correlation since it is interested in examining the relation between agricultural inputs and crop productivity. Analysis of variance (ANOVA) performed to assess the effect of any of the categorical variables on the household crop production (of each of the two crops).

3.2 Study Population

The study conducted in Mukono District among farmers .it will include a total of 475 farmers.

3.3 Sampling size

A sample size representative of the study population will be selected using simple random sampling and purposive sampling .A representative sample, according to Gall (1996) gives results that can be generalized to the study population. Solven's formula will be used to compute the minimum sample size as can be seen below.

$$n= \frac{N}{1+N(\sigma)2}$$

Where n= sample size

N= target population

$\sigma = 0.05$ coefficient of validity

$$n= \frac{475}{1+475(0.05)2}$$

n=100, of which 50 respondents were for maize growers and 50 respondents were for bananas growers.

3.4 Sampling Selection Procedure

Sampling selection is by use of probability sampling technique especially simple random sampling a purposive sampling .simple random sampling is use because the study intends to select a representative without bias from accessible population. This ensures that each population member of the target population has an equal and independent chance of being included in the sample.

3.5 Data Sources

The method of data collection was questionnaires and interview guides.

3.5.1 Primary Data

The study used primary data sources. Primary data was obtained by use of questionnaires and interview guides.

3.5.2 Secondary Data

The researcher used Secondary data sources with an aim of comparing secondary data with responses to primary data that was gathered in order to get a meaning full and objective interpretation of findings. Secondary involved review of the existing literature such as internal report, research dissertation, text books and internet.

3.6 Data Collection Instruments and Methods

3.6.1 Questionnaire survey

This study used a self-administered questionnaire and semi structured instruments to collect data from students. McMillan and Schumacher (2001) recommend a questionnaire if the researcher knows that the respondents were in position to answer the questionnaire. Closed ended and scaled items was carefully be used to generate information of influence, facilitate response since the questions with multiple choices and data was categorized easily. The scaled items, according to Macmillan and Schumacher (2001) allow fairly accurate assessments of opinions. Similarly, it had the ability to solicit information from several respondents within a short time (Gupta, 1999).

3.6.2 Key Informant Interviews

Face to face interviews was carried out with the management personnel from these were designed in a way that more specific and truthful answers were got. These helped to capture information, not provided by the questionnaires. This method was preferred because of its flexibility and ability to provide new ideas on the subject (Kothri, 1990).

3.6.3 Document Analysis

Secondary data from materials such as textbooks, newspapers, journals and internet was used to back up primary information and relate the findings to other approaches already in existence. The method used document checklists and guides to get views from other writers which are instrumental especially in comparison analysis and literature review.

3.6.4 Observation

The study used observation method to find out for himself what's exactly on the ground.

3.7 Procedure of Data Collection

After the approval of the proposal, the researcher got a letter of introduction from the college of economics and management sciences to enable him to proceed to the field. After ascertaining the reliability of the instruments, the researcher proceeded to administer the area of study. Interviews was conducted and recorded by the researcher. The data collected was computed with the use of computer, edited and coded to minimize obvious errors. Then data was grouped into tables and frequency graphs. The collected data was analyzed using scientific package for social sciences; interpreted and then discussed.

Ethical Consideration

Informed consent: Participants was given the choice to participate or not to participate, and furthermore be informed in advance about the nature of the study.

Right to privacy: The nature and quality of participants' performance was kept strictly confidential.

Honesty with professional colleagues: Findings was reported in a complete and honest fashion, without misrepresenting what had been done or intentionally misleading others as to the nature of it. Data is not fabricated to support a particular conclusion.

Confidentiality/Anonymity: Confidentiality or anonymity was practiced since it led to participants giving more open and honest responses.

3.7.1 Quality Control

Validity of Instruments

Validity refers to the extent to which a method of data collection presents what it is supposed to do, or the extent to which a method of data collection measures what it is supposed to measure (Bell, 1997). To establish the validity of instruments, instruments was pre-tested by administering the questionnaires to 5 respondents; however they will not be included in the study. This was intended to correct any errors that might have been identified before the main study.

The questionnaire's validity was determined by getting the relevant items according to the experts divided by the total number of items; that was;

$$\text{Content Index} = \text{CVI} = \frac{k}{N,}$$

Where k=Total number of Items rated as Yes, No, use of True and False.

N=Total number of Items in the questionnaire.

According to Amin (2005), if the Content Validity Index is 0.7 and above, it means the instrument used is valid.

Reliability of Instruments

Reliability according to Amin (2005) refers to the degree to which the instrument consistently measures whatever it is measuring. Hence, the researcher ensured reliability by constructing thorough conceptual framework in which the terms used in data collection instruments will be analyzed and explained. The researcher will also request his supervisor and two other experts in both quantitative and qualitative research from the faculty of management studies to review the instruments. The questionnaire and the structured interview will be improved and adjusted according to the recommendations provided by the supervisor.

3.8 Data Analysis

Information obtained from questionnaires, interviews and document analysis will shall be regularly coded and updated on a coding framework. Qualitative data will be descriptively analyzed while quantitative data will be analyzed using a statistical package for social sciences (SPSS). The researcher will a quantitative research design using descriptive statistics such as frequency counts, percentage charts and averages for structured items; meanings shall be

contextualized, interpreted and organized according to their sources. The Pearson correlation coefficient (r) was used to to determine the strength of relationship between Agricultural input and crop productivity .Regression analysis was also used to determine the the relation between the two variables.

The formula that exhibit the relationship is as seen below

Household crop productivity = α+ (Agricultural input)β

$Y == \alpha + \beta_i x_i + e_i$

Where Y represent household's crop production (maize and bananas).

x_i represents the categorical variables

β_i represents a change in the households crop production as result of categorical variables.

e_i represents the error term

The correlation coefficient was be obtained from

The following formulae and computational formula were used.

The correlation is given by

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{(n\sum x^2 - (x)^2)((n\sum y^2 - (y)^2)}}$$

The $\mathbf{t_c}$ compute was is

$$t_c = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

Reject H_0 if $\mathbf{t_c} \geq \mathbf{t}\alpha$ at 0.05 level of significance

3.9 Limitations of the Study

In view of the following threats to validity, the researcher claimed an allowable 5 percent margin of error at 0.05 level of significance. A measure was indicated in order to minimize if not to eradicate the threats to the validity of the findings of the study.

The researcher encountered the following limitations:

i. The researcher met substantial costs especially on secretarial work, transport and communication. However, he tried to solicit for financial support from friends and family members.

ii. Some respondents may not be willing to answer the questions firstly because of undue influence from their superiors and secondly, to some they may be seeing no reason to participate or withdraw from participation without informing the researcher. Emphasis of confidentiality in the questionnaire and letter of introduction from the University however was used to encourage them to respond.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, DISCUSSION AND INTERPRETATION OF FINDINGS

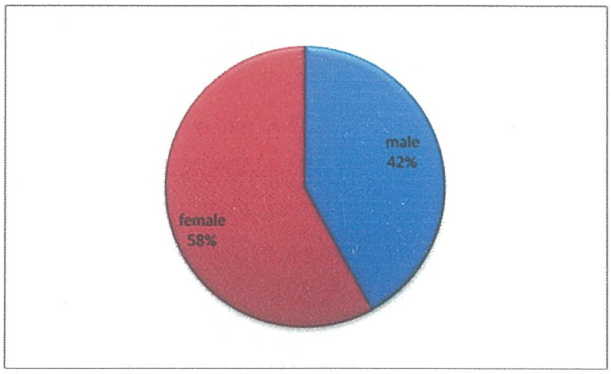
4.0 Introduction

This chapter presents findings through systematic comparison and contrast of findings from the literature, and identifies any new in references and insight on the problem. The findings were based on the objectives and research questions of the study.

4.1 Findings on the Agricultural Inputs and Households Crop Productivity in Mukono District.

4.1.1 Finding from the background of the respondents who participated in questionnaire process (Bananas crop production)

Figure 1: A pie chart showing bananas growing respondent.



Source: Primary Data

This indicates that there were (29) 58 percent of female household who participated in bananas crop production and only (21) 42 percent of male households were involve in bananas crop production in Mukono District.

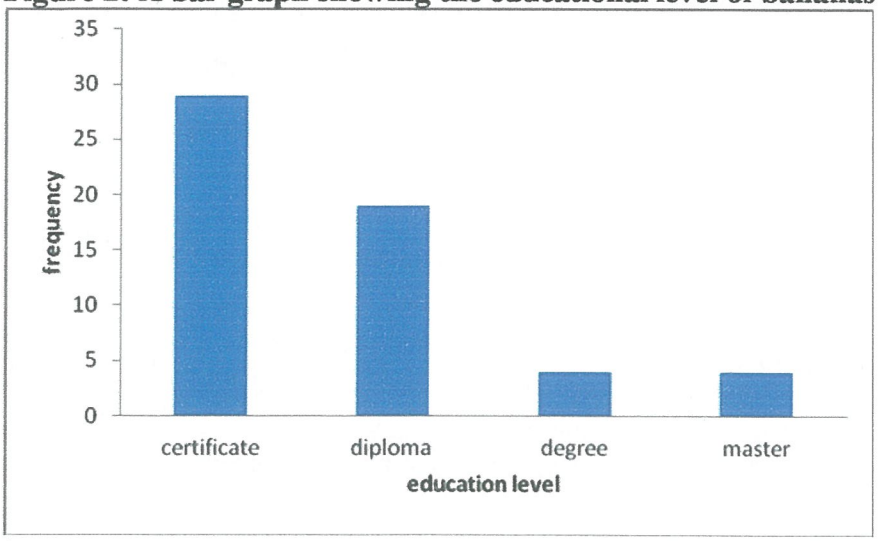
Table 1: showing the age bracket of bananas

	Frequency	Mean	Percent
Below 20 years	27	0.54	54
20-29 years	22	0.44	44
30-39 years	1	0.02	2
Total	50		

Source: Primary Data

Those who are in age below 20 years were 27(54%), 20-29 years (44%) and 30-39years is 1(2%) this implies the major participant in the questionnaire were youth.

Figure 2: A bar graph showing the educational level of bananas growers



Source: Primary Data

Looking at the education level of the respondent in Mukono District, most the participant have the certificate with (29) 58 percent followed by diploma holder (19) 38 percent and the last is degree holder and master implying that few educated people participate in agricultural activities.

Table 2 showing the Cropping system

	Frequency	Mean	Percent
Pure stand	27	0.54	54
Intercropping	23	0.46	46
Total	50		

Source: Primary Data

The cropping system in bananas plantation is commonly pure as can be witness from the table 27(54 percent) mean intercropping 23 (46 percent), this indicates that bananas plantation only do well in pure stand system.

Table 3 showing participation in NAADS

	Frequency	Mean	Percent
No	21	0.42	42
Yes	29	0.58	58
Total	50		

Source: Primary Data

Most of the respondent in Mukono were participant in NAADs (29) 58 percent mean (21) 42 percent of respondent growing bananas were in the members of NAAD.

Table 4 Showing the Change in farming technology

	Frequency	Mean	Percent
No	20	0.4	40
Yes	30	0.6	60
Total	50		

Source: Primary Data

In Mukono District people are able to change with new technology of production the respondent were (30) 60 percent which is so high and those who were not ready to change with the level of technology were (20) 40 percent. Change of technology include use of; fertilizers, tractors, pesticides among others.

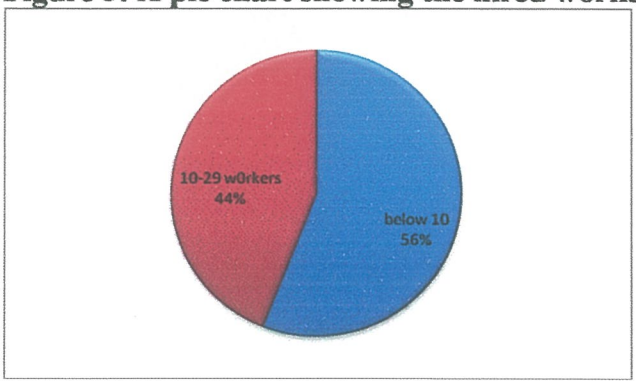
Table 5: showing the Visit by extension workers

	Frequency	Mean	Percent
No	19	0.38	38
Yes	31	0.62	62
Total	50		

Source: Primary Data

Most of the respondents were visited by the service extension (31) 62 percent and those who were not visited by the extension workers were (19) 38 percent.

Figure 3: A pie chart showing the hired workers in the field.



Source: Primary Data

The respondent who hired below 10 workers to work on their plantation were (28) 56 percent and those who hired between 10-29 workers are (22) 44 percent. Indicating that labour directly affect affect production.

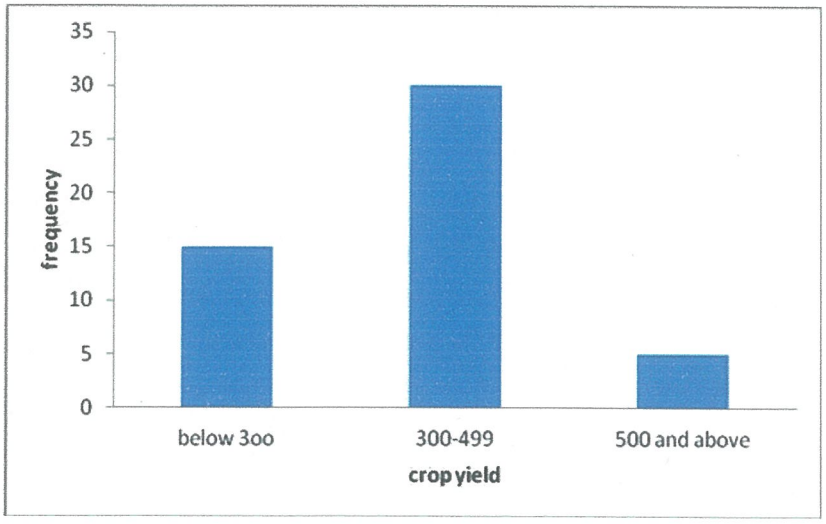
Table 6 showing the land size

	Frequency	Mean	Percent
Below 10	29	0.58	58
10-19	18	0.36	36
20 and above	3	0.06	6
Total	50		

Source: Primary Data

Most of the respondent in Mukono District has 10 hectares of land and below (29) 58 percent followed by 10-19 hectares (18) 36 percent and the minority with 20 and above hectare of land (3) 6 percent as can be seen from the table above

Figure 4: A bar graph showing the bananas yield.



Source: Primary Data

The yield of bananas per hectare of land in mukono District is high as it is portyed by 30 respondent out 50 respondent (60 percent). This could be due to fertile soil ,good climatic condition, improve farmig system among others.

4.1.2 The relationship between Agricultural inputs and households crop production(bananas production) in Mukono District.

Summary of the statisticsof household crop production (bananas crop production in Mukono district)

Table 7 showing Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
GENDER	50	1.58	.50	1	2
AGE	50	1.48	.54	1	3
EDUCATIO	50	1.48	.65	1	4
CROPPING	50	1.46	.50	1	2
PARTNAAD	50	1.58	.50	1	2
TECHNOLY	50	1.60	.49	1	2
VISITEXT	50	1.62	.49	1	2
WORKERS	50	1.44	.50	1	2
LANDSIZE	50	1.48	.61	1	3
CROPYIEL	50	1.80	.61	1	3

Source: Primary Data

To establish the relationship between agricutural input here the resercher use Ananlysis of varinace as can be seen below

Table 8 : showing the Analysis of variance

		Sum of Squares	df	Mean Square	F	Sig.
GENDER	Between Groups	1.460	2	.730	3.108	.054
	Within Groups	11.040	47	.235		
	Total	12.500	49			
AGE	Between Groups	9.460	2	4.730	4.039	.024
	Within Groups	55.040	47	1.171		
	Total	64.500	49			
EDUCATION	Between Groups	15.380	2	7.690	12.048	.000
	Within Groups	30.000	47	.638		
	Total	45.380	49			
CROPSYST	Between Groups	.680	2	.340	1.373	.263
	Within Groups	11.640	47	.248		
	Total	12.320	49			
PARTN NAAD	Between Groups	1.290	2	.645	2.709	.077
	Within Groups	11.190	47	.238		
	Total	12.480	49			
TECHNOLOGY	Between Groups	.810	2	.405	2.647	.081
	Within Groups	7.190	47	.153		
	Total	8.000	49			
EXTENWORKR	Between Groups	.720	2	.360	1.567	.219
	Within Groups	10.800	47	.230		
	Total	11.520	49			
WORKHIRED	Between Groups	16.440	2	8.220	4.981	.011
	Within Groups	77.560	47	1.650		
	Total	94.000	49			
LAND SIZE	Between Groups	7.530	2	3.765	10.294	.000
	Within Groups	17.190	47	.366		
	Total	24.720	49			

From the tabel above it show that education (p=0.000) and land size (p=0.000) ,age (p=0.024), workers hired (p=0.011) all are less than (sig=0.05) we reject the null hypothesis and conclude that there is a relationship between education, land size ,age, and nuber of workers hired and bananas production in Mukono District. This implies that these catergorical variable affect banaas production postively this also confirmed Adetiba(2005) study on education, Sahidu (1974) study on farm size, Ajibefun et al (2002,2006) study on age and Adebayo (2006) study on labour where they found positive relationship in production.

4.1.3 Regression analysis of Agricultural input and household crop production in Mukono District (sig=0.05)

Table 9: Regression analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.854	9	1.539	9.264	.000[a]
	Residual	6.646	40	.166		
	Total	20.500	49			

a. Predictors: (Constant), LANDSIZE, GENDER, WORKER HIRE, EXTENWORER VISIT, CROPPING SYSTEM, PART IN NAAD, AGE, EDUCATION LEVEL, CHANGE TECHNOL' 3Y

b. Dependent Variable: YIELD CROP

Since the (sig=0.000)< sig(0.05) we reject the null hypothesis and conclude that there is arelationship between agricultural input and household crop production in Mukono District.

Coefficients

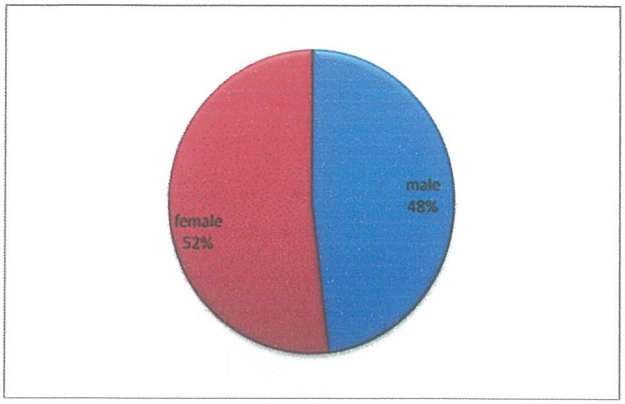
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.742	.672		2.590	.013	.384	3.100
	CROPPING	.324	.183	.269	1.769	.084	-.046	.694
	LANDSIZE	-7.70E-03	.032	-.036	-.238	.0.000	-.342	.058
	WORKERS	-7.09E-02	.193	-.059	-.367	0.011	-.461	.319
	VISITEXT	-.463	.210	-.375	-2.211	.033	-.886	-.040
	TECHNOLY	-2.88E-02	.193	-.024	-.150	.882	-.418	.361
	PARTNAAD	.193	.188	.159	1.027	.310	-.187	.573
	AGE	.304	.194	.273	1.568	.0.024	-.088	2.53
	GENDER	-.163	.192	-.134	-.846	.402	-.551	.226

a. Dependent Variable: CROPYIEL

From the above table , using the analysis of variance ,the stated level of significant is 0.05 and the rejection criteria s reject Ho if sig 0.05>sig 0.000.For this case we reject the null hypothesisis and conclude that there is a relationship between bananas crop yield and its inputs. From the above table land size (sig=0.000), workers hired (sig=0.011), and age(sig=0.024) and less than (sig =0.05) we reject the null hyothesis and conclude that there is a relationship between land size, workers hired, and age with Bananas crop production in Mukono District.

4.1.4 Finding from the background of the respondents who participated in questionnaire process (Maize crop production) Mukono District

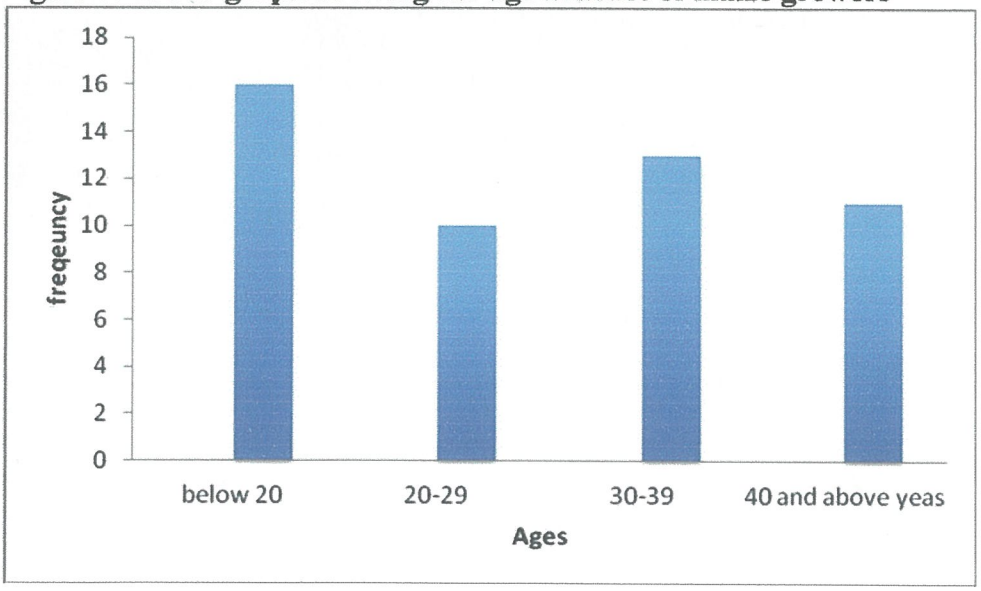
Figure5: A pie chart showing the gender of maize growing respondent.



Source: Primary Data

Most of the women in Mukono were the participant in maize production (26) 52 percent and men were the last (24) 48 percent this might be as result of men leaving their wives to participate in farming activities as for them they do other business.

Figure 6: **A bar graph showing the age bracket of maize growers**



Source: Primary Data

Most of the respondent were in the age of 20 below (16) 32 percent, those in 30-39 years (13) 26 percent, 40 and above (11) 22 percent and the last were those in 20-29 (10) 20 percent indicating that mostly are the youth below 20 participating in maize production.

Table10: Showing the Education level

	Frequency	Mean	Percent
Certificate	24	0.48	48
Diploma	12	0.24	24
Degree	10	0.2	20
master degree	4	0.08	8
Total	50		

Source: Primary Data

Certificate holder were the one leading in maize production (24) 48 percent followed by Diploma holders (12) 24 percent, degree (10) 20 percent, Degree holders (10) 20 percent and lastly master degree were (4) 8 percent.

Table11: Showing the Cropping system

	Frequency	Mean	Percent
pure stand	29	0.58	58
Intercropping	21	0.42	42
Total	50		

Source: Primary Data

Most of the respondents growing maize on pure stand were (29) 58 percent and those who were intercropping maize with other crop were (21) 42 percent. This could be as result of high yield of maize since maize grown on pure stand yield highly than with those grown with other crop.

Table12: Showing the members participation in NAAD

	Frequency	Mean	Percent
No	17	0.34	34
Yes	33	0.66	66
Total	50		

Source: Primary Data

Those who were participating in NAADs were (33) 66 percent wean while who were growing maize but not members of NAADs were (17) 34 percent.

Table 13 : Showing the Change of farming technology

	Frequency	Mean	Percent
No	16	0.32	32
Yes	34	0.68	68
Total	50		

Source: Primary Data

Those who were using modern technique of production were (34) 68 percent mean while those with old technique of production were (16) 32 percent. This has indicated that production has improved.

Table 14: showing the Visitation by extension workers(12 months)

	Frequency	Mean	Percent
No	17	0.34	34
Yes	33	0.66	66
Total	50		

Source: Primary Data

Most of the respondents were visited by extension workers (33) 66 percent and those were not visited by extension workers were few (17) 34 percent, the highest visit by the extension workers indicate that there impartment in knowledge to farmers to improve on their level of production hence promoting productivity.

Table15: Showing the number of workers hired

	Frequency	Mean	Percent
below 10	6	0.12	12
10-19	11	0.22	22
20-29	7	0.14	14
30-39	12	0.24	24
40 and above	14	0.28	28
Total	50		

Source: Primary Data

Respondent who hired 40 workers and above were (14) 28 percent, 30-39 workers were (12) 24 percent 10-19 (11) 22 percent, 20-29 workers were (7) 14 percent and lastly below 10 workers hired in maize production were (6) 12 percent.

Table16 : showing the land size

	Frequency	Mean	Percent
below 10	18	0.36	36
10-19	16	0.32	32
20 and above	16	0.32	32
Total	50		

Source: Primary Data

Respondent who cultivate 10 hectare of land below were (18) 36 percent and 10-19 hectares, 20 and above were 32, 32 respectively. This is an indication that production of maize is high basing on the size of land.

The relationship between Agricultural input and maize crop production (sig=0.05)

Here the researcher used analysis of variance as can be seen below

Table 17: showing the relationship between Agricultural input and maize crop production

		Sum of Squares	Df	Mean Square	F	Sig.
Gender	Between Groups	3.013	2	1.507	7.480	.002
	Within Groups	9.467	47	.201		
	Total	12.480	49			
Age	Between Groups	28.880	2	14.440	18.392	.000
	Within Groups	36.900	47	.785		
	Total	65.780	49			
Education	Between Groups	9.813	2	4.907	5.843	.005
	Within Groups	39.467	47	.840		
	Total	49.280	49			
Cropping system	Between Groups	3.213	2	1.607	8.422	.001
	Within Groups	8.967	47	.191		
	Total	12.180	49			
Participation NAADs	Between Groups	.853	2	.427	1.934	.156
	Within Groups	10.367	47	.221		
	Total	11.220	49			
Change technology	Between Groups	6.080	2	3.040	29.767	.000
	Within Groups	4.800	47	.102		
	Total	10.880	49			
Visit extension work	Between Groups	1.520	2	.760	3.682	.033
	Within Groups	9.700	47	.206		
	Total	11.220	49			
Worker hired	Between Groups	37.453	2	18.727	14.726	.000
	Within Groups	59.767	47	1.272		
	Total	97.220	49			
Size of land	Between Groups	13.653	2	6.827	15.832	.000
	Within Groups	20.267	47	.431		
	Total	33.920	49			

Source: Primary Data

Using the analysis of variance it was fond that size of land (p=0.00),worker hired (p=0.00), visit by extension workers (p=0.033), change in technology (p=0.000), age (p=0.000) education (p=0.0005), cropping system (p=0.001) their probabilities were less than (p=0.05) we reject the null hypothesis and conclude that they have relationship with maize production.

The regression analysis of agricultural input and maize crop production in Mukono District

Here the researcher use regression analysis to establish the relationship between agricultural input and house crop production as can be seen below.

Table 18: showing the Regression analysis agricultural input and maize crop production

odel	Un standardized Coefficients		t	Sig.	95% Confidence Interval for B	
	B	Std. Error			Lower Bound	Upper Bound
;onstant)	4.147	.861	4.818	.000	2.408	5.887
ender	-.035	.183	-.190	.850	-.404	.335
ge	-.136	.105	1.297	.000	-.347	.076
ducation level	-.087	.124	.697	.005	-.338	.165
ropping system	.056	.200	.478	.001	-.459	.348
articipation in NAADS	-.241	.173	-1.393	.171	-.590	.109
hange in technology	.633	.215	-2.948	.005	-1.067	-.199
sit by extension worker	.493	.166	-2.970	.005	-.828	-.157
orker hired	-.023	.103	-.227	.000	-.231	.185
ze of land	.423	.131	3.232	.002	.159	.688

Dependent Variable: Yield of maize

Source: Primary Data

Using the regression analysis the rejection criteria is if (sig=0.05)> (sig computed) reject the null hypothesis which states that agricultural input is not part of the model: age(sig=0.000), education (sig=0.005), cropping system (sig=0.001) change in technology (sig=0.005), visit by extension workers (sig=0.033), workers hired (sig=0.000) and size of land (0.002) all their probability were less than the stated probability (0.05) we reject the null hypothesis and conclude there is relation

between education level ,cropping system, change in technology, visit by extension workers, workers hired , and size of land in production of maize in Mukono District.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1. SUMMARY OF FINDINGS

The main objective of this study was to establish the relationship of agricultural inputs and household crop productivity in Mukono District . For the relationship of each of the input on production of banana and maize, the probability of the t-distribution was used based on a multiple linear regression 5 percent level of significance. The dependent variable and the all the continuous independent variables were found to have relationship. (Age, education, cropping system, change in technology, worker hired and size of land).

5.2. CONCLUSIONS

This study examined the relationship of agricultural inputs and household crop production in Mukono, other factors such as education of farmers, proxy by agro-ecological conditions controlled. The findings of the study include:

Household crop production highly gains from farmers' application of agricultural inputs.

Banana (food-type) production boost is achieved from plots where farmers have used agricultural inputs in relation to the plot. However, there could also be some unobserved factors that play a vital combination role in achieving the increment.

Hired labor (in terms of labor days) on the plots reduces household crop production. It is however, worthwhile to note that this reduction is not significant. The reduction could be due to limited commitment and skills by the hired labourers who in most cases quickly and un-satisfactorily weed, prune, mulch or apply inputs to get quick money.

Household agricultural investment in terms of purchases of inputs such as seeds, fertilizers, manure and pesticides on plots increase household crop production. This is so because most times when farmers opt to purchase inputs, they purchase high yielding inputs like seed and also high quality fertilizers, pesticides and fungicides, which highly contribute to high crop yields.

Although NAADS training is focused on farmer groups rather than individuals, households which have members that are part of the groups and participate in the training, increase their crop production significantly. This is because NAADS training provide directly effective technology transfer mechanism that expose farmers to improved technologies and practices through demonstration centers of farmers.

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Generally, female-headed agricultural households realize boosts in crop production than those of their male counterparts. This could be partly due to the fact that there are more female than male headed households. It could also be due to the issue that females easily assess loan than male and can use them as agricultural loan, which boost crop production in their households.

5.3 RECOMMENDATIONS

Technical improvement characteristics and external persuasion seriously affect the adoption of improved crop practices. Field pests limit crop production, and flexible integrated management packages that combine drought tolerant varieties with improved cultural practices could be adopted as they increase crop yields. Low-cost technologies for controlling crop pests and diseases using cultural practices or environmentally friendly industrial chemicals should also be developed.

The majority of improved varieties are responsive to fertilizer, and farmers usually obtain economic yields with fertilizer or manure. But the use of fertilizer/manure is most times constrained by its high price and farmers' lack of knowledge of fertilizer. An efficient agricultural inputs (fertilizer/manure) awareness system would benefit farmers by teaching them the nitty-gritty of the inputs and reducing the cost of fertilizer/manure. Such a system cannot be established without policy support from the government.

More knowledge on use of organic manure to supplement chemical fertilizer should be given or imparted into farmers. Furthermore, extension efforts should be directed towards promoting the adoption of improved varieties, weeding, and management practices for controlling diseases and field and storage pests. Farmers who intend to store their harvested crops should be advised to treat their stored crops against insect infestation.

The National Agricultural Advisory Services (NAADS) should be guided and supported by the government to; open-up to all districts and sub-counties in Uganda since they currently operate in about 44 out of over 80 districts; make sure that the NAADS demonstration gardens are in easily accessible places for all beneficiaries; open-up to all farmers instead of groups of farmers as this leads to wide spread of knowledge.

Since hired labor does seem to increase household crop production, there is need to think of other types for labor to supplement household member labor on the plot. This could be in form of government revisiting the old system where tractors and ploughs were availed to almost all sub-counties and would be used by farmers at very low cost because of subsidies from government.

Government though Ministry of Gender, Labor and Social Developments (MGLSD) should continue to strengthen women emancipation strategies especially for women farmers to support them in areas like acquisition of low interest agricultural loans to enhance their household crop production. This will help increase production for female headed agricultural households in the country.

5.4. Suggestions for Further Research

The results presented in this dissertation are very not conclusive and should be treated as being preliminary. Further analysis of the survey data (plot and household) needs to be done to validate these findings and provide greater confidence in explaining the changes in livelihood activities in the household crop production.

A study should be carried to establish how the introduction and promotion of Micro Finance Office within MFPED has affected credit accessibility by farmers and the overall effect to use of agricultural inputs/extension services not forgetting household crop. Study of the economics of fertilizer use should be undertaken, especially now that input and output markets have been liberalized.

Extension should be reinforced to increase the flow of information to farmers. Supplementary effort should be directed towards fertilizer technologies, as the bulk of farmers use inefficient practices.

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APPENDICES

APPENDIX I: RESEARCH INSTRUMENT

Dear Sir/ Madam,

Greetings!

I am an under graduate candidate at Kampala International University pursuing a bachelor's Degree in Economics ,currently undertaking a research study entitled **AGRICULTURAL INPUTS ON HOUSEHOLD CROP PRODUCTION (BANANA AND MAIZE) in Mukono District .** In view of this empirical investigation, may I request you to be part of this study by answering my questionnaires, Rest assured that the information you provide shall be kept with utmost confidentiality and will be used for academic purposes only, Please respond to all of the items in the questionnaire and do not leave any item unanswered.

Further, I request to retrieve the questionnaires within five days from the date of distribution.

Yours faithfully,

ABEL SSEGAWA

In signing this document, am giving my consent to be part of the research study of MR. ABEL SSEGAWA that will focus on Agricultural Inputs And Services Extension On Household Crop Production in Uganda (the case of Mukono District).

I shall be assured of privacy, anonymity, and confidentiality and that I will be given the option to refuse participation and the right to withdraw my participation any time.I have been informed that the research is voluntary and that results will be given to me if I ask for it.

Initials _____

Date _____

Section A

Profile Characteristics of the respondents for bananas growing households

Part A

1. **Gender**
   - Male ☐
   - Female ☐
2. **Age**
   - 20-29 years ☐
   - 30-39 years ☐
   - 40-49 years ☐
   - Above 50 years ☐
3. **Education Level**
   - Certificate ☐
   - Diploma ☐
   - Degree ☐
   - Masters ☐

Part B

The categorical variable of the bananas growing house holds

4 Cropping system

Pure stand ☐

Intercropping ☐

5 HH member's participation in NAADS

No ☐

Yes ☐

6 Change of practice with respect to technology in the last 12 months

No ☐

Yes ☐

7 Visit by the extension workers in the last 12 months

No ☐

Yes ☐

8 Number of workers hired

10 below ☐

10-19 ☐

20-29 ☐

30-39 ☐

40 and above ☐

9 Size of land used in hectare

10 below ☐

10-19 ☐

20 above ☐

10 The yield of crop per hectares in cluster.

299 below ☐

300-499 ☐

500 and above ☐

Section B

Profile Characteristics of the respondents for Maize growing households

Part A

1. **Gender**

   Male ☐

   Female ☐

2. **Age**

   Below 20 years ☐

   20 -29 years ☐

   30-39 years ☐

   Above 40 years ☐

3. **Education Level**

   Certificate ☐

   Diploma ☐

   Degree ☐

   Masters ☐

Part B

The categorical variable of the bananas growing house holds

4 Cropping system

Pure stand ☐

Intercropping ☐

5 HH member's participation in NAADS

No ☐

Yes ☐

6 Change of practice with respect to technology in the last 12 months

No ☐

Yes ☐

7 Visit by the extension workers in the last 12 months

No ☐

Yes ☐

8 Number of workers hired

10 below ☐

10-19 ☐

20-29 ☐

30-39 ☐

40 and above ☐

9 Size of land used in hectare

10 below ☐

10-19 ☐

20 above ☐

10 The yield of crop per hectares in kilogram.

500 below ☐

500-900 ☐

1000 and above ☐

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OFFICE OF THE HOD
SCHOOL OF ECONOMICS AND APPLIED STATISTICS

Friday 14th June, 2013

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: INTRODUCTION LETTER FOR MR. SSEGAWA ABEL REG NO. BEC/33847/111/DU TO CONDUCT RESEARCH IN YOUR COMPANY.

This is to introduce to you the above mentioned, a 3rd year 2nd Semester student at Kampala International University pursing a Bachelor of Arts in Economics. He is carrying out a research study on **AGRICULTURAL INPUTS ON HOUSEHOLD CROP PRODUCTIVITY (BANANA AND MAIZE) CASE STUDY: MUKONO DISTRICT.**

You are kindly requested to offer him the necessary assistance especially on Objectives, Methods, Analysis and Findings, he also need information about time, Business ownership. Then this will enable him collect the required data so as to complete him research project.

Any assistance rendered to him will be highly appreciated.

Yours in service,

KAMPALA INTERNATIONAL UNIVERSITY
SCHOOL OF ECONOMICS & APPLIED STATISTICS
14 JUN 2013

Pr. Sempebwa Godwin B.
HOD - School of Economics and Applied Statistics