A STUDY ON SOCIO ECONOMIC IMPACT OF PUBLIC SPENDING ON AGRICULTURE SECTOR: A COMPARATIVE STUDY OF INDIA AND TANZANIA GOVERNMENTS

A Thesis submitted to Gujarat Technological University for the Award of

Doctor of Philosophy

in

Management

by

David Stephen Lwechungura

[139997292002]

Under supervision of

Dr. Shankarrao O. Junare

GUJARAT TECHNOLOGICAL UNIVERSITY

AHMEDABAD

[January – 2018]

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I declare that the thesis entitled **"A study on socio – economic impact of public spending on agriculture sector; a comparative study of India and Tanzania governments"** submitted by me for the degree of Doctor of Philosophy is the record of research work carried out by me during the period from March – 2014 to June - 2017 under the supervision of **Dr. Shankarrao O. Junare, Professor and Dean, Faculty of Management, Gujarat Forensic Science University, Gandhinagar** and this has not formed the basis for the award of any degree, diploma, associate ship, fellowship, titles in this or any other University or other institution of higher learning.

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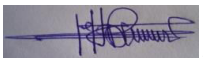
Signature of the Research Scholar: …  … Date: **19th January, 2018**

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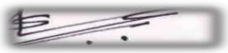
Signature of Supervisor: …  Date: **19th January, 2018**.

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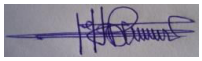
Signature of the Research Scholar: …  … Date: **19th January, 2018.**

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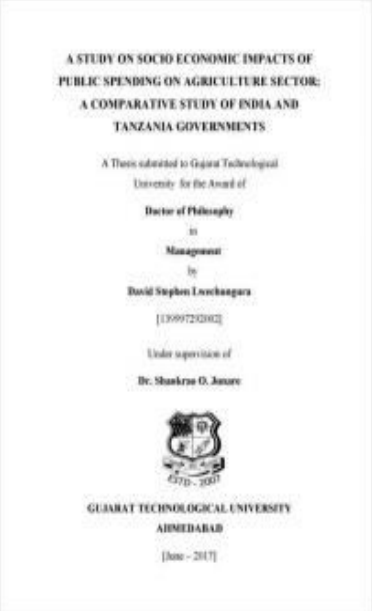

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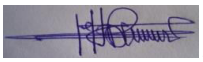
Signature of the Research Scholar: …  … Date: **19th January, 2018**.

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ABSTRACT

Agriculture is among the largest and most important sectors that deserves attentive public investment for economic growth and poverty reduction in terms of shares of GDP, capital and employment creation, food and nutritional security. According to the World Bank the GDP growth originating in agriculture is about four times more effective in reducing poverty than GDP growth of other sectors and it can help reduce poverty for 78 percent of the world's poor, living in rural areas mainly farmers. Agriculture is a crosscutting process incorporating various sub-processes from land tilling up to delivery of farm produce to the final consumer, and so being restrained by vagaries of weather, pests, marketing and infrastructure. The best farm outcomes are expected only if all necessary facilities are in place. Thus, the sector has not developed without comprehensive long term public strategy and investments. Public spending on any sector serves as the instrument for promoting growth and poverty reduction. Research indicates that a ten percent increase in the instability of total government spending on the agricultural sector causes, on average, a 0.36 percent decline in agricultural growth but a one percent change in agricultural expenditure as a share of GDP produces a 0.43 percent reduction in poverty. It is the primary responsibility of the government to ensure general economic growth of the respective country and its individual sectors through public investment. However, agriculture has historically been a low considered in the case study countries with low investment compared to its contributions to the national GDP. The budgetary allocation trends to the sector have remained below 10 percent of total government expenditure. Still such meager resources allocated to the sector have not been managed properly for its effective growth. Instead, it has been used as seepage of public resources for extravagant expenses. Despite their lower hunger indexes score, the number of hungry people is still high and unacceptable. There exists a wide gap between the governments' nominal information about resources injected to the sector, provision of necessary support of essential supplies to stakeholders for sector growth and the real stakeholders' outcry at the respective fields. Unless the respective governments pay attentive consideration to the sector from funding to proper management of such funds and other resources, it may take some decades for the sector stakeholders to realize the economic benefits from public investment to the sector. There should be a fine bond between the public and private sectors with clear policies with minimum restrictions, taxes and rules to cheer private stakeholders to invest into the sector.

Acknowledgement

I am grateful to our Almighty Living GOD of heaven for His mercy up to this moment and for enabling me and all other stakeholders who were involved into my research in either way to accomplished it. I will keep on praising and worshiping HIM (Deuteronomy 8:11-20).

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Indeed it is very difficult to mention everyone who assisted me in one way or another, I deeply feel so compelled to thank all whom I did not mention but I owe a lot for their help during this study.

Dedication

I dedicate this research thesis to my sister and colleague staff Mrs Tegemea Benson Mwangomale as an acknowledgement of her moral and material support from the preparatory stages up to this stage of submission of the thesis. Mrs Benson is the only person who was fully involved from the study plan, application processes and she has been vigorous throughout the whole period of my studies. May our almighty God bless her, her whole family and crown all her precious intellectual efforts. Amen. ***(1Thesolonians 5:12-15 and 2 Corinthians 9:8).***

David Stephen Lwechungura.
Gujarat Technological University

Table of Contents

List of Abbreviations

ACD	Agricultural Credit Department
AICL	Agriculture Insurance Company Limited
ALP	Agriculture and Livestock Policy
ANSAF	Agricultural Non State Actors Forum
APEDA	Agricultural and Processed Food Products Export Development Agency
APMC	Agricultural Produce Market Committee
ARDC	Agricultural Refinance and Development Corporation
ASDP	Agricultural Sector Development Programme
ASDS	Agricultural Sector Development Strategy
BRN	Big Results Now
CAADP	Comprehensive Africa Agriculture Development Programme
CCIS	Comprehensive Crop Insurance Scheme
CDP	Cooperative Development Policy
COFOG	Classification of the functions of government
CRDB	Cooperative Rural Development Bank
CWC	Central Warehousing Corporation
DMI	Directorate of Marketing and Inspection
FANRPAN	Food, Agriculture and Natural Resources Policy Analysis Network
FAO	Food and $^{\text{Agriculture}}$ Organization of the United Nations
FIIS	Farm Income Insurance Scheme
FIMI	Food Insecurity Multidimensional Index
GDP	Gross Domestic Product
GHI	Global Hunger Index
GIBNA	General Insurance Business Nationalization Act
GIC	General Insurance Corporation of India
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOI	Government of India
ICAR	Indian Council of Agricultural Research
IFA	International Fertilizer Association
IFAD	International Fund for Agricultural Development

IFDC	International Fertilizer Development Center
IFMIS	Integrated Fertilizer Management Information System
IFPRI	International Food Policy Research Institute
IT	Information Technology
MDG	Millennium Development Goals
MoUD	Ministry of Urban Development of India
NABARD	National Bank for Agriculture and Rural Development
NAFED	National Agricultural Cooperative Marketing Federation
NAIS	National Agricultural Insurance Scheme
NAP	National Agricultural Policy
NBC	National bank of Commerce
NEPAD	New Partnership for Africa's Development
NIC	National Insurance Corporation
NIDA	NABARD Infrastructure Development Assistance
NMB	National Microfinance Bank
NSGRP	National Strategy for Growth and Reduction of Poverty
NSSO	National Sample Survey Office
OECD	Organization for Economic Co-operation and Development
PE	Personal Emoluments
PHL	Post Harvest Losses
PSSCI	Pilot Scheme on Seed Crop Insurance
RAL	Regional Agmark Laboratories
RDP	Rural Development Policy
RFBK	Rashtriya Fasal Bima Karyakram
RISC	Rainfall Insurance Scheme for Coffee Growers
RKBY	Rashtriya Krishi Bima Yojana
RPCC	Rural Planning and Credit Cell
SAGCOT	Southern Agriculture Growth Corridor of Tanzania
SBI	State Bank of India
SFAC	Small Farmers Agri-Business Consortium
SFSA	Foundation for Sustainable Agriculture
SLB	Service Level Benchmarking

SSA	Sub-Saharan Africa
T sector	Trade, transport, banking and business service sector
TADB	Tanzania Agricultural Development Bank
TAFSIP	Tanzania Food Security Investment Plan
TFIFED	Tribal Cooperative Marketing Federation
TGNP	Tanzanian Gender Networking Program
TIB	Tanzania Investment Bank
TIRA	Tanzania Insurance Regulatory Authority
TMP	Tanzania Markets Pan
UN	United Nations
URT	United Republic of Tanzania
US	United States
WB	World Bank
WBCIS	Weather Based Crop Insurance Scheme
WSSA	Water Supply and Sewerage Authority

List of Figures

List of Tables

List of Appendices

CHAPTER - 1

Introduction

1.1 General Introduction

There have been economic policy debates on how much should governments spend, on what, and for what. The individual sectors and national economic growth and sustainable development are crosscutting processes that involve a multiplicity of resources viz. financial, human - for technical consultancy services and materials (supplies and equipment) all of which need to be secured for the interest of viable development accomplishment of a state or national as a whole. The same applies to individual sectors, and for this particular study we consider agriculture sector. Agriculture is among other most important sectors for sustainable development, economic growth and poverty reduction in most of the developing countries including the case study countries. It is the largest sector in terms of shares of GDP, employment creation, food and nutritional security and economic growth respectively. Majorities of the world's poor live in rural areas and depend on the sector for their livelihood. Sustainable agricultural development is therefore very important in the quest for economic growth and sustainable development. We need collective strategic efforts and mechanisms by respective governments in place to promote the sector and its allied activities. This can be achieved through effective public spending.

Different researches have reported a linkage between government spending and agricultural growth and poverty reduction thus, government spending contributed to both agricultural production growth and poverty reduction. According to World Bank (2008), the GDP growth originating in agriculture is about four times more effective in reducing poverty than GDP growth of other sectors.

Agriculture is a crosscutting process that incorporates various sub-processes or steps from land tilling up to delivery of farm produce to the final consumer. Being such a long process, it demands both physical and human resources for the best outcome. These resources vary depending on the stage of the process, type of crops and geographical nature of the region involved respectively although most are common. With all factors remaining unchanged, supply of all necessary resources for crop farming should be a streamlined one. Land is the most important resource for any person intending to implement crop farming and any other allied activities. Here we expect farmers to be assisted by respective authorities in all land related issues such as land acquisition, land survey, control and management. However, it has been a very hard-hitting issue in almost all developing countries including the case study countries. The best farm outcome is only expected if all of necessary factor or facilities will be appropriately and adequately supplied to a particular farmer. Starting with seeds required, not all seeds are eligible for better crop yielding; – they should be certified high yielding ones. But having certified high yielding seeds only is not enough. This should be complemented with relevant agrochemicals – fertilizers and pesticides as they help farmer to get both high quality and quantity of produce. Farm mechanization is another important aspect for profitable farming. Agriculture mechanization refers to use of all kind of relevant machines – tractors and/or power tillers for land tilling, sowing or planting, weeding, harvesting, processing and distribution equipments without forgetting irrigation facilities to make farming most cost effective but more profitable. Most of the agricultural produce are seasonal. They therefore need to be processed and stored for being released after the harvest season. This will not only ensure food and nutrition security but also promotion of high level of income to farmers upon sale of their produce. This then demands more resources and structural infrastructure, storage and pre cooling facilities. Both stable and reliable electric power and adequate water assume a very important role at this stage. Nevertheless, water and land are among other few resources which are expected to take a full participation throughout the entire farming process. Availability of marketing infrastructure together with appropriate and adequate marketing information is very important to farmers for vending their produce on cost-effective way as they will be able to decide what to sell here and when. This is always complemented by adequate transportation infrastructure starting with farm roads for

easily ferrying of both farm inputs to the farm yard and farm produce from the farm yard to nearby markets while permanent tar marked roads facilitate easily transportation of the produce within the respect country and/or exportation. Research indicates that in most of the agro-climatically homogeneous regions, villages that have asphalted approach roads have always experienced higher growth and development compared to those that do not have such facilities. Agriculture is the riskiest endeavor among the major economic activities, especially in developing countries, due to high and difficult-to-predict weather fluctuations, great vacillation in prices driven by global market conditions, and the occurrence of often sudden and dramatic natural shocks such as those caused by plant and animal diseases and pests This necessitates the need of protection to farmers from these calamities to ensure their food security, income flow and credit eligibility for the future seasons, i.e. agriculture insurance as one of the risk transfer measures and an important instrument in the strategy of risk management. All these activities can only be done effectively upon availability of adequate financial facilities. It is true that almost every activity under this world would only be done successfully upon availability of an essential resource –fund or finance or money. Finance is required by both producers and consumers in both rural and urban areas for their daily prerequisites and productive activities. When it is not sufficient, one needs to seek loan or credit. Credits requirements are more pressing in rural population particularly agricultural producers and tenants cultivators most of whom do not earn sufficient funds to meet even the minimum requirement of their life. To save this huge group and the entire agricultural stakeholders' lineup we need agricultural subsidized financial institutions in place to provide financial services such as soft loans and credits for their sustainable existence. It is clear that among the factors mentioned above, only a few can be met by individual farmers or peasants but the rest remain unattainable as they demand huge amount of investment hence collective strategies and initiatives becomes a must to facilitate their acquisition.

1.2 Rationale of the study

About 99 percent of the world's population cannot pass a single day without consuming at least one agricultural related product be it directly or indirect in their normal daily activities. The agriculture sector plays a fundamental role of sustaining the majority of the world's rural population livelihood through provision of their basics – foodstuff, income and employment

which in turn stimulate the economic growth, poverty reduction and improve food and nutrition security not only to individual countries but globally. About 75 to 85 percent of populations in most of developing countries live in rural areas. It is considered as the major source of investment creation which is essential for economic growth of any country. According to the World Bank (2007) as quoted by Cleaver (2013), investment in agriculture is 2.5 to 3 times more effective in increasing the income of the poor than is non-agricultural investment. Research indicates that agriculture is a multiplicity factor into capital formation for economic growth through three major ways: (i) increasing agricultural productivity which leads to lower food prices that in turn raises real income and promotes saving; (ii) increasing farm produce which then generate higher levels of farm income part of which may be saved for investment purposes; and, (iii) generation of capital by taxing agricultural sector related transactions. It is therefore important to both agriculture - based non agriculture - based economy countries. In agriculture based economy countries it assumes a great role into their GDPs. Several research show agriculture contributes an average of about 28 to 30 percent of their national GDP leaving the rest 70 percent being shared among other sectors. It also provides employment to their population – about 60 to 80 percent through farming and its allied activities. Most of the manufacturing industries (e.g. gametes, cigarette, furniture, tires, papers, medicines and medical equipment, etc) depend mostly on the sector for their raw materials. Research shows about 38 percent of all commodity inputs for manufacturing industries are originated from agriculture sector. On the other hand modern farming demand advanced farming equipments and goods viz. farming kits, processing and packaging machines and distribution equipments and agrochemicals – fertilizers and pesticides all of which come from manufacturing industries. It therefore provides a reliable market of industrial products. Agriculture is one among the major catalysts for industrial development. According to Reddy (2012), agriculture sector contributes to industrial development by way of: (i) providing food to the growing industrial workers; (ii) providing raw materials to industrial development of both large and small scale industries; (iii) providing labor to the industry; (iv) providing demand for industrial products; and, (v) helping capital formation required for industrial development. In simple words, agriculture and industry are intertwined and complementary factors for economic development. They both compete for the national resources but complement to each other for the national economic growth. While the

agriculture sector accelerates the industrial growth and stability, the later facilitates modernization and high yielding of the former. They both create input to each other as well as markets of produce from each other.

However, agriculture sector has historically received less attention from most of the developing countries in terms of public investment which is regarded as an important function in pursuing the sector and general economic growth objectives. In view of this the researcher decided to assess the relationship between the two parameters agriculture sector and the public investment through a comparative case study within two countries India and Tanzania respectively.

Both of the case study countries are termed as the developing countries and share some common aspects in relation to agriculture including:

(i) Both are agricultural based economy countries with the sector providing employment to about 70 – 80 percent of their work forces respectively

(ii) Agriculture is the main source of livelihood to their rural population with about 65 to 80 percent of their rural poor living in rural areas and depending on the sector for their livelihood through: (i) Provision of subsistence (food, nutrition) to over 2/3 of the workforce; (ii)Local income generation; and (iii) Foreign exchange

(iii) The sector is the main source of raw materials to manufacturing industries within both countries with more than 38 percent of all commodity inputs to manufacturing industries coming from agriculture.

(iv) Agriculture is the largest sector within the countries with high percentage of contribution to their GDP (about 28 – 30 percent)

(v) Most of their areas receive at least one rainy season a year, and they share some climatic (tropical) conditions

(vi) They all grow some common crops for both food grains and cash (coffee, cotton, rice, wheat, banana, potatoes, onions, sugar cane, ginger, tea, tomatoes, etc).

(vii) Customary land ownership laws and average agricultural land sizes owned by smallholder agriculturalists within both countries are nearly equal.

(viii) Government behaviors on financing the sector have relatively been almost the same for the last ten years

1.3 Purpose of the study

This research was conducted within public endeavors of the governments of Tanzania and India to gain an understanding of the relationship between the government spending on public responsibilities and the value of the resulting benefits. The main purpose of the research was to assess the socio economic benefits resulting from public spending on the agriculture sector by the governments of the two case study countries. It aimed to assess the expenditure trends by the governments of the case study countries for the last ten years on the sector and the impacts thereon for both social and economical arena. This could enable me to put recommendation to the governments under the study to steer a positive path towards promoting the sector for effective growth and poverty eradication through public spending.

It was designed as a comparative case study that eased endeavor of an in-depth understanding of the relation between the government's spending on the sector and the benefits in connection to the economy and other social matters. Comparisons were made between the importance of the sector on one side and level of consideration, the trend of funding the sector and a qualitative and quantitative discernment over the manner in which the resources involved have been utilized and managed.

1.4 Statement of the problems and research questions

Agriculture is among the largest and most important sectors for economic growth and poverty reduction in terms of shares of GDP, capital and employment creation, food and nutritional security. However, it has historically been less considered by respective governments and a few out of several previous studies could consider the outcomes resulting from injecting public resources to agriculture sector and/or the consequences of the converse. Having experienced such a wide gap, the researcher thought it is a high time to undertake relevant study to gain an insight of the social and economic benefits resulting from public investment on agriculture sector. The researcher then decided to develop a comparative case study to assess the socio economic advantages from public investment to agriculture sector by the governments of the two countries of India and Tanzania by considering the important indicators relevant to the growth of the sector which in turn guides the growth of their economy. This will be followed by suggestions and recommendations for improving all noted anomalies for effective measures to improve individual living standards especially the

rural poor whose livelihood depend on the sector. The following research questions were the clicking questions

Research questions

1. Is there any relationship between the public investment on agriculture sector and the relevant contribution of the sector to the economic growth of the respective country?
2. What are the socio economic benefits resulting from injection of public resources to agriculture sector by the respective government?
3. What are the role and responsibilities of government on agricultural development?
4. Does the government exert proper management of public resources allocated to the sector?
5. What were the trends of disbursements of budgeted and approved funds to the agriculture sector from central government in each country?
6. What were the trends of budget allocation to agriculture sector and the current percentage of agriculture funding as a portion of total annual budget?
7. Were the trends of public investment to the sector considering its respective contributions to the national GDPs?
8. Does the government support agricultural stakeholders by providing all necessary aspects in all steps of crop farming cycle until the farm produce reaches the final consumer?
9. Were agricultural stakeholders satisfied with government support to promote the sector growth and improve their economy through farming?
10. What are the problems faced by respective countries in agricultural public investment?
11. What is the way forward to for improving for agriculture sector growth through public spending?

1.5 Significance of the Study

Among many others, the following are expected rewards of this study: (i) identification and disclosure of direct relationship between public spending and agriculture sector on one side and rural development on the other side, (ii) enforcement of value for money on public

spending, (iii) emphasise of transparency, accountability and equity in public spending, (iv) government priorities for public investment and actual expenditure on the sector and food security-related expenses will be known, (v) highlighting the public spending trends on agriculture compared to the size and contribution of the sector the national GDP, (vi) disclosure of the difficulties and problems faced by the respective governments in public spending on agriculture particularly, (vii) enforcement of improved public spending through basic social services provision in rural areas.

1.6 Thesis structure

This thesis presents the results of findings of a study carried out within two case study countries – from seven (7) regions in Tanzania and two (2) states in India. The study sought to evaluate the general economic advantages (expected) resulting from public investment on agriculture, trends of investment to the sector and the actual situation with the respective governments of the case study countries. Findings are based on 1,320 respondents - 660 from each of the case study countries respectively. The first chapter is about a general introduction of the study, the second chapter is an overview of the topic based on both secondary data from respective case study countries and other reliable global sources. The literature survey, from which different previous and current relevant studies were reviewed with an intention to gather relevant facts and conclusions from other academicians and intellectuals, is in chapter three. Procedures and methods of conducting the research are explained in the fourth chapter. The fifth chapter is about data analysis and interpretation and the sixth chapter presents the results of the study followed by recommendations and conclusions.

CHAPTER - 2

An Overview of Public Spending, Agriculture Sector and their Relationships

2.1 Introduction

Both agriculture and public spending are important aspects for sustainable development, economic growth and poverty reduction for most of the developing countries. However, there is a direct dependence between these two factors in relation to the economic development. Agriculture is a dependent variable to public spending for the achievement of the economic growth and poverty reduction.

Public spending is considered as one of the most effective instruments of the governments in the efforts to promote agricultural growth and poverty reduction that can bring direct outcomes. This should be complemented by other factors such as adequate information - about which types of public investments contribute the most to development goals. In most cases public resources are limited with competing demands. For a person, institute or a nation to analytically plan and or decide how scarce resources should be allocated across different sectors of the economy such as agriculture, infrastructure, health, and education for maximizing development outcomes, or within a sector how should resources be distributed by priorities research and development (R&D) need to be in place.

2.2 Meaning of public spending

In simple terms, the term spending refers to the act of using, paying out or disbursing money. The term expenditure refers to the act of paying out money for acquiring respective goods or service or the act of consuming something (not necessarily money).

Based on such basic meaning, the following are the meaning or definitions of public or government spending as were made by different intellectuals: According to Wikipedia, the free encyclopedia public expenditure (also known as Government spending) is that spending made by the government of a country on collective needs and wants such as pension, provision, infrastructure, social services etc. It includes all government consumption, investment, and transfer payments. In national income accounting the acquisition of goods and services for current use by the governments to directly satisfy the individual or collective needs of the community, is classed as government final consumption expenditure. Government acquisition of goods and services intended to create future benefits, such as infrastructure investment or research spending, is classed as government investment (government gross capital formation). These two types of government spending, on final consumption and on gross capital formation, together constitute one of the major components of gross domestic product.

The Business Dictionary defines it as the money expended by a government to pay for defense, development projects, education, health, infrastructure, law and order maintenance, etc. The major financier of public spending is by taxation. The wise geek, (clear answers for common questions) describes Government expenditure as a term used to describe money that a government spends to meet collective demand of their citizen. Gaurav Akrani, (2011) defined public expenditure as the expenditure incurred by public authorities like central, state and local governments to satisfy the collective social wants of the people of their people.

Public expenditure occurs at different levels of government, from local municipalities or city councils to federal organizations to meet several different types of government expenditure, including the purchase and provision of goods and services, investments, and money transfers. They are therefore classified on the basis of functions for which they are incurred. Nonetheless, to date there are two major and formal types or classes of public expenditure namely revenue and capital public expenditure respectively. Revenue expenditures also known as current/recurrent or consumption expenditures are those incurred on civil

administration, defense forces, public health and education, maintenance of government machinery, etc. This type of expenditure is of recurring type which is incurred year after year. Examples include the creation and maintenance of the military, police, emergency, firefighting organizations and programs such as health care and food stamps. They are all funded by federal and regional governments for provision of respective services to citizens. On the other hand, capital also known as development expenditures are those incurred on acquisition or building of durable assets, like highways, multipurpose dams, irrigation projects, machinery and equipment. They are non recurring type of expenditures in the form of capital investments. Such expenditures are expected to improve the productive capacity of the respective country's economy.

Policy makers and analysts have divided government expenditure into two main categories - capital or development and recurrent spending to predict the growth effects of public funding on any sector. While the recurrent expenses are mainly for Personnel Emoluments (PE) and all other sundry expenses incurred on daily operations activities (final consumption expenditure), the development costs are intended for future benefits and consist of real investment in the respective sector and it is expected to directly impact on sectoral interventions thereby affecting the general economic growth of the state and individual community's lives. However, according to OECD and UN, social and economical factors on which government spends are grouped according to the classification of the functions of government (COFOG): social protection, health, education and culture, defense, public order and safety, economic affairs, environmental protection, housing and community amenities and general public services. With this arrangement, public investment is therefore classified into three main levels; divisions - describing the broad objectives of government and, groups and classes - both defining the means by which these broad objectives are achieved. Major sectors like agriculture, education, public infrastructure, research and development, and health which have long-run effects on the country's economy are expected to be highly considered in such distribution of the meager public resources. But COFOG allows for a general classification of spending on a variety of functions that is presented in different ways in the budgets of different national and sub national entities to ease implementations and comparisons. To identify sectors or streams that need critical resources allocation,

policymakers should have clear analysis of various forms of public investment efficiency for enabling them to make correct policies pertinent to public investment. Nevertheless, priorities of public investment in agriculture differ from one country or state to another depending on the political governance that has consistently observed to be the key manipulation factor for the composition of public spending.

2.3 Importance of public spending

Public spending serves an important function in pursuing economic growth objectives while ensuring that gains are widely distributed to promote broad-based increases in living standards (Dewan and Hettinger 2009). Flourishing or slouching of an individual sector depends mainly on how it is being weighted by the respective government in the context of public spending. For example agriculture growth and poverty reduction depend on public spending for their better performance. Research indicates that public spending has not only high potential but also direct and effective impacts in cause of promoting agricultural growth and poverty reduction. When the classification of the functions of government (COFOG) is considered as the working tool for public investment, a balanced economic growth is expected. It can promote growth by financing essential public services, such as security, infrastructure, health and education.

2.4 Social and economical factors deciding governments spending

Various types of government spending have different impacts on economic growth, implying greater potential to improve efficiency of government spending by reallocation respective resources among sectors. Social and economical factors on which governments spend are grouped according to the classification of the functions of government (COFOG) to be used for expenditure on a variety of government functions viz. (i) social protection; (ii) health; (iii) education and culture; (iv) defense; (v) public order and safety; (vi) economic affairs; (vii) environmental protection; (viii) housing and community amenities; and (ix) general public services. But COFOG is flexible for a wide-ranging classification of spending on a variety of functions that is presented in different ways in the budgets of different national and sub national entities to ease implementations and comparisons. Among these social factors, some considered to be of more important as compared to others. They include (i) agriculture;

(ii) education; (iii) health; and, (iv) infrastructural spending. These factors contribute strongly to sustainable economical growth of a respective government. This was supported by Zagler and Dürnecker (2003). They found that fiscal policy instruments such as government spending on education, public infrastructure, research and development, and health have long-run effects on the country's economy.

2.5 Discussion of key deciding factors

2.5.1 Agricultural Spending

Both agricultural growth and poverty reduction depend mainly on public spending for their guaranteed episode. According to Fan et al (2009) public spending is one of the most direct and effective tools that governments can use to promote agricultural growth and poverty reduction. Agricultural spending generally has the prime and positive effects on economic growth and poverty reduction. In many cases government agricultural spending has contributed substantially to agricultural productivity, rural household income, rural household consumption, and rural poverty reduction. Research has proved a positive correlation between government or public spending and agriculture development as one among other economic growth factors and poverty alleviation in rural areas of developing countries. Most of the studies found that government spending contributed to agricultural production growth and poverty reduction, but different types of spending may have different effects on economic growth and poverty reduction. In recognition of such importance, the New Partnership for Africa's Development (NEPAD) through Comprehensive Africa Agriculture Development Programme (CAADP) decided to set the goal of 6 percent annual agricultural growth to be met by the member countries by allocating respective resources from their annual public spending to the sector. In implementing this, many Sub-Saharan African countries have pledged to increase government support to the sector. It was then officially decided during the Maputo Declaration of 2003 by the African heads of state. They agreed to allocate 10 percent of their national budgets to agriculture to promote its growth and alleviate rural poverty. Yet only a few states have met these growth and spending targets with gradual annual increase rate to date.

To determines how the government considers the sector through public investment relative to the size of the sector we need to think about agriculture expenditure as a percentage of agriculture GDP. Further, an insight should be focused on agricultural research and development (R&D) within the sector itself. R&D is a fundamental aspect for agricultural growth and food production. Historically, agricultural spending as a percentage of agricultural GDP has been extremely low leading into a less consideration of R&D within developing countries in contrast to developed countries respectively. This was supported by Fan and Saurkar (2012). According to Fan and Saurkar for the period of 22 years up to 2002, the average agriculture expenditure relative to agricultural GDP in developed countries has generally been ranging above 20 percent, compared to developing countries where it has always been below 10 percent. In Africa, agriculture expenditure as a percentage of agricultural GDP remained relatively low between 5.4 and 7.4 percent slightly lower than that for Asia which remained constant at between 8.5 and 10.5 percent throughout the same period. In the year 2000, the share of agricultural R&D expenditure in agricultural GDP in Africa and Asia was relatively low between 0.5–0.9 percent and 0.98 percent in Latin America compared to 2–3 percent in developed countries.

Generally, the annual growth of government spending on agriculture within the case study countries has increased but at a very low pace of less than 5 percent. According to Fan and Saurkar (2012), while African government expenditure on agriculture has increased at an annual growth of 2.5 percent during the period between 1980 and 2002, it was more than doubled in Asia with an annual growth rate of 4.4 percent. One among factors factor leading to such situation was scarce public resources. This situation demands existence of balanced public expenditure policies to avoid inequalities in income distribution and accelerates economic growth and promotes employment opportunities and reducing poverty.

2.5.2 Infrastructure spending

The Oxford Dictionary defines infrastructure as the basic systems and services that are necessary for a country or an organization to run smoothly, for example buildings, transport and water and power supplies. Generally it means the set of interconnected structural element which provides a framework supporting an entire structure of development such as roads,

telecommunications, bridges, water supply, sewers, electrical grids, etc. it is an important term for judging a county or region's development. Viewed functionally, it facilitates production of goods and services and distribution of finished goods to the markets as well as basic social services such as schools, hospitals and farm inputs.

Government spending on rural roads has had great positive impacts on growth and poverty reduction. However, in most of the developing countries, the sector has not done well compared to developed countries. Governments have devoted a low share of spending to infrastructure. In Sub Saharan African countries the sector has even been getting worst from time to time. In Tanzania for example, at least 3 to 4 hours of a working day are being lost on road traffic jams and it is approximated that about $1.6 billion is being lost daily because of road traffic jams and poor infrastructure. One planning to budge from Mbezi Mwisho to New Post Office at the Dar es Salaam City Center – a 15km distance has to consider starting his trip at least 3 hours before the normal time budget otherwise he will be missing all of his appointments. According to Fan, Mogues, and Benin (2009) African governments have devoted a low share of spending to infrastructure, particularly transportation and communication, which gradually declined from 6.3 percent in 1980 to 3.7 percent in 2005. Supply of both stable electric power and clean and safe tape water to both urban and rural areas is another tough nut to be cracked by the government despite the varsity of natural resources surrounding the country. Notwithstanding of the instability of electric power supply its tariffs have remained high with an average of $12.6 cents per kWh. These price hikes for electricity energy pose a threat not only on inflation but also more deforestation within the country. It is discouraging because investments in transportation, electricity power supply and telecommunication, contribute immensely to growth and poverty reduction, but still such infrastructure development has remained poor. The situation is different in India. It is the second country in the world with largest road network. However, these sounds like nominal statistics. A commendable road network should incorporate marginal rural areas for easing supply of their basic requirements and in turn delivery of their farm produces to their nearby local markets. Most of rural areas especially farm yards are not connected with such road network. Road connection among villages has not been easy as one can imagine. Feeder roads and farm roads also known as pucca are not official and passable

throughout the year the situation that has been causing hardship to farmers on both ferrying farming inputs to their respective farm yard and in turn their farm produce to the nearby local markets.

2.5.3 Educational Spending

Spending on education also has significant effects on economical growth and poverty reduction by raising labor productivity both on and off the farm, boosting wages and incomes. Studies indicate that public spending in education increases the level of human capital, which contributes to the knowledge-based economy and hence economic growth. It is probably easy for skilled farmers to adopt and even to plead with other farmers to adopt improved agricultural technologies for better agricultural productivity. This in turn will pose a positive impact on sustainable use and management of natural resources and environment preservation as well. The education aspect should cut transversely to all development stakeholders including those dealing with resources management. According to IFPRI (2006) increasing spending on agriculture must be complemented with adequate knowledge about how resources can be efficiently allocated among competing development priorities. In other words, it is not only about quantity, but also about quality and proper placement of resources. Nonetheless, the growth returns to spending on rural education in many developing regions have not been easy and viable. For instance in Tanzania, the current formal education system has not benefited the poor rural and the agricultural sector there because better-educated and skilled personnel tend to move away from farms and villages, leaving the less skilled in the agricultural sector and other sectors – education and health without respective professionals. The underlying reasons are poor infrastructure and social services in the rural areas. In most cases schools situated closer to district centers have higher teacher to pupil ratios and had a better supply of school books vis-à-vis those situated interior where current electricity, tape water, staff houses, telecommunications, transportation and financial services are limited. As a result a teacher stationed at one of the rural area schools has to spear at least two days to go for his monthly salary at the nearby township. Further, supply of necessary teaching materials - text books, classrooms, desks and teachers' houses in most of rural area schools is limited.

2.5.4 Health Spending

It is clear that good health of citizens has directly relationship with both economical growth and poverty reduction. Healthy people are able to participate on productivity or income generating activities. In other words the economic prosperity of a nation is pivoted on a healthy population whose social welfare is being cared in best possible ways at all levels. Nonetheless, medical services have predominantly been poor in most of the developing countries particularly in rural areas where the rate of death of pregnant women during delivery and child mortality have remained high compared to other developed regions. The underlying reasons are almost the same like in other sectors viz. poor quality medical services and lack of other related facilities such as preventive and rehabilitative, and rehabilitation of health facilities, standard staff housing, training and recruiting and retaining all medical doctors, nurses and paramedical graduates at all vicinity within their countries through attractive remuneration.

2.5.5 Public spending on Water sector

The water sector lays a hand on all the spheres of human life including: domestic, livestock, fisheries, wildlife, industry and energy, recreation and other social – economic activities. The availability of safe and clean water raises the standard of living while the inadequacy of it poses serious health risks and leads to the decline in the living standards and life expectancy. However, public spending on this sector has been narrowed for some times in most of the developing regions. In Tanzania for example, share of water sector budget in the total government budget declined slightly from 3.6 percent in 2009/2010 to 3.3 percent in 2010/2011. According to Tanzania National Website, water-borne, water-related and water-washed diseases embrace over a half of the diseases affecting the population. According to the Tanzanian Gender Networking Program (TGNP), lack of safe, sufficient, and affordable water is one among other factors which had increased rates of gender-based violence and the number of girls dropping out of school. Estimates for 2012 by GIZ suggest that 74 to 90 percent of population in most of large and small urban settlements in Tanzania live in Low-Income Areas out of which only 23 percent of such population receives its drinking water from a public (licensed) service provider (WSSA). In India the situation is almost the same. Although access to drinking water has improved; estimates by the World Bank suggest that

about 21 percent of communicable diseases in the country are related to consumption of contaminated water. Diarrhea alone for example, is estimated to cause more than 1,600 deaths daily within the country. In most community and/or cities the time for supply of tape water from a public (licensed) service provider is still as low as less than half an hour per day. Studies by the Ministry of Urban Development (MoUD) under the Service Level Benchmarking (SLB) in 2006 within 28 cities and the Asian Development Bank in 2007 within 20 cities indicate that average duration of supply was only 3.3 and 4.3 hours per day respectively. None of the 48 cities (for both studies) had continuous water supply.

All these five sectors (agriculture, education, health, infrastructure and water) are interrelated and interdependent to each other although they all compete for the national resources of the respective government through public investment. They all have great impact on both economic growth and poverty reduction. With this regard we need existence of balanced public expenditure policies to avoid inequalities in income distribution by prioritization, control, and proper management of spending across different sectors, within a particular sector, and across different geographic jurisdictions for enhanced economic growth and poverty reduction. This starts from rational budgeting, early disbursement funds and allocation of respective resources together with appropriate management. However, allocating fund and other resources to a particular sector is one aspect and having them exploited or implemented for effective outcomes as planned is another. An effective public spending should be in line with five principles which are value for money, transparency, accountability, openness and equity.

2.6 Reasons of government spending on agriculture

Agricultural spending generally has the highest positive effects on growth and poverty reduction. Several studies (Desai 2012; Mashindano et al. 2011; World Bank 2015; Singh 2011; and Kulakarni 2013) have categorized the sector as the major factor for development – particularly in the developing countries through different ways. In many cases government spending on agriculture has contributed substantially to employment, agricultural productivity, rural household income and consumption, food and nutrition security, export earning and land development - hence poverty reduction. Increased public investments

especially in agricultural research, rural infrastructure and education will promote agricultural growth. Agricultural growth is the primary source of poverty reduction in most agriculture-based economies. However, to achieve this there should be deliberate efforts and methods by respective governments. Public spending on either sector serves as an engine for economical growth and poverty reduction. Several studies (Cleaver 2013; Diao 2010; Fan and Saurkar 2012; Dewan and Ettlinger 2009; Mogues et al 2012; and Fan et al, 2009) have proven the importance of public spending on agriculture sector. Fan et al, 2009 found that public spending is one of the most direct and effective instruments that governments can use to promote agricultural growth and poverty reduction. Dedicated public spending on agriculture can lead to a faster rate of poverty alleviation, by raising the incomes of rural cultivators and reducing food expenditure, and thus reducing income inequality. De Janvry and Sadoulet (2010) found that a 1 percent growth in agriculture induces a direct reduction in the poverty rate of 1.73 percent. According to Mogues et al (2012) there are significant potential and observable effects on health and nutrition resulting from agricultural public investments viz. (i) increased production for self-consumption, in the case of subsistence farmers; (ii) reduced (low) prices for net buyers of food (Fan & Breisinger 2011); and (iii) increased marketable output for agricultural producers who sell whole or part of their output, resulting from increased agricultural productivity which then ensures food access, better nutrition through greater calorie consumption and gains in dietary diversity and improved health and access to health services. Dewan and Ettlinger (2009) found that public spending serves an important function in pursuing economic growth objectives while ensuring that gains are widely distributed to promote broad-based increases in living standards. According to Cleaver, (2013), an act by the government to stimulate agriculture at scale pays off by increasing food production and rural incomes. This means ample government commitment and enduring policies are a must. It was warned by Diao (2010) that agriculture sector has not developed without a comprehensive long term strategy and public investments. Chilonda at el (2009) emphasized investments in core public goods - science, infrastructure, and human capital - combined with better policies and institutions as the major drivers of agricultural productivity growth. It was found by Mogues (2012) that a 10 percent increase in the instability of total government spending on the agricultural sector causes, on average, a 0.36 percent decline in agricultural growth but a 1 percent change in agricultural expenditure

as a share of GDP produces a 0.43 percent reduction in poverty. It was further stated by Ravallion, (2001) that a rise in average household income by one percent leads to a fall in the poverty rates by about doubled percent on average. Both the FANRPAN and Fan et al, (2009) insisted that promoting higher agricultural growth is a key factor in reducing poverty and promoting overall economic growth. Fan et al, (2012) found that agricultural spending, education, and roads contributed strongly to agricultural growth. They further narrated that agricultural research spending had a larger productivity enhancing impact than non-research spending. Thus, for rapid economic growth public agricultural investment is an inevitable song into development stakeholders' hears especially developing countries including the case study. Research shows that investing in agriculture has positive results not only to the sector itself but also to other sectors. According to Mogues (2012) agricultural investments also have indirect benefits to almost all other nonagricultural sectors.

However, the sector is still facing a collection of obstructs within both developed and developing countries viz. insufficient funds, lack of political will, fraudulent practices by some of government employees, lack of expertise and insufficient appropriate information. Studies indicate that some countries are willing to invest in the sector but they face a problem of inadequate and pertinent particulars. As governments work to increase agricultural spending and enhance the sector growth, they face a paucity of information about which types of public investments contribute the most to development goals and how meager resources should be allocated among several concerns. With reference to Fan, et al (2009) in some cases some countries have clear principles on how to prioritize their scarce public resources, but they often lack the information needed to put them into functions.

2.7 The role and responsibilities of government on development of agriculture sector

According to Bandow (1997), every nation's economic environment is made up of a complex aggregation of individual laws and regulations and therefore, when it comes to development, the state's role in society is to provide the legal framework and physical security for private economic activity, not to act as an agent of economic change itself. This means the prosperity of the economic activity of any state is subject to stable physical security among many other aspects which is the primary role of the respective government. With reference to Campbell

(2009) it is the role of the government to ensure economic stability of a respective country as whole and individual sectors respectively. In other words, the growth of the agriculture sector is through government commitment to promote it. Campbell added that sound macroeconomic policies enhance the credibility which is fundamental for economic stability and the country's long-term investment decisions that allow the economy to flourish.

According to Seth (2016) it is the government role to ensure economic stability and full employment of resources for poverty reduction through different strategies inter alia: (i) comprehensive planning; as resources are always limited prioritization may help to solve this matter; (ii) institution of controls - e.g. price control, exchange control, control of capital issues, industrial licensing; (iii) social and economic overheads of basic social and economic operating costs such as schools, technical institutions and research institutes, hospitals and railways, roads, ports, harbors and bridges for initiating the process of economic growth through taxation, borrowing and deficit-financing sources. (iv) institutional and organizational reforms: through impositioning of ceiling on land holdings, tenancy reforms, introduction of co-operative farming, nationalization of insurance and banks reform of managing agency system and other reforms. (v) Setting up financial institutions: for coping with the growing requirements for finance special institutions for instance, Industrial Finance Corporation Industrial Development Bank and Agricultural Refinance and Development Corporation need to be in place to provide the necessary financial- resources; (vi) Public Undertakings; and (vii) Economic Planning: since most of developing countries suffer from a serious deficiency of all types of resources and skills, while the need for them is so great a wise and efficient allocation of limited resources assumes great endeavor. This can only be done through central planning according to a scheme of priorities well suited to the country's conditions and need.

Axelrad (2014) found that the advanced economies of Germany, the US and South Korea were achieved through four largely linear stages of agricultural finance development within each country namely: the informally-served stage; the government-entry stage; the bank-based stage and the market-based stage being differentiated based on sources of farm debt, government roles, and the nature of farm structure and productivity:

i) The informally-served stage: at this stage the government role is always little to no involvement; informal lenders usually fail to meet farmers' credit demands, but they also tend to charge high interest rates. Having no alternatives, smallholders in the informally-served stage are typically forced to either pay high rates or forego the loan.
ii) The government-entry stage: at this stage the governments purposefully step in to improve agricultural finance delivery. The major role being expanding available credit, working through farm-level organizations; enhancing agricultural productivity more broadly.
iii) The bank-based stage: here the major government role is oversight and regulation. The bank-based stage of agricultural finance development is defined by decreased government involvement and a well-established, soundly-regulated commercial bank presence. The government support to the sector is delivered through private creditors by using government loan guarantees as an incentive for banks to lend to smallholders and/or disadvantaged farmers.
iv) The market-based stage: the major role of the government here is soundly deregulation of the agricultural finance system for diversifying risk and increase competitiveness.

However, Axelrad (2014) warned that governments often directly shape the development of agricultural finance systems as they evolve. And there is no one-size-fits-all approach to agricultural finance policymaking. Therefore are advised to carefully design policies to enhance rather than replace credit provided to farmers by private actors to effectively met agricultural sectors' needs. This implies that governments are obliged to ensure smooth legal framework and policies to development stakeholders to support sectors development particularly agriculture.

With reference to Hartwich, & Jansen (2007) the role of government for the particular sector development can take into account the following parameters:

i) Participation in priority setting: it is the responsibility of the governments to set the agenda for research and innovation and provide normative guidelines for the

operations; participate in priority setting and decisions on funding and opening the forum for other stakeholders and beneficiaries to participate.

ii) Transparency and accountability: the government fostering the open exchange of information and render accounts to all stakeholders easily;

iii) Responsiveness: the government responds to the various demands and needs of the potential beneficiaries of the sector;

iv) Impact orientation: the government ensures that operations aiming to generate and diffuse improvement are carried out in the most effective and efficient way and are oriented to areas where they may have the greatest impact;

v) Delegation the government can delegate responsibilities and pass decision making power to local governments and other associated semipublic and private organizations;

vi) Strengthening linkages: the government encourages collaboration and the exchange of knowledge among involved agents through mechanisms such as development platforms, meetings and seminars, and financing of collaboration;

vii) Strategic vision: a strategic vision set by the government on how the effective system should support targeted development achievement.

From the above the economic theories that it is clear now that the government is vested with the primary responsibility to create opportunities, legal framework and policies to ensure the general development of the economy of the respective country and its individual sectors respectively. For this particular study, the governments are responsible for ensuring the development of agriculture sector as well.

2.8 Contribution of Agriculture Sector to the National GDP

The sector has got valuable contributions to the national GDP in both of the case study countries though at different levels. With reference to NBS (2015), in Tanzania agriculture was among the primary activities and contributed 31.5 percent of the national GDP during the year 2014 and it was estimated to increase up to 32 in the subsequent year. The trends of the sector contributions to the national GDP in comparison with other most important economic activities for the ten years up to 2015 can be observed in Table 2.1.

Table 2.1: Most Important Economic Activities with their respective percentage of contributions to the National GDP at Current Prices in Tanzania

Year	Agriculture & allied Activities	Industry & Construction	Services
2006	31.0	22.1	48.4
2007	28.8	21.7	50.9
2008	30.8	21.9	48.2
2009	32.4	19.9	48.7
2010	32.0	21.7	47.3
2011	31.3	24.3	45.5
2012	33.2	23.3	44.7
2013	33.3	24.2	43.8
2014	31.5	25.0	44.7
2015 P.E	32.0	23.5	44.5

Source: National Bureau of Statistics, of Tanzania (NBS) December 2016,
P.E = Provisional Estimates

From Table 2.1 it is observed that the sector contributes at least 30 percent of the national GDP leaving the rest 70 percent being shared by all other sectors.

Table 2.2: Economic Activities with their respective percentage of contributions to the National GDP at Current Prices in India

Year	Agriculture & allied Activities	Industry & Construction	Services*
2006	18.8	23.3	57.7
2007	18.3	24.3	57.5
2008	18.3	24.5	57.2
2009	17.8	23.9	58.2
2010	17.7	23.3	59.0
2011	18.2	22.7	59.1
2012	17.9	22.9	59.3
2013	17.5	22.2	60.3
2014 B.E	18.2	20.7	61.0
2015 R.E	17.8	22.1	60.1

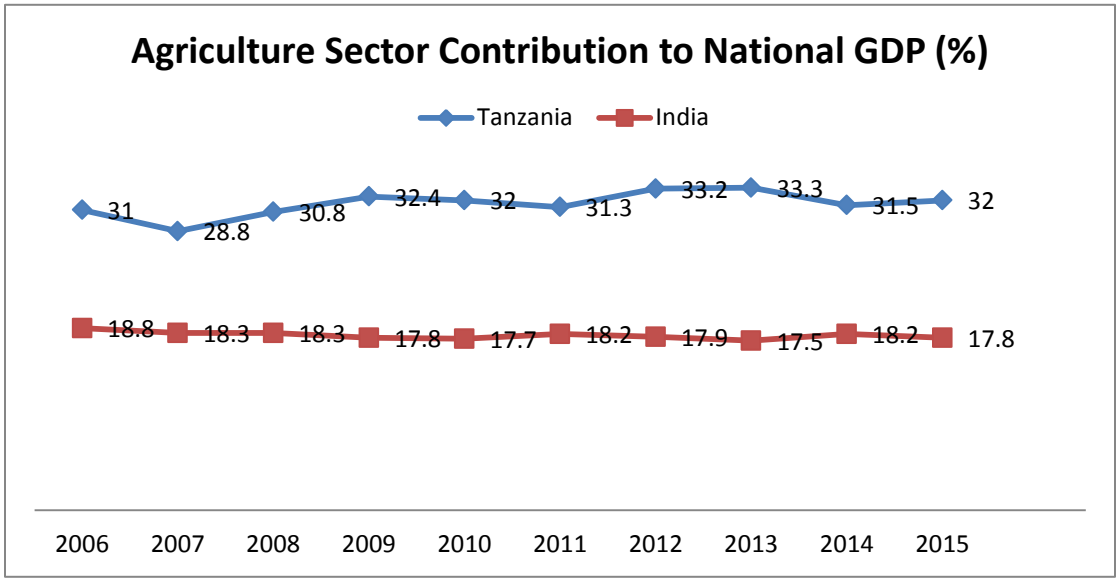
Source: Ministry of Statistics and Program Implementation - Summary of macroeconomic aggregates at current prices, 1950-51 to 2014-15

* = Transport, storage and communications, electricity gas & water supply, trade, hotels and restaurant, financing, insurance, real estate & business services, community, social and personal services for Provisional Estimates;

B.E = Budget Estimates; R.E = Revised Estimates

From Table 2.2 it is observed that the sector contributes less to the national GDP as compared to industry and construction and services respectively and it is decreasing with time. This means the Indian economy is transforming from agricultural to service industry or sector.

Figure 2.1: Comparison of Agriculture Sector contribution trends to the National GDP in India and Tanzania for the last ten years as by 2015 (%)



Source: Author's computation using data from National Bureau of Statistics of Tanzania and Ministry of Statistics and Program Implementation of India

From Figure 2.1 the agriculture sector contribution to the Tanzanian National GDP has remained above 30 percent from 31 to 32 percent between 2006 and 2015 respectively. This means more than one-third of the Tanzanian economy is depending on agriculture. attracts much attention of the government towards its promotion for effective growth.

In India the agriculture sector is a little bit lagging behind the other two important sectors contributing to the national GDP and has been gently falling from 18.8 to 17.8 percent between 2006 and 2015 respectively compared to the sector of services which has maintained a steady increase from time to time respectively. This means the Indian economy is transforming from agriculture to the service with a maximum of about 4 percent annual growth. However, according to NABARD (2014), the Gross Capital Formation (GCF) in agriculture and allied sectors as a percentage of agricultural GDP has increased from 14.9 percent in 2006-07 to 19.8 percent in 2011-12.

2.9 Current situation of the sector support by the respective governments

2.9.1 Budgetary allocation trends to agriculture sector

Generally, public investment on agriculture has received a commendable attention by most of governments of countries in the developed regions. Various studies indicate that there has been a promising trend in allocating both funds and other resources to the sector though varied from one region to another. According to Mogues et al, (2012) governments in the Asia and Pacific region appeared to focus more budgetary attention on agriculture, with per capita agricultural spending growing at 7.7 percent annually from 2000 to 2007; while it was doubled in Eastern Europe and Central Asia within the same period. But in the regions of Middle East and North Africa one side and Latin America and the Caribbean, situations were different. The former recorded a small fraction (2.5 percent) of agricultural expenditure of total government expenditures while the later recorded a downfall of total expenditure by 2 percent annually.

Mogues et al, found that Eastern Europe and Central Asia topped the levels of public investment in agriculture, with the high level of agricultural spending (almost $100 per person), and high intensity of agricultural spending in terms of agricultural GDP that was reported to have also doubled the sample average, at 15 percent. That across all regions, Asia experienced the most rapid growth in total expenditures at 7.4 percent per year, followed by Eastern Europe and Central Asia and Israel (ECA) at 6.7 percent per year and Middle East and North Africa (MENA) at 5.0 percent. Total government spending increased at a much

slower pace in Latin America and the Caribbean (LAC) (4.2 percent) and Sub-Saharan Africa (SSA) (2.5 percent).

Nevertheless, both of the case study countries fall into the regions that have historically not done well on public investment on agriculture. Past trends of public investment in agriculture in African countries have historically been very low compared to that in other developing regions. They invest less in agriculture and infrastructure. According to Mogues et al, (2012), although agriculture played a vital role in SSA's economic growth, contributing to nearly 30 percent of total GDP yet it has received less consideration by the respective governments whereby less than 5 percent of total government expenditure has been allocated to the agricultural sector in this region. This has made the region to lag behind the track of meeting the MDG 1 as reported by Fan et al (2009) that the notable efforts have been recognized in many developing regions, especially Asia and the Pacific but not in Africa. Fan warned that Sub-Saharan Africa was the only region of the developing world expected to have more poor people in 2015 than it did before. According to Fan et al (2009) African governments spend much less on agriculture than their counterparts in other developing countries. Fan further explains that in aggregate, African public spending on agriculture accounted between 5 and 7 percent of the total national budget from 1980 to 2005 compared to that for Asia which has been between 6 and 15 percent respectively during the same period. Thus, except Burkina Faso, Ethiopia, Malawi, and Mali the rest of African countries could not meet their pledges for CAADP through the Maputo declaration of 2003 for allocating at least 10 percent of total government budgetary spending to agriculture sector.

Both Tanzania and India have not done well on this aspect. They both have failed to allocate at least one-tenth of their total government expenditures for the entire period of twelve years from the financial years 2003-04 to 2014-15 respectively. Statistics indicates that in Tanzania the agricultural budget has generally been increasing gradually in both nominal and real terms although the percentages of funds allocated to the sector compared to the total government expenditure was fluctuating in some years. Data from the ministry of agriculture food security and corporative suggested a downfall from 5.7 to 5.46 percent between 2003-04 and 2014-15 respectively. To some extent the noted fluctuations can be related with

political policy and techniques as all the maximum figures were attained during the election financial years as it can be observed in Table 2.3. It was also insisted by Cooksey, (2013). He found that between 2002 and 2007, spending on Tanzanian agriculture ranged from 4.5 to 6.8 percent of the national budget and related it with politics treaty; that in 2010-11 (an election year) it rose to 7.8 percent of total expenditure, but falling back to 6.8 percent the following year.

According to URT, (2011), expenditure on agricultural sector has increased from Tsh.926.2 billion ($425 million) in 2011-12 compared to Tsh.903.8 billion ($414.6 million) in 2010-11 having positive expenditure change of 2.5 percent. However, the large portion of the sector expenditure is still allocated centrally. In 2011-12 the central allocation was Tshs.692.8 billion ($318.million), which is equivalent to 74.7 percent of sector budget compared to Tshs.234.2 billion ($107.5million) or 25.3 percent of the sector budget planned to be used at LGAs level. However, the same report confesses the decline of the agriculture sector share in the overall budget from 7.8 percent in 2010-11 to 6.9 percent in 2011-12 giving a simpler reason for this diminishing trend to be a large decrease in funds that had been invested in the sector in the year 2010-11 for procurement of power tillers. However, according to ANSAF, (2012a) since 2003 budget allocations to the sector have averaged at 6.2 percent which has impacted the annual growth rate of the sector currently averaging 4 percent despite over 80 percent of the total population depending on it for their livelihood. Because of this, they (ANSAF) questioned whether the government was dedicated to raising allocations to 10 percent as it committed by signing the Maputo Declaration.

Despite of belonging in the region with commendable investment on agriculture sector, India also has not performed well although it is far leading compared to her counterpart in this case study. According to Dev (2012), the share of public investment in total investment to the sector over time has declined from about 50 percent in the early 1980s to 20 percent in the decade of 2000s leaving a significant increase of the share of private investment from about 50 percent to 80 percent during the same period.

Table 2.3: Budgetary Allocation Trends to Agriculture Sector (Billion US $)

F/Y	Tanzania			India		
	Total Govt. Expenditure (Amount)	**Expend. on Agriculture (Amount)**	**% of Total Expenditure**	**Total Govt. Expenditure (Amount)**	**Expend. on Agriculture (Amount)**	**% of Total Expenditure**
2003-04	2.57	0.15	5.70	163.04	6.93	4.25
2004-05	3.19	0.15	4.71	185.19	10.36	5.60
2005-06	3.66	0.21	5.78	211.36	13.23	6.26
2006-07	3.97	0.23	5.78	243.63	15.91	6.53
2007-08	4.91	0.30	6.21	297.76	20.44	6.86
2008-09	5.84	0.42	7.17	345.56	27.43	7.94
2009-10*	7.18	0.55	7.60	380.98	26.68	7.00
2010-11	8.25	0.64	7.78	462.94	31.80	6.87
2011-12	8.78	0.60	6.85	481.15	30.49	6.34
2012-13	9.47	0.70	7.36	508.01	33.30	6.56
2013-14 B.E	11.40	0.57	4.98	547.58	36.75	6.71
2014-15 R.E	11.84	0.65	5.46	562.05	42.89	7.63

Source: Ministry of Agriculture, and Food Security and Corporative of Tanzania - Department of Statistics 2015 and Ministry of Finance – Indian Public Finance Statistics 2003-04 to 2014-15 respectively

Note:

(i) * = In Tanzania for FY 2009/10 there was an addition of Tshs 20bln/= (U$ 15 million) to rescue cotton crop due to economic crisis and Tshs 35bln/- (U$26 million) to buy and transfer grains under NFRA

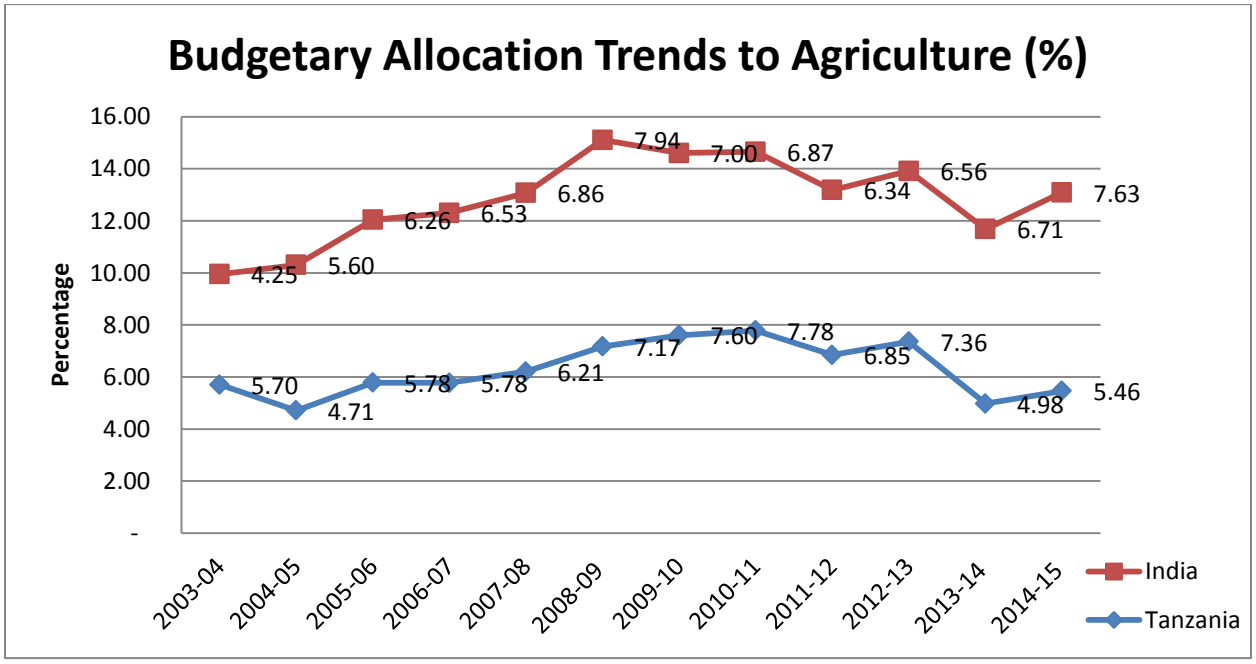
(ii) B.E = Budget Estimates; R.E = Revised Estimates for India data

The data in Table 2.3 can be clearly viewed from Figure 2.2 elaborating the trends of portions of total government expenditures allocated to the sector within the case study countries respectively.

The Indian Public Finance Statistics indicate that the percentage of funds allocated to the sector compared to the total government expenditure has been increasing progressively but slightly from 4.25 in the year 2003-04 to 7.63 in 2014-15 respectively (see Table 2.3). However, when compared to its counterpart India has done a commendable job in budgeting and funds allocation to agriculture sector and its allied activities. Statistics for 2012 by the

Ministry of Finance, Department of Economics Affairs – Government of India issued in the report of Indian Public Finance Statistics 2011-12 and earlier issues indicate that share of agriculture expenditure in the aggregate combined expenditure of the Central and State government (both recurrent and capital) has maintained a nominal average trend of budgeting and funds allocation to agriculture sector and its allied activities of 6.9 percent over the period of twenty six years between the financial years 1985-86 and 2011-12 respectively. Nevertheless, in real terms the portion of the sector expenditure over the total government expenditure has dropped from 7.2 in 1985-86 up to the lowest level of 5.6 percent between 2002-03 and 2004-05 before it began rising up to the maximum level of 7.9 percent during the financial year 2008-09. Data for the last ten years up to 2014-15 revealed a significant increase of resources allocation to the sector up to 7.6 percent although it did not meet the world's target of at least 10 percent of government expenditure to be allocated to the agriculture sector.

Figure 2.2: Comparison of Budgetary Allocation Trends to Agriculture Sector in India and Tanzania for the last twelve years as by the year 2014 -15 (%)



Source: Ministry of Agriculture, and Food Security and Corporative of Tanzania, Department of Statistics 2015 and Ministry of Finance – Indian Public Finance Statistics 2003-04 to 2014-15 respectively

From Figure 2.2 it observed that there are no specific policies within both of the case study countries to fund the sector. Rather, it can be related with political drives because as it can be observed from the data the portion used to increase either prior year to or during the general election year or both but drops suddenly in the subsequent years.

Generally, both of the case study countries have shown notable initiatives to increase budgetary allocation to the sector although not in a steady form. The highest rates attained by them were 7.94 and 7.78 percentages for India and Tanzania in 2008-09 and 2010-10 respectively before they retarded to 7.63 and 5.46 percentages respectively in the financial year 2014-15. Data suggest that India has done better as compared to her counterpart – Tanzania. However, neither of them has attained the one - tenth of the national expenditure to the sector which internationally recommended. Therefore it can be said that there were no specific policies and/or priorities within both of the case study countries for funding the sector rather than political drives.

Viewed from the trends of disbursement of budgeted funds towards implementation of the approved activities within the sector, it has been not such good within both countries. In Tanzania for example, data for budget and actual disbursement of funds to the Ministry of Agriculture from central government (Min. of Finance and Economic Affairs in Tanzania) for the last eight years up to June 2014-15 indicate that not all funds that were budgeted and approved were released accordingly. Data indicate that the portion of approved but not released funds ranged from 2 percent to 25 percent between the financial years 2007-08 and 2014-15 respectively (Table 2.4). This is in line with Studies by Gabagambi (2013). Gabagambi found that between 2000-01 and 2007-08 the budget deficit ranged between 6 and 49 percent respectively.

Table 2.4: Budget and actual disbursement of funds to the Ministry of Agriculture in Tanzania from Central Government for the last eight years up to June 2015 (Billion US$)

F/Y	Final Revised Budget Amount	Actual Amount Disbursed	Deficit/Excess Amount
2007-08	0.11	0.10	0.01
2008-09	0.12	0.12	0.00
2009-10	0.20	0.18	0.02
2010-11	0.20	0.15	0.05
2011-12	0.18	0.16	0.03
2012-13	0.13	0.19	(0.06)
2013-14	0.17	0.15	0.02
2014-15	0.14	0.11	0.03

Source: Ministry of Agriculture, food security and Cooperatives of Tanzania Department of Accounts and Finance 2015

From Table 2.4 it means during some years up to 25 percent of some of the planned and budgeted sector related activities could not be implemented accordingly due to lack of funds. Sometimes even such budgeted and approved funds for the sector on annual basis have not been released wholly and timely.

In India it was even worse, statistics for 2014-15 by IPFS, an Economic Division of the Ministry of Finance Department of Economic Affairs indicate that the approved budgets during the same period could only be implemented for less than 50 percent throughout ranging from 22 to 30 percent respectively as it can be observed from Table 2.5.

Further, viewed at individual respective government agencies (LGA) level, in Tanzania survey data from 27 LGGs revealed that the sector has been one among their major sources of their own source revenue whereby it contributed on average from 4 percent in 2003-04 to 90 percent in 2013-2014 respectively. However, only two LGAs out of them have confessed to have re-invested some of such earned funds to the sector but at a much neglected amount of less than 20 percent. One of the major reasons related to this was dependence of the government to the development partners' funds to finance the sector.

Table 2.5: Budget and actual disbursement of funds to the Ministry of Agriculture in India from Central Government for the last eight years up to March 2015 (Billion US$)

F/Y	Budgeted Amount	Actual Amount Disbursed	Deficit/Excess Amount
2007-08	19.42	4.57	14.85
2008-09	25.32	5.69	19.62
2009-10	27.94	6.49	21.46
2010-11	29.22	8.16	21.07
2011-12	28.94	8.78	20.16
2012-13	30.15	9.39	20.75
2013-14 B.E	30.94	10.80	20.14
2014-15 R.E	32.18	12.42	19.75

Source: Compiled from Ministry of Finance Department of Economic Affairs Economic Division, IPFS 2014-15

B.E = Budget Estimates; R.E = Revised Estimates

From Table 2.5 it means the approved budgets during the period could only be implemented for less than 40 percent throughout ranging from 22 to 30 percent respectively due to limited disbursement of funds from central government.

This means the verbal and political government commitment to promote the sector growth were not in line with the actual budgetary allocation and funds disbursement trends.

2.9.2 Evaluation of public investment trends to agriculture sector pertinent to its respective contributions to the national GDP of the case study contraries

In most of the developing (agricultural economy) countries, agriculture sector plays a fundamental role into their economy through contribution to the national GDP. Both India and Tanzania are termed as developing countries. This implies that their economy had ever depended on, or is still depending on the agriculture sector to some extent. In other words we expect considerable injection of resources into agriculture sector for its growth promotion.

In Tanzania as noticed earlier, the sector has maintained a steady contribution of about one-third to the national GDP for the last ten years up to 2015 and was increasing with time as it can be seen in Table 2.6. In India the agriculture sector contribution to the national GDP has been less than 20 percent throughout the same period and was decreasing with time (Table 2.6).

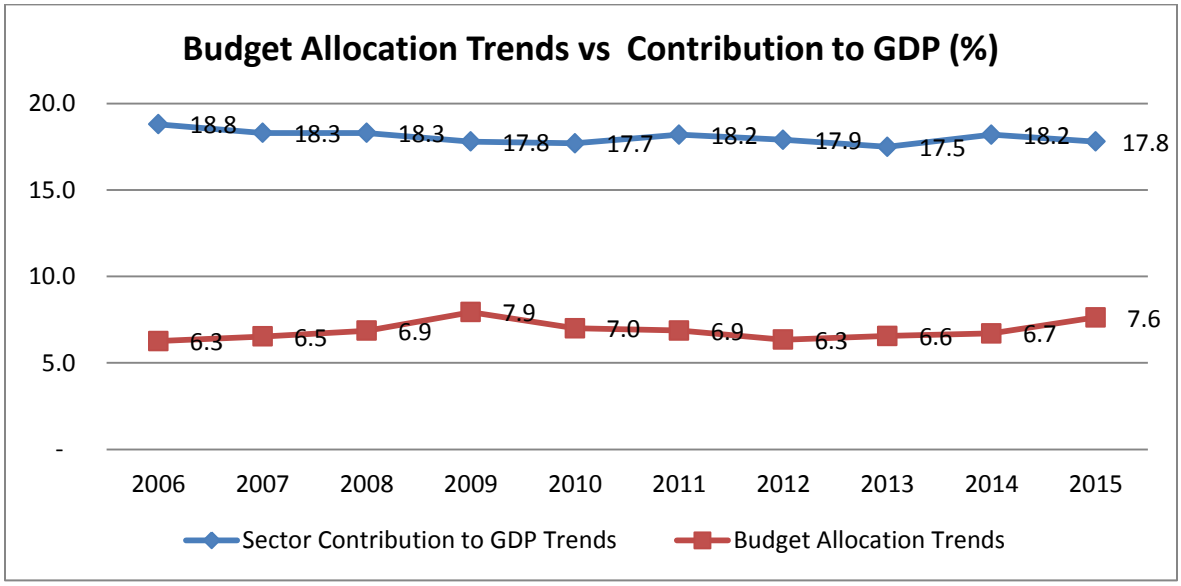
To the converse, very limited resources have been injected to the sector for its growth promotion by both of the case study countries. Although there have been small changes from time to time as it can be observed in Table 2.6, the amounts of funds allocated to the agriculture sector as a portion of the total annual government expenditure has remained below ten percent within both countries respectively.

Table 2.6: Analysis of public investment trends to agriculture sector pertinent to its respective contributions to the national GDP in India and Tanzania (All units in %)

Year	Tanzania		India	
	Contribution to GDP Trends	Budget Allocation Trends	Contribution to GDP Trends	Budget Allocation Trends
2006	31.0	5.8	18.8	6.3
2007	28.8	5.8	18.3	6.5
2008	30.8	6.2	18.3	6.9
2009	32.4	7.2	17.8	7.9
2010	32.0	7.6	17.7	7.0
2011	31.3	7.8	18.2	6.9
2012	33.2	6.9	17.9	6.3
2013	33.3	7.4	17.5	6.6
2014	31.5	5.0	18.2	6.7
2015	32.0	5.5	17.8	7.6

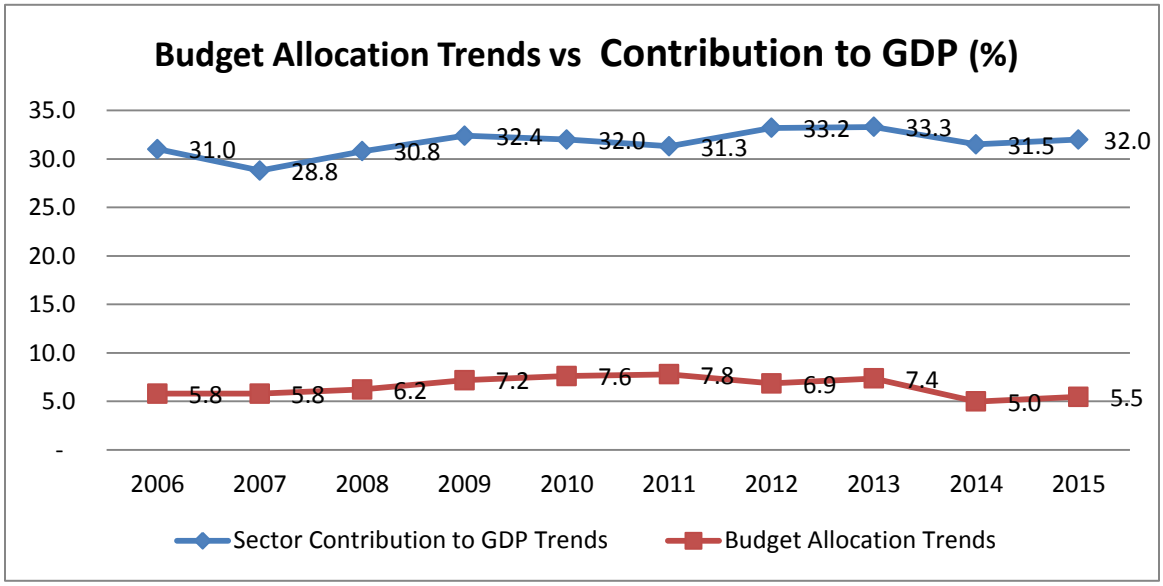
Source: Compiled from NBS-Tanzania, Ministry of Agriculture - Tanzania, Ministry of Statistics and Program Implementation-India and Ministry of Finance - India

Figure 2.3: Comparison of public investment trends to agriculture sector with respect to its contributions to the national GDP in India (%)



Source: Compiled using data from Ministry of Statistics and Program Implementation-India and Ministry of Finance - India

Figure 2.4: Comparison of public investment trends to agriculture sector with respect to its contributions to the national GDP in Tanzania (%)



Source: Compiled using data from NBS-Tanzania, Ministry of Agriculture - Tanzania

From Figure 2.3 it is observed that the agriculture sector contribution to the national GDP has been decreasing with time from 18.8 to 17.8 percent between 2006 and 2015 respectively registering a downfall of about 5 percent. This means the Indian economy is transforming from agriculture to other sectors. On the other hand, the amounts of funds injected to the agriculture sector as a portion of the total annual government expenditure has remained below ten percent ranging from 6.3 to 7.6 percent between 2006 and 2015 respectively registering a growth of 20 percent only.

From Figure 2.4 it is also observed that agriculture contribution to the national GDP has been increasing with time from 28.8 percent in 2007 as a minimum to 33.3 percent in 2013 as a maximum respectively registering a growth of about 16 percent. This means about one-third of the Tanzanian economy is be controlled or determined by agriculture sector. However, the amounts of funds injected to the agriculture sector as a portion of the total annual government expenditure were not in line with its respective contribution to the national GDP. They have remained as low as 5.8 percent in 2011 and increased up to 7.8 percent in 2011 before it started falling up to 5.5 percent in 2015. This means the amount to be allocated to the agriculture sector could be determined by the political tactics rather than the specific country policy for promoting agriculture sector as it is observed that all the highest or maximum rates have been attained either prior or during the general election years but declines immediately after elections respectively.

Therefore, public investment trends to the sector have not considered its respective contributions to the national GDPs by both governments of the case study countries.

2.9.3 Management of funds and/or resources allocated to the sector

Despite of the meagerness of resources and the tiny amount allocated to the agriculture sector, considerable portions have been spent on non development items (i.e. for expenses that has no direct impacts to the sector development) such as payment for extra duty, staff transport and subsistence/perdiem allowances, fuel, training materials, buying office supplies and in most cases political related conventions like councilors assembly. The ten year statistics for expenditure comparison between recurrent (supply vote account) vs. capital

(development vote account) by the Ministry of Agriculture, Food security and Cooperative Tanzania up to June 2014-15 indicate a drastic dominance of the recurrent (recurring) expenditure with an average of 58 percent of total funds allocated to the sector as compared to capital expenditure whose average stood at 42 percent of the total funds allocated to the sector respectively as it can be observed in Table 2.7. Different studies (Gabagambi 2013, Ezekwesili et al 2011, Gabagambi 2009, etc) are in line with this data. Studies by Gabagambi (2013) found that in 2000/01 recurrent budget for MAFC has increased from 39.5 to 59 percent between 2000-01 and 2011-12 while development budget went inversely dropping from 60.5 to 41 percent during the same period respectively. Ezekwesili et al, (2011) reported that in 2010-11 recurrent spending occupied significant share of the budget, approximately 65 percent of the overall budget, equivalent to 20 percent of GDP**.** According to Gabagambi, (2009) in recent years the recurrent budget for MAFSC has been increasing whereas development budget decreasing leaving more than 90 percent of development budget to be funded by Development Partners (DP) under different modalities including loans and grants. There were no genuine reasons within both of the case study countries rather than lack of political will of the respective governments.

The URT, (2011) insisted this that the recurrent budget execution of agriculture sector recorded 123.8 percent in 2010-11 compared to 119 percent recorded in 2009-10 and share of recurrent expenditure allocation in the budget in the financial year 2011-12 has increased compared to the previous one. The only simple reason given was increased government commitment on recruitment of professional staff for sectors. The report further entails that the foreign development component remained relatively high in 2010-11 recording at 86.7 percent compared to locally funded component recording 29.5 percent. But yet within the same report, the government regrets that the low rate of execution of the capital spending budget, especially in the critical infrastructure sectors such as energy, agriculture (irrigation) and other sectors, has potentially held back government efforts to significantly address earnings poverty in the country.

Table 2.7: Comparison between Recurring and Capital Expenditure Trends within the approved Annual Expenditure for Agriculture Sector in Tanzania (Amount in Billion US $)

Financial Year	Approved Estimates (A)	Recurring Expenditure		Development Expenditure	
		Amount (B)	Percentage (B/A)	Amount (C)	Percentage (C/A)
2006	0.19	0.11	55	0.09	45
2007	0.23	0.13	58	0.10	42
2008	0.30	0.15	50	0.15	50
2009	0.39	0.23	60	0.16	40
2010	0.51	0.17	56	0.13	44
2011	0.59	0.19	55	0.15	45
2012	0.58	0.20	57	0.15	43
2013	0.69	0.42	61	0.27	39
2014	0.54	0.37	67	0.18	33
2015	0.55	0.33	62	0.20	38

Source: Ministry of Agriculture Tanzania Department of Statistics, 2015

From Table 2.7 it can be concluded that most of the funds (more than 55 percent) on average are being spent on activities which have no direct impacts to individual stakeholders and the sector as a whole. This is not healthy for the sector development

In India the same scenario was observed too. Yet large portion of such meager resources have been spent for activities and items which have no direct impacts to the sector directly. Statistics for 2012 by the government of India revealed that the average percentage of development or capital expenditure as a portion of total expenditure on agriculture and its allied activities stood at 10.8 for the period of ten years between 2005-06 and 2014-15 with a minimum of 9 in 2005-06 and maximum rate of 14 percent in 2014-15 respectively as it can be observed in Table 2.8 and Figure 2.5 and 2.6 respectively.

Table 2.8: Comparison between Recurring and Capital Expenditure Trends within the approved Annual Expenditure for Agriculture Sector in India (Amount in Billion US $)

Financial Year	Approved Estimates (A)	Recurring Expenditure		Development Expenditure	
		Amount (B)	Percentage (B/A)	Amount (C)	Percentage (C/A)
2006	13.10	11.86	91	1.24	9
2007	16.99	15.29	90	1.70	10
2008	19.42	17.35	89	2.06	11
2009	25.32	22.71	90	2.61	10
2010	27.94	24.33	87	3.61	13
2011	29.22	26.68	91	2.55	9
2012	28.94	25.61	89	3.33	11
2013	30.16	26.75	89	3.41	11
2014 B.E	33.62	30.23	90	3.39	10
2015 R.E	42.07	36.13	86	5.93	14

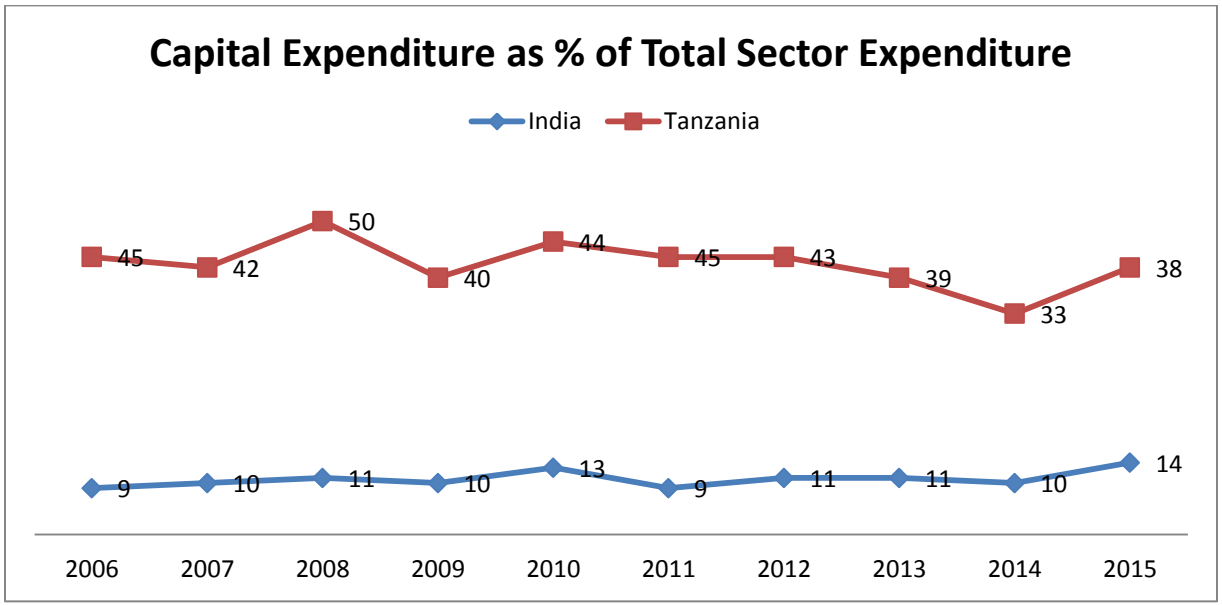
Source: Ministry of Finance (Department of Economics Affairs) GoI (2015); IPFS 2005-06 to 2014-15; B.E = Budget Estimates; R.E = Revised Estimates

From Table 2.8 it is observed that very limited resources (about 10 percent) on average are being spent on development activities leaving huge resources (about 90 percent) being wasted to activities which have no direct impacts to individual stakeholders and the sector as a whole. This also is not healthy for the sector development

Conversely recurrent (recurring) expenditure reflected outsized amounts of resources spent from the total amount allocated to the sector as a whole compared to the development expenditure. The Indian Public Finance Statistics Data of recurrent or revenue expenditure as a portion of the total budget for agriculture sector was as much as nine times of such spent for development related activities with an average of 89.75 percent for the period of ten years between 2005-06 and 2014-15 with a minimum of 86 percent in 2014-15 and maximum rate of 91 in 2005-06 respectively as it can be observed in Table 2.8 and Fig. 2.5 and 2.6 respectively. Some reasons for such unbalanced allocation of meager resources were observed and/or reported including irrational distribution of meager resources, inappropriate

and inconsistent sources of budgeting information at lower level particularly LGA's, political detain, delayed disbursement, poor community commitment, low technical capacity of the private sector at community level, poor extension system, and fund mismanagement as depicted by most of the Tanzanian CAG reports.

Figure 2.5: Comparison of Capital Expenditure Trends as a Portion of the Approved Annual Expenditure for Agriculture Sector in India and Tanzania (%)



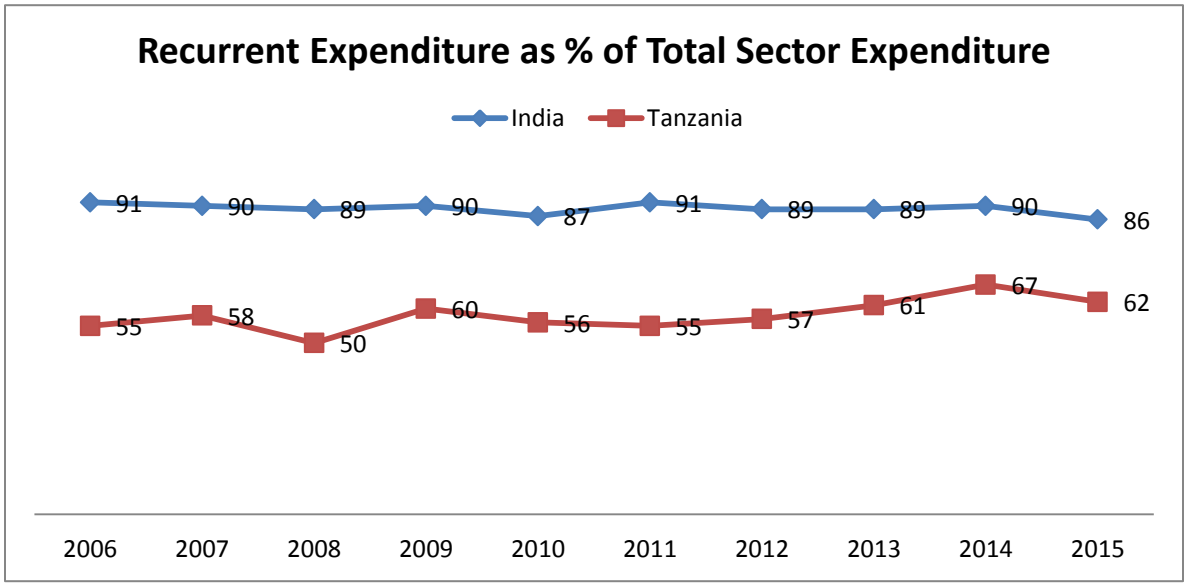
Source: Ministry of Finance GoI 2015 and Ministry of Agriculture URT 2015

From Figure 2.5 it is observed that very limited portions of approved funds for agriculture sector have been allocated to the capital expenditure which are deemed to have direct.
While Tanzania has managed to spend for development from 33 as a minimum in 2013-14 to 62 in 2003-04 percent of the sector total budget, in India the situation was even worse. It ranged from 6 percent in 2003-04 to 14 percent in 2014-15 within the same period. It is observed that the sector has been used as seepage for extracting public resources for extravagant expenses for some few government officials with no remarkable returns to the public.

As it can be observed in Figure 2.6, huge amounts of funds allocated into the agriculture sector have been spent for recurrent expenses. In India the portion of recurrent expenditure as

a part of total approved annual expenditure for agriculture sector has remained high ranging between 91 and 86 percent between 2006 and 2015 respectively. In Tanzania it was a little bit low ranging between 55 and 62 percent during the same period respectively.

Figure 2.6: Comparison of Recurrent Expenditure Trends as a Portion of the Approved Annual Expenditure for Agriculture Sector in India and Tanzania (%)



Source: Ministry of Finance GoI, 2015 and Ministry of Agriculture URT, 2015

This means there has been no purposeful initiatives to promote the agriculture sector in a visible manner by the respective government rather than using it as seepage for extracting public resources for extravagant expenses for some few government officials with no remarkable returns to the general public.

2.9.4 Creation and facilitation of features supporting the sector

The government commitment in promoting the sector cannot be just measured by the amounts allocated to the sector at particular time. Because allocating funds to the sector is one aspect but managing them properly for effective economical outcomes is our most concern. Here we consider creation and/or facilitating all features that are deemed as opportunities for promoting agriculture sector. They include creation and retention of

agricultural experts, enlarging the arable land, promoting irrigation farming and capacity building of stakeholders.

Table 2.9: Number of Agricultural Experts (FTE) present in each country

Year	India	Tanzania
2005	12,283	687
2006	11,720	697
2007	11,395	695
2008	11,379	690
2009	11,217	684
2010	11,330	693
2011	11,308	815
2012	12,650	813
2013	13,109	855
2014	13,716	911
2015	14,515	958

Source: FAOSTAT 2016

Data in Table 2.9 depicts limited number of qualified agricultural experts meaning that the number of agriculture stakeholders being served by an individual expert is very high. The distribution of agricultural researchers to agricultural stakeholders in Tanzania and India can be observed in Table 2.10 and 2.11 respectively.

Table 2.10: Number of farmers per individual Agricultural Experts in Tanzania

Year	Total Population (Million) [A]	% of Rural Pop. to Total Population [B]	No. of Researchers [C]	Farmers Per Researcher [(A*B)/C]
2006	40.26	75	697	43,040
2007	41.52	74	695	44,170
2008	42.84	73	690	45,501
2009	44.22	73	684	46,940
2010	45.65	72	693	47,386
2011	47.12	71	815	41,179
2012	48.65	71	813	42,186
2013	50.21	70	855	40,972
2014	51.82	69	911	39,313
2015	53.47	68	958	38,190

Source: Self computation using FAOSTAT 2017 and World Bank 2017 data

As it can be viewed in Table 2.9 the situation is not promising within both of the case study countries. Statistics for 2015 by FAOSTAT indicate that both countries are exposed to a problem of insufficient number of full time employed agricultural researchers compared to their actual demands.

The insufficient number of agricultural experts has a great effect the sector development and economic growth of the respective country. This begins from low agricultural productivity caused by poor agriculture techniques applied by individual farmers, low income caused by such low productivity, shortage of food and other agricultural produce hence high prices of food stuffs food and finally food and nutritional insecurity resulting from such shortage of food. It further limits both individual farmers export earning and the country as whole. For agricultural based economy countries like the case study countries it affects even their national GDP.

Table 2.11: Number of farmers per individual Agricultural Experts in India

Year	Total Population (Billion) [A]	% of Rural Pop. to Total Population [B]	No. of Researchers [C]	Farmers Per Researcher [(A*B)/C]
2006	1.16	70	11,720	69,836
2007	1.18	70	11,395	72,568
2008	1.20	70	11,379	73,382
2009	1.21	69	11,217	75,139
2010	1.23	69	11,330	75,044
2011	1.25	69	11,308	75,810
2012	1.26	68	12,650	68,291
2013	1.28	68	13,109	66,377
2014	1.30	68	13,716	63,873
2015	1.31	67	14,515	60,744

Source: Self computation using FAOSTAT 2016 and World Bank 2016 data

From Table 2.10 and 2.11 the number of farmers being served by an individual researcher is very high and unacceptable.

Viewed from their size of land, India has an area of 3.287 million km² (about 328.7 million ha) while Tanzania has an area of 0.947 million km² (about 95 million ha). This means India

is as bigger as more than three times of Tanzania. Their arable land as a percentage of total land area for the last ten years up to 2014 is summarized in Table 2.12.

Table 2.12: Arable land as a percentage of total land area within the case study countries

Year	Tanzania	India
2005	10	49
2006	10	48
2997	11	48
2008	12	48
2009	12	48
2010	12	48
2011	13	48
2012	14	48
2013	14	48
2014	14	48

Source: FAOSTAT 2017, Author's computations

From Table 2.12, the size of arable land in India has remained almost the same for the last ten years in India but Tanzania has maintained a steady increase of the arable land size for the same period from 10 in 2005 to 14 percent respectively.

Viewed from the total government expenditure on the sector per arable land context, both countries have maintained an increase from 15 and 65 U$ per ha of arable land in 2005 to 46 and 274 U$ per ha of arable land in 2015 for Tanzania and India respectively as it can be observed in Table 2.13.

However, considering the importance of the sector to the individual population and the country as a whole, such ratios are too minimal for the effective and sustainable growth of the sector and general economy.

Table 2.13: Comparison of total expenditure on the agriculture sector per arable land (U$/ha) in Tanzania and India for the period of 11 years up to 2015

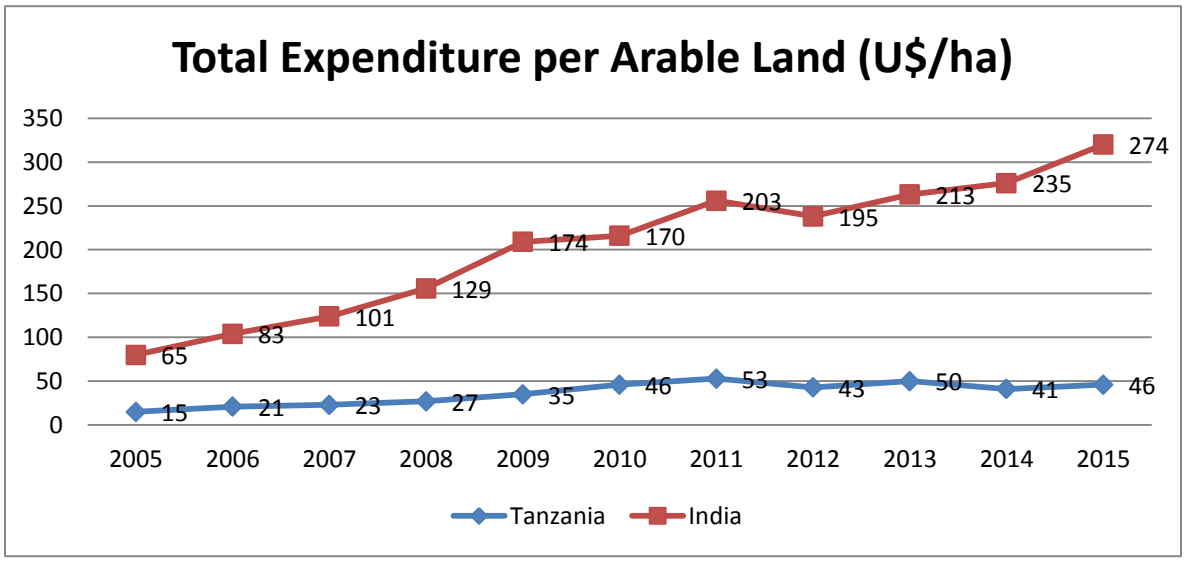
Year	Tanzania			India		
	Arable land (Million ha)	Total Exp. To Agriculture (Billion U$)	Ratio (U$/ha)	Arable land (Million ha)	Total Exp. To Agriculture (Billion U$)	Ratio (U$/ha)
2006	10	0.21	21	159	13.23	83
2007	10	0.23	23	158	15.91	101
2008	11	0.30	27	158	20.44	129
2009	12	0.42	35	158	27.43	174
2010	12	0.55	46	157	26.68	170
2011	12	0.64	53	157	31.80	203
2012	14	0.60	43	157	30.49	195
2013	14	0.70	50	156	33.30	213
2014	14	0.57	41	156	36.75	235
2015 PE	14	0.65	46	156	42.89	274

Source: Self computation using FAO, Min. of finances of India and Ministry of Agriculture of Tanzania respectively; PE = Provisional Estimates

Then we need to see how much of the total sector expenditures at a particular year were allocated to activities that are expected to have both social and economical impacts directly to individual stakeholders and the community as a whole. This is computed by comparing the total amount spent for development activities as a portion of the total sector expenditure by a country during a particular financial year and the country arable land during the same year for establishing agricultural infrastructures such as roads, irrigation dams or canals, electricity, storage and pre-processing facilities, agriculture mechanization and marketing as it can be observed in Table 2.14.

As it can be observed in Fig. 2.7, the amount of total expenditure per arable land in India has changed from $65 to $274 between 2005 and 2015 respectively registering an increase of more than 321 percent. For Tanzania it has changed from $15 to $46 during the same period registering an increase of more than 200 percent.

Figure 2.7: Comparison of total expend. on agriculture sector per arable land (U$/ha)



Source: Self computation using data from FAO, Min. of Finance of India and Ministry of Agriculture of Tanzania respectively.

India has been injecting about 4 times as much money per hectare of arable land compared to that of Tanzania. However, such amounts are still low compared to the importance of the sector especially Tanzania whose one-third economy depends on agriculture.

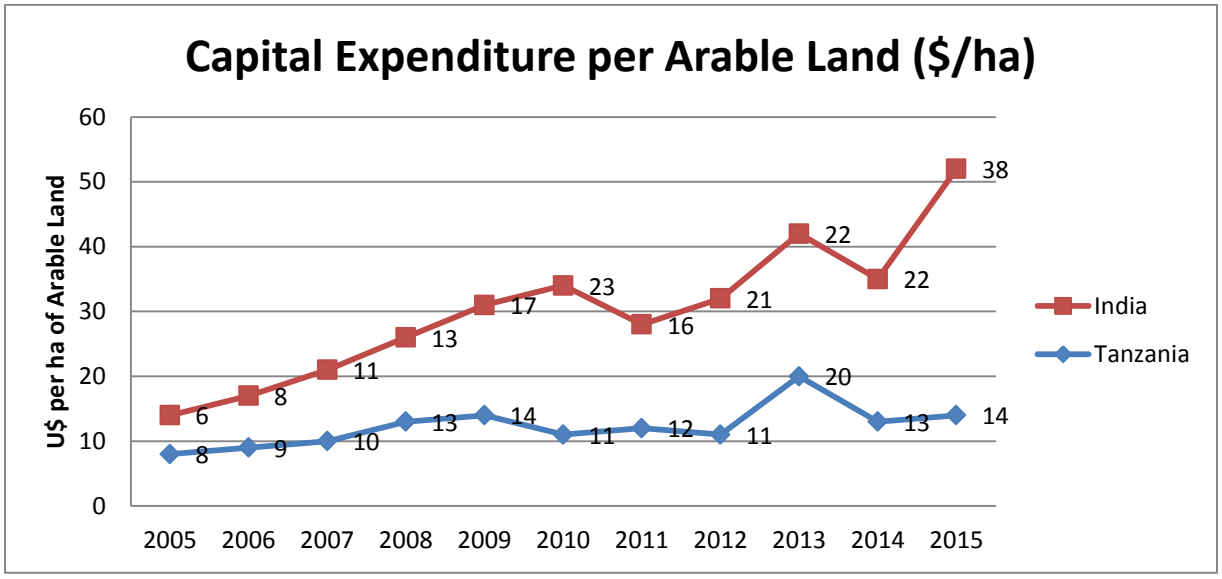
Table 2.14: Comparison of sector Capital expenditure per ha of arable land ($/ha)

Year	Tanzania			India		
	Arable land (Million ha)	Dev. Expend. (Billion U$)	Ratio (U$/ha)	Arable land (Million ha)	Dev. Expend. (Billion U$)	Ratio (U$/ha)
2006	10	0.09	9	159	1.24	8
2007	10	0.10	10	158	1.7	11
2008	11	0.15	13	158	2.06	13
2009	12	0.16	14	158	2.61	17
2010	12	0.13	11	157	3.61	23
2011	12	0.15	12	157	2.55	16
2012	14	0.15	11	157	3.33	21
2013	14	0.27	20	156	3.41	22
2014	14	0.18	13	156	3.39	22
2015 PE	14	0.20	14	156	5.93	38

Source: Computed using FAO, Indian Min. of Finance and Tanzania Min. of Agriculture;

PE = Provisional Estimates

Figure 2.8: Comparison of Agricultural Capital expenditure per arable land (U$/ha) in Tanzania and India for eleven years up to 2015



Source: Computed using FAO, Indian Min. of Finance and Tanzanian Min. of Agriculture

From Fig. 2.8, it is observed that the amount of capital expenditure per arable land in India has changed from $6 to $38 between 2005 and 2015 respectively registering an increase of more than 533 percent. For Tanzania it has changed from $8 to $14 between 2005 and 2015 respectively registering an increase of 75 percent.

However, despite the huge amounts injected by the Indian government to the sector, very minor portions per arable land could be apportioned to development (capital expenditure) activities with direct impacts to individual stakeholders and the community as a whole.

2.9.5 Fertilizer consumption trends

For high agricultural productivity and sustainable agricultural growth fertilizer consumption assumes a valuable deliberation. This was confirmed by Desai (2012) that fertilizers and pesticides occupy the second rank of importance in their contribution to agricultural production. According to Bumb and Baanante (1996), fertilizers replenish the nutrients

removed from soils by harvested crops; encourage adoption of high-yielding varieties, and increase biomass in the nutrient-poor soils of the tropics. In simple words, fertilizer consumption is among other factors necessary for the sector growth through high agricultural productivity which in turn leads to poverty reduction and sustainable development.

Table 2.15 Fertilizer Consumption Trends - Tanzania and the E. Africa Region (Kg/ha)

FY	Burundi	Kenya	Rwanda	Tanzania	Uganda
2005	3.5	34.3	3.1	5.8	1.0
2006	3.3	33.2	3.5	5.4	1.3
2997	2.0	36.4	7.9	5.1	1.2
2008	2.2	33.3	9.6	4.7	2.9
2009	1.9	31.9	1.3	7.5	2.1
2010	3.6	30.3	0.1	8.8	1.7
2011	5.6	43.6	0.1	8.6	1.8
2012	5.7	42.1	4.1	7.7	1.8
2013	7.4	52.5	10.1	4.7	2.3
2014	10.9	11.3	11.8	8.5	1.7
Average*	**4.6**	**34.9**	**5.2**	**6.7**	**1.8**

Source: Word Bank 2016; World Development Indicators; and author's computations

* = average consumption for the last 10 years as by 2014

According to the URT (2009) fertilizer use in Tanzania was about 8kg/ha which is even the lowest when compared to other countries in the region such as Kenya 34 kg/ha, Malawi 27 kg/ha, Zimbabwe 52.kg/ha, Mauritius 33kg/ha and 53kg/ha in South Africa. Nevertheless, both of the case study countries have not done well on this aspect as compared to their respective regions' country members and the world average rates though India is far better than Tanzania in almost all aspects considered.

Statistics by the World Bank suggest that Tanzania is ranked the second among the 5 East African countries with an average of 6.7 kg/ha behind Kenya whose average was 34.9 kg/ha for the last ten years up to 2014 as it can be viewed in Table 2.15. India is the fourth among the 9 South Asia region countries with an average of 144.2 kg/ha behind Malaysia, China and Vietnam whose average per hectare consumption was 1,749.1; 436.5 and 346.2 respectively during the same period (Table 2.16).

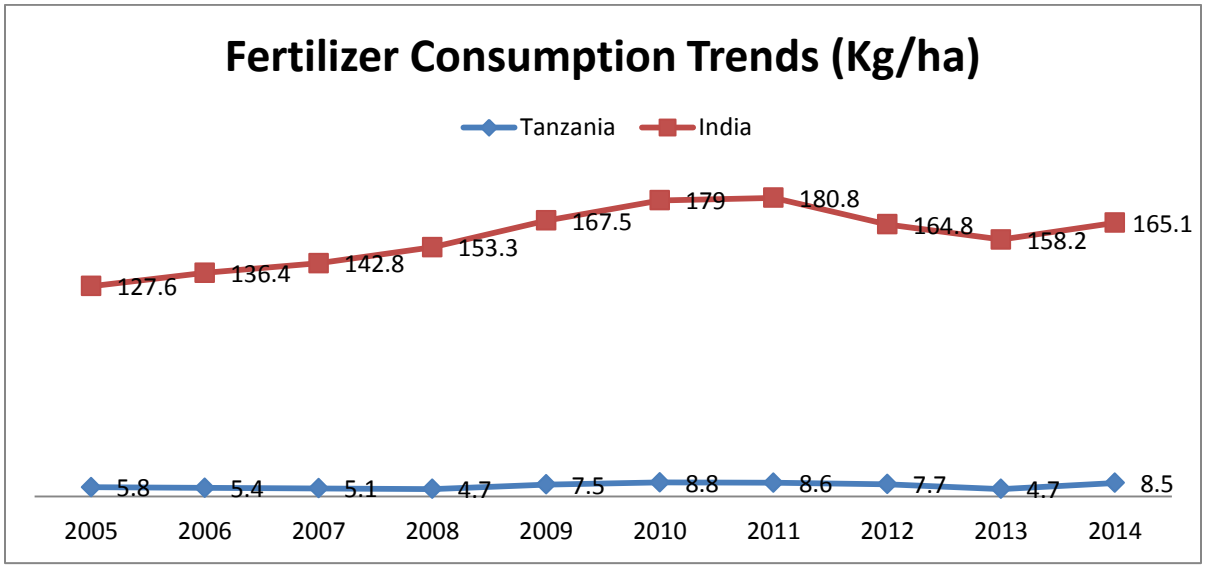
Table 2.16: Fertilizer Consumption Trends in India and the South Asia Region (Kg/ha)

FY	Afghanistan	China	India	Malaysia	Myanmar	Nepal	Pakistan	Thailand	Vietnam
2005	4.2	308.5	127.6	1,457.4	6.5	3.6	123.5	112.7	292.3
2006	6.3	325.8	136.4	1,662.1	9.0	5.6	125.7	117.4	300.2
2007	3.6	332.2	142.8	1,836.5	15.8	1.6	118.4	125.0	353.0
2008	3.0	335.6	153.3	2,026.9	7.6	1.4	119.2	130.5	305.7
2009	4.5	342.7	167.5	1,527.6	6.2	18.2	144.3	122.1	407.7
2010	4.5	515.4	179.0	2,002.7	6.6	25.1	138.3	162.2	323.3
2011	4.3	533.4	180.8	1,553.7	15.0	35.8	127.5	159.2	309.6
2012	6.6	549.1	164.8	1,635.7	15.8	26.7	116.9	151.8	332.0
2013	28.1	557.1	158.2	1,724.4	17.1	54.5	135.3	167.1	440.4
2014	12.3	565.3	165.1	2,063.9	20.5	67.4	134.4	152.3	397.4
Average*	**7.4**	**436.5**	**157.6**	**1749.1**	**12.0**	**24.0**	**128.4**	**140.0**	**346.2**

Source: W.B 2016; World Development Indicators; and author's computations

* = average consumption for the last 10 years as by 2014

Figure 2.9: Fertilizer consumption trends in India and Tanzania (Kg/ha)



Source: W.B 2017; World Development Indicators for the last 10 years by 2014

From Figure 2.9 it is observed that India is far leading for more than 24 times above Tanzania in the per hectare fertilizer consumption. It has changed from 127.6 to 165.1 kg/ha between 2005 and 2014. This implies an increase of about 30 percent during that period. In Tanzania it has remained low below 10kg/ha changing from 5.8 to 8.5 kg/ha between 2005 and 2014 respectively registering an increase of 46 percent.

This further implies that low per hectare fertilizer consumption in Tanzania is among other factors limiting their agricultural productivity. Therefore Tanzania has a great potential of improving their agricultural productivity by increasing the per hectare fertilizer consumption.

Viewed from consumption trends by category India has also maintained a commendable trend as compared to her counterpart Tanzania. Statistics by the International Fertilizer Association (IFA) on the per hectare consumption trend by category based on the three major nutrients in fertilizer i.e. Nitrogen (N), Phosphate (P2O5) and Potash (C) N-P-K also suggested that India has maintained a steady increase in consumption from 310.0(N), 70.8(P2O5) and 37.1(K2O) in 1961 to 16,730.80, 5,694.80 and 2,057.80 in 2013 respectively leading to the average of 10,035.91, 4,038.12 and 1,698.94 during such period respectively.

Table 2.17: Fertilizer Consumption by Category ('000' tones nutrients)

Year	Tanzania			India		
	N	**P2O5**	**K2O**	**N**	**P2O5**	**K2O**
2005	30.2	3.2	2.6	12,723.3	5,227.4	2,413.3
2006	34.3	3.8	1.8	13,774.1	5,537.3	2,334.8
2007	39.0	3.0	2.9	14,419.1	5,520.2	2,636.6
2008	36.4	2.0	0.6	15,090.1	6,506.2	3,312.6
2009	53.6	5.0	1.0	15,582.4	7,278.4	3,632.4
2010	71.0	5.0	10.0	16,558.2	8,049.7	3,514.3
2011	79.2	5.0	4.7	17,300.2	7,914.2	2,575.5
2012	64.9	6.0	5.6	16,820.9	6,653.4	2,061.8
2013	80.0	15.0	7.0	16,730.8	5,694.8	2,057.8
2014	74.7	8.7	5.8	16,950.6	6,754.1	2,231.7
Average*	**56.3**	**5.7**	**4.2**	**15,595.0**	**5,513.6**	**2677.1**

Source: International Fertilizers Association IFA 2016 and author's computation

***** = the Average Consumption Trends by Category for the last ten years up to 2014

From Table 2.17 it is observed that there have been commendable initiatives by the government of India by injecting considerable resources to ensure sector growth through this aspect as compared to her counterpart. On the other hand Tanzania need to pull up their socks by not only injecting huge funds for importing fertilizers but also planning to construct

their own fertilizer manufacturing industries in order to get rid of the current situation of being a price taker.

The situation is even discouraging in Tanzania, while the consumption for N has increased from 30.2 in 2005 to 74.7 in 2014 with an average of 56.3, the rest two P2O5 and K2O maintained averages of less than 10kg/ha (i.e. 5.7 and 4.2 respectively) as they increased from 3.2 to 8.7 for P2O5 and 2.6 to 5.8 for K2O during the same period respectively. Ref. Table 2.17. Different reasons to such low consumption in Tanzania are related but the most is high costs of fertilizers caused by lack of fertilizer producers as compared to her counterpart India. While according to Mala (2013) India has 56 large size fertilizers plants manufacturing a wide range of nitrogenous, phosphatic and complex fertilizers, to date Tanzania has only one private fertilizer manufacturing company (i.e. Minjingu Mines and Fertilizer Ltd based in Arusha). This situation has lead to the vast majority of domestic fertilizer demands about 90 percent to be met through importation by the private sector from a wide range of origins, viz. the USA, Russia, Ukraine, Finland, Norway, Australia, Morocco, Egypt and various countries in the Middle East. Kamuhabwa (2014) insisted on this that at present about 10 percent of fertilizer usage in Tanzania is domestically sourced from Minjingu Mines and Fertilizers Limited, the situation that makes it a price taker.

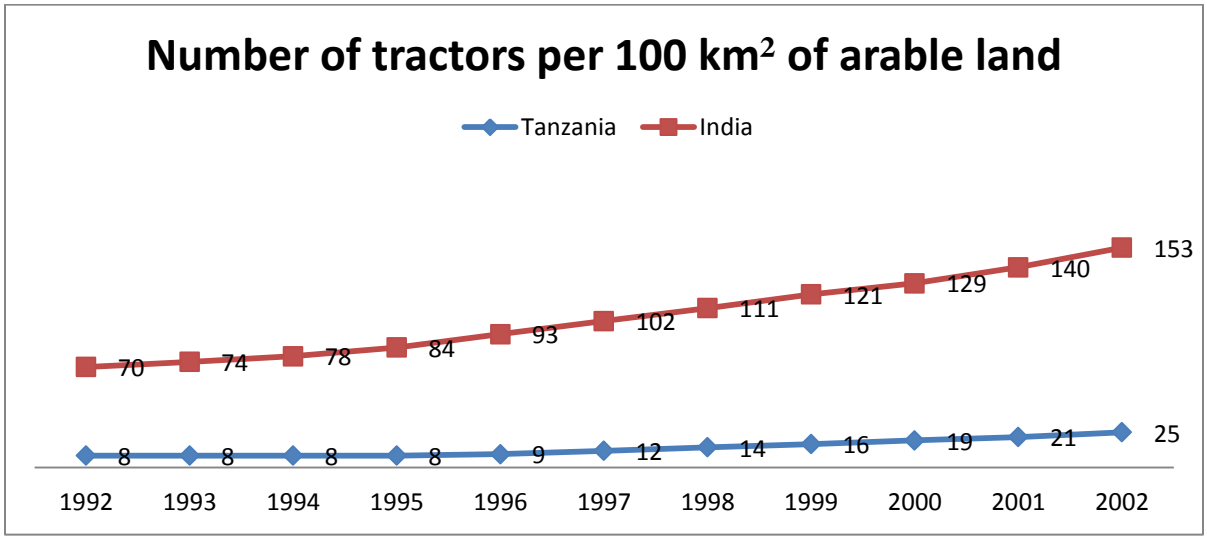
2.9.6 Agriculture mechanization support

Agriculture mechanization forms a part of the important aspects for sector development by providing opportunities for increasing farm productivity for both individual farmers' income and national economic growth. Availability of adequate farm power is very crucial for timely farm operations, increasing land and labor efficiency, increasing production and productivity and reducing crop produce losses (Kulakarni 2013). Agriculture mechanization helps to address the issues of scarcity of farm labor during peak agricultural seasons like sowing and harvesting. It has been observed by researchers that farm power availability and food grain yield have a direct relationship. States with higher farm power availability have, in general, more productivity.

In Tanzania mechanization of agriculture, a catalyst of improving farm productivity and commercialization of agriculture, is still a big challenge facing majority of farming communities. Majority of farmers are still using hoes and animals for cultivating their farms as they cannot afford the prices of modern farm equipments like tractors. According to Kibuuka (2014) the current estimates and projections indicate that about 70 percent of Tanzania's total crop producing areas is cultivated by the hand hoe, 20 per cent by ox-ploughs and leaving only 10 per cent for tractors.

India has excelled well on this aspect as compared to her counterpart Tanzania. With reference to GOI (2013), the tractor density in India stood about 16 tractors for 1,000 hectares, as against the world average of 19 tractors and that in USA 27 tractors per one thousand hectare of cropped area. According to FAO (2010) the three East African counties - Kenya, Uganda and Tanzania each had more tractors in use than India in 1960. But the situation has changed of which by 2005; India had 100 times more tractors in use than all three countries combined. It owns the largest Tractor Industry in the world, accounting for one- third of the total global production from which even Tanzania imports tractor for her farmers though not consistent. While FAO (2007) indicated that tractor imports in Tanzania have dropped from 1,143 tractors in 1985 to 274 in 2002. Statistics for 2007 by the World Bank indicate that the number of agricultural machinery, tractors per 100 square km of arable land in Tanzania has dropped from 13 in 1980 to 8 in 1995 before if started rising up to 25 in 2002. To the contrary India has maintained a steady increase from 23 to 153 during the same period. The number of machinery, per 100 km² of arable land within the case study countries for eleven years by 2002 is summarized in Figure. 2.10. And the current estimates (Kibuuka 2014) suggest that Tanzania was currently likely to have about 2 tractors per 1,000 ha of arable land against the global average of 19.7 tractors per 1,000 hectares.

Figure 2.10: Agricultural Machinery, tractors per 100 km² of arable land in India and Tanzania



Source: W.B. 2016; World Bank Development Indicators

Agriculture mechanization within both countries is constrained by various factors including lack of political will, corruption, uncommitted staff within the respective government departments, etc. Lyimo (2011) listed eight main constraints to the development of mechanization in Tanzania viz. (i) low purchasing power of most small scale farmers; (ii) Low producer prices, high cost of agricultural machinery, lack of agricultural credit; (iii) lack of well trained operators and mechanics for farm machinery; (iv) lack of suitable machinery packages for main agricultural operations; (v) importation of tools, equipment and machinery of poor quality; (vi) general poor technical knowhow; (vii) inadequate business knowledge and poor technical knowledge in agricultural machinery; and (viii) inadequate capital due to lack of trade financing; the list which was in line with FAO (2007) as the factors constraining farm mechanization in SSA.

Singh (2006) named among many others small size and scattered holdings of the farmers that leads to farm machinery generally to remain underutilized; poor economic condition of majority small cultivators who are not in a position to purchase the costly machinery like tractors, combine harvesters etc; lack of proper knowledge of farmers to purchase farm machinery, operate and maintain them properly leading to wrong choice – hence

uneconomical and risky; high prices of fuel extensive for running them, that causes oil based farm machinery is not desirable; lack of repair and replacement facilities especially in the remote rural areas and nature of the industry itself – seasonal which leads to farm machinery remain idle for much of the time. Kulakarni (2013) listed among others low purchasing power and fragmented land holding of farmers, low annual use of specific machinery, lack of awareness among farmers especially in hilly, backward and tribal areas and proper sell outlets and maintenance facility in nearby areas whereby a buyer has to travel long distances for procurement, repair and maintenance; quality and reliability of farm machinery being manufactured and supplied by various agencies and scale of manufacturers are yet to gain confidence of common farmer as the setbacks of the program in India.

2.9.7 Irrigation Farming Promotion

Effective farm produce can be achieved upon application of several factors viz. certified high yielding seeds, fertilizers, mechanization, etc. but the year round production can only be assured through irrigation farming. Irrigation is one of the most important inputs required at different critical stages of plant growth of various crops for optimum production (GOI, 2012a). This type of farming ensures not only production throughout a year but also sustainable development as it is environmentally friendly. Both India and Tanzania have a great potential of varsity resources (natural rivers, dams, lakes and/or oceans) that could provide water for farming. Nevertheless this type of farming has one major drawback of high initial costs for constructing infrastructures (canals or wells) and acquiring other equipment, pumps, pipelines, valves and pressure regulators which in deed cannot be afforded by individual small and medium farmers. This necessitates government support (Kulakarni 2013) in the form of subsidy to compensate for the high initial cost of the system.

The current situations of irrigation within the case study countries are varying depending on both the nature of land and government inventiveness. In India according to Mala (2013) the rain fed areas, constitute 70 percent of the cultivated areas. With reference to NARBAD (2015), about 35 per cent of cropped area in the country is irrigated although the ultimate irrigation potential is estimated at about 140 million ha. This has created a wide gap (about 15 percent) between that irrigation potential created and that being utilized. In view of this

the central government (NARBAD 2015) aims to irrigate every farmer's field and improve the efficiency of water use to provide 'per drop more crop'. This could be testified in the Union Budget 2015–16 where ₹ 53 billion ($826 million) has been allocated to support micro irrigation, watershed development and the Pradhan Mantri Krishi Sinchai Yojana. Small and marginal farmers, who lack the wherewithal to acquire micro- and minor irrigation infrastructure, have benefited from the irrigation infrastructure created by state governments through funding by NABARD under the Rural Infrastructure Development Fund (RIDF).

In Tanzania according to URT et al, (2012) Tanzania mainland had a total irrigation potential of 29.4 million ha, while in Zanzibar the potential area for irrigation is 8,500 ha. But only 0.33 million ha about 1.13 percent in Mainland and 700 ha about 8.24 percent in Zanzibar were currently under irrigation respectively. This was supported by Charles, (2010) who reported that only less than 20 percent of arable land within the country was cultivated and even less than 7 percent was under irrigation. It is just in 2014 the irrigation services have received extensive government consideration by constituting the National Irrigation Commission under the National Irrigation Act No. 5 of 2013 as an independent department of the Government under the Ministry responsible for irrigation. By the year 2015-16 the commission was still under preparatory strategies.

According to FAO the arable land is calculated on three years average; simple sum of arable land and land equipped for irrigation by regions / sub-regions, then the sum of land equipped for irrigation is divided by the sum of arable land and the result is multiplied by hundred.

As it can be observed in Table 2.18 the percent of arable land equipped for irrigation within India has maintained a steady increase from 39.6 percent in 2004 to 42.7 percent in 2013 respectively making them to lead (as twice as much) far above the world's ratio but ranging very nearly to its respective region's ratios. This means they have devoted remarkable efforts and resources to such aspect for the sector development. In Tanzania it has remained below 5 percent while dropping from 2.1 percent in 2004 to 1.4 percent in 2013 respectively.

Table 2.18: Percent of arable land equipped for irrigation within the case study countries and their respective regions

Year	World	South Asia	India	S.S Africa	Tanzania
2004	21.6	54.5	39.6	3.9	2.1
2005	21.9	55.6	40.1	3.8	2.0
2006	22.1	56.8	40.6	3.8	1.9
2007	22.3	57.5	41.1	3.8	1.9
2008	22.5	58.8	41.6	3.7	1.8
2009	22.6	60.3	41.9	3.7	1.7
2010	22.8	61.7	42.2	3.7	1.6
2011	23.1	62.2	42.4	3.0	1.6
2012	23.0	62.4	42.6	3.0	1.5
2013	23.0	62.6	42.7	3.0	1.4
Average*	**22.5**	**59.2**	**41.5**	**3.5**	**1.8**

Source: FAOSTAT 2016, Author's computations

However, Tanzania is lagging far away from both the world as well as the respective region with an average of less than 2 percent of arable land equipped for irrigation. This may have been due to fewer resources allocated to this sub-sector resulting from inadequate government attention to the agriculture sector as a whole.

2.9.8 Post Harvest Losses Management Trends and current status

Apart from use of modern agricultural tools, application of fertilizers, use of certified high yielding seeds, etc, postharvest losses management is another important aspect for promoting agricultural productivity growth. Grain postharvest losses are currently the prevailing issue facing many farmers particularly small and medium size all over the world. The problem has both direct and indirect effects to both farmers and non farmers as it drains food from reaching the market. This in turn leads to loss of income by farmers but high prices of such a few foodstuffs that reach into the market. According to Rembold et al (2011) they may be either in physical form (loss of weight and quality) suffered during postharvest handling operations or economical form (loss of opportunity as a resulting from inability of producers to access markets) due to, for example, sub-standard quality grain or inadequate market information. Research suggests that almost one – third of world's agricultural production is wasted and does not reach the final consumer. Both of the case study countries are exposed

to the problem though at different levels. In Tanzania According to the APHLIS, the losses are ranging from 20 to 40 percent against the world's standard of 2 to 5 percent. To date, according to TMP (2013) a total of 40 percent of the annual national production of cereals is lost due to post harvest losses in the country. Several reasons are associated with this, but the most is lack of adequate storage facilities specifically in rural areas. The AgFiMS (2012) noted that lack of storage facilities – in rural areas, refrigeration for processors; existence of untrustworthy middlemen and fraudulent auctioneer for Urban-based processors as the major challenges in the chain of PHL management in Tanzania. In India according to Kulakarni (2013) the present level of post-production losses was 5 to 15 percent in durables, 20 to30 percent in semi-perishables and 30 to 40 percent in perishables. They were also above the world's standard of 2 to 5 percent. Because of that both countries have been struggling to control and reduce the problem through different means like construction of storage facilities.

However, they are still lagging behind the world's standards and countries in the developing regions. Tanzania is facing a dearth of storage facilities. Statistics for 2013 by TMP indicate that Tanzania had a total of 1,260 warehouses compared to the actual demand from the approximately 11,000 villages. The report further warns that even the available ones are not accessible to farmers' use due to different reasons including being put under private ownership for other purposes.

In India, initiatives done by the government to restrain the problem at least are visible. The India 2009 reports that a capital investment subsidy scheme titled 'Construction of Rural Godowns' is being implemented w.e.f. 1 April 2001 aiming to create scientific storage capacity with allied facilities in rural areas to meet various requirements of farmers for storing farm produce, processed farm produce, agricultural inputs, etc., and preventing of distress sale by creating the facility of pledge loan and marketing credit. According to Reddy (2012), based on the recommendations of the All-India Rural Credit Survey Committee Report (1951-52) the government constituted the central warehousing corporation (CWC) in 1957 aiming to reduce wastage and losses of agricultural produce. To date, (CWC, 2015) the corporation is operating 465 warehouses across the country with storage capacity of 11.59 million tons providing a wide range of warehousing services for agricultural produce and

sophisticated industrial products. It has been helping farmers not only to store their produce but also accessing financial facilities. However, several stakeholders especially small farmers have not been covered with such service yet. According to GOI (2013), Most of the smallholders sell their produce immediately after harvest, consistently at lower prices and later buy the commodities during the lean season at much higher prices. This is partly due to smallholders need for cash and partly due to lack of adequate technologies and facilities for post harvest handling, storage and processing.

2.9.9 Agriculture Insurance Support

Agriculture is restrained by vagaries of weather, pests, marketing and poor infrastructure that result into crop failure and adverse effects on the farmers' economic conditions respectively. Crops failure may occur due to various factors such natural calamities which may take either of the following form: drought, floods, cyclone or pests individually or as a combination. In most cases when it occurs, majority of the farmers lose their crops and money for future cropping. Agricultural stakeholders within the case study countries are highly susceptible to both natural risks like pests, droughts and floods and economic risks like insufficient financial facilities, poor infrastructure – roads and marketing. This necessitates acute protection to farmers from these calamities to ensure their food security, income flow and credit eligibility for their future economical plans. This can be achieved upon establishing respective agriculture insurance schemes as risk transfer measures in the entire strategy of agricultural risk management. According to Mogues et al. (2012) the poorest agricultural populations whose livelihoods depend on agriculture, have a high demand for agricultural insurance since in most cases are least able to bear such risk.

2.9.9.1 Agriculture insurance in India

To insure farmers against natural calamities, (NABARD) the Government of India from time to time has been introducing different crop insurance schemes throughout the country viz. National Agricultural Insurance Scheme (NAIS) / Rashtriya Krishi Bima Yojana (RKBY); Varsha Bima / Rainfall Insurance; Rainfall Insurance Scheme for Coffee Growers (RISC); WBCIS - Weather Based Crop Insurance Scheme; Rabi Weather Insurance; Potato crop Insurance; Bio-Fuel Tree/Plant Insurance; Pulpwood Tree Insurance; Rubber Insurance; and

Coconut Palm Insurance Scheme. According to Rajikumar, (2008), the general insurance business in India was nationalized in 1973 under the general insurance corporation of India (GIC) aiming to spread the service throughout the country. In 1974-75 two agricultural policies among many others (i.e. cattle insurance and Agricultural Pump Set Insurance) were introduced. Ten years later, the first systematic crop insurance schemes implemented on a wider scheme- the Comprehensive Crop Insurance Scheme (CCIS) was introduced targeting to manage risks in agriculture by providing relief to farmers who sustained crop losses caused by natural catastrophe and calamities also as an integral part of policy package for overall growth of agriculture and it productivity.

Today (NABARD), there are a number of agriculture insurance schemes including:

i) National agriculture insurance scheme (NAIS) – (1999-2000)
ii) Agriculture insurance Company Limited (AICL) –(2002) it covers all farmers
iii) Rainfall Insurance Scheme (Varsha Bima) (2004)
iv) Pilot scheme on seed crop insurance (PSSCI) (1999- 2000)
v) Farm Income insurance scheme (FIIS) 2003-2004
vi) Livestock insurance/ Cattle Insurance Scheme (1974) for cows, buffaloes, calve bulls, etc.
vii) Non crop insurance scheme

Further, with reference to SFSA (2014), over the last 10 years index insurance has grown to enable access to agricultural credit for over 22 million farmers, unlocking a value of 3.1 billion US$ in agricultural investment within the country. With reference to the NABARD (2014b), during 2013- 14, a Central Sector Scheme of National Crop Insurance Programme (NCIP)/Rashtriya Fasal Bima Karyakram (RFBK) was formulated by merging Modified National Agriculture Insurance Scheme (MNAIS), Weather Based Crop Insurance Scheme (WBCIS) and Coconut Palm Insurance Scheme (CPIS). Whereby the insurance premium payable by the farmers had to be financed by the loan disbursing office of the bank and treated as a component of scale of finance for the purpose of obtaining loan. With reference to Agriculture Insurance Company Ltd of India, the premium rates vary from 1.5 percent to 3.5 percent of sum assured for food crops, while for horticultural and commercial crops,

actuarial rates are charged and small and marginal farmers are entitled to a subsidy of 50 percent of the premium charged. This subsidy is shared equally between the Government of India and the States.

2.9.9.2 Agriculture insurance in Tanzania

Concerning insuring agriculture in Tanzania the situation is even worse. Smallholder farmers are the most vulnerable to agriculture risks such as weather risks, access to markets, infrastructure, price fluctuation and the lack of finance. The AgFiMS (2012) suggested insurance as the risk hedging tool to address the issues. However, they warn that financial institutions continue to consider smallholders too risky to lend to. Unfortunately, this aspect was not considered by the government in her efforts to promote the agriculture sector. By December 2016 there was no any insurance scheme relevant to agriculture be it under the government or private sector. This was testified by Hougaard et al (2012) thus, by 2010, there was no separate business class for agricultural insurance in the Tanzania Insurance Regulatory Authority (TIRA's) reporting requirements, which means that any premiums would be reported in the "Other general" class that makes up only 3 percent of total general insurance premiums by that time. Hougaard et al (2012) further reported that despite the importance of agriculture in the livelihoods of most Tanzanians, agricultural insurance products, already limited in the market at large, are virtually absent in the micro insurance market. Thus, the only notable exception picked up is a weather index insurance scheme that is being rolled out by MicroEnsure and the Gatsby Foundation, with underwriting by Golden Crescent. The scheme is still at pilot stage, making it premature to conclude on successes and lessons. According to the Daily News, 18th January 2007, Tanzania launched the first trial service of insurance to small- holder farmers in January 2007 that was carried out within two districts in Manyara Region out of 114 districts by that time. However, to date there is no any updates nor relevant specific details have been published on the development of this trial service since then. This is supported by Akyoo et al (2013) in the Time Journals of Agriculture and Veterinary Sciences Vol. 1(1) p.12 July 2013. Consequently absence of a labor market and imperfections in other markets force farmers in Tanzania to rely more heavily on traditional crop-management strategies to cope with production risk. Hazell et al. (1986) reported that traditionally, farmers have evolved several ways to deal with disaster

viz. selling part of their assets (such as livestock), using on-farm stocks and family savings, and seasonally migrating to places where there is work, sending money to those who stay on the farm. Nevertheless, with significant contribution of agriculture to the country's economy and 38 percent of adults reporting hunger due to drought as their third biggest risk, (SFSA, 2014), the value of having an agricultural insurance product is apparent.

2.9.10 Existence of Special Agricultural Banking and Credits

Almost every activity under this world would only be done successfully upon availability of an essential resource –fund or finance or money. When it is not sufficient, one needs to seek alternatives - credit. For agriculture finance is required by both producers and consumers in both rural and urban areas for their daily prerequisites and productive activities and it could be easier for them if there existed special agriculture and/or rural development banks to facilitate their banking and credit under special consideration.

In India, the National Bank for Agriculture and Rural Development (NABARD) is a financial institution with a focus on development as a whole. NABARD is the India's specialized bank for Agriculture and Rural Development in the country having headquarters based in Mumbai (Maharashtra) and several branches all over the country. It was established by act 61, 1981 of Parliament on 12 July 1982 to implement the National Bank for Agriculture and Rural Development Act 1981 replacing the Agricultural Credit Department (ACD) and Rural Planning and Credit Cell (RPCC) of Reserve Bank of India, and Agricultural Refinance and Development Corporation (ARDC). It is one of the premier agencies to provide credit in rural areas. The bank was set up with an initial capital of ₹ 1bln ($15.87 million). According to NANBARD itself, resulting to the revision in the composition of share capital between Government of India and RBI, the paid up capital as on 31 March 2015, stood at ₹ 50bln ($794 million) with Government of India holding ₹ 49.8bln ($791 million) equivalent to 99.60 percent and Reserve Bank of India ₹200 Million ($3.2 million) equivalent to 0.40 percent. According to NABARD (2014b), its financial operations and development initiatives are placed broadly on three planks, institutions, people and state but it focuses mainly on the people with small means.

With reference to NABARD, the bank has three main functions viz. financial, developmental and supervisory. From the financial functionality, there are two sub functions – refinancing and direct finance. The refinancing deals with (1) Short & Medium Term loans; (2) Long Term loans; and (3) Eligible schemes for refinance under NFS. Through the direct refinancing function, the bank offers: (i) Loans for Food Parks and Food Processing Units in Designated Food Parksnew; (ii) Loans to Warehouses, Cold Storage and Cold; (ii) Chain Infrastructure; (iii) Credit Facilities to Marketing Federations; (iv) Rural Infrastructure Development Fund; (v) Direct Refinance to Cooperative Banks; (vi) Financing and Supporting Producer Organizations; and (vii) More in Direct Finance.

From the developmental functionality, the bank has eight sub functions focusing on: (i) Institutional Development; (ii) Farm Sector; (iii) Off Farm Sector Development; (iv) Financial Inclusion; (v) Micro Credit Innovations; (vi) Research and Development; (viii) Core Banking Solution to Co-operative Banks; and (viii) Climate Change.

And the last is the supervisory function particularly for supervising all activities financed by the bank. With reference to NABARD (2014b), the total financial support to targeted beneficiaries during 2013-14 stood at ₹12,700 billion ($2,016 billion) compared to ₹1,039 billion (U$16.5billion) extended during 2012-13, registering an increase of 23 per cent. During the same year, a provisional of ₹8,406 billion ($129.323 billion) of credits was reported to have been disbursed by banks to the agriculture sector, as compared to a target of ₹8,000 billion ($123.077 billion) at the ratio of ₹5,997 billion ($92.262 billion) from Commercial banks, ₹1,385 billion ($21.308 billion) from cooperative banks and ₹1,024 billion ($15.754 billion) from RRBs respectively. According to NABARD, the charged lending interest rates are as low as between 4.5 to 10.5 percent depending on the nature of the credit. This is in line with the World Bank Statistics for 2015 which suggested it at only 10 percent.

In Tanzania the situation is different. Up to early August 2015 the country had no functioning bank or financial institution special to facilitate attainment of food self-sufficiency and security, transformation of the agricultural sector from subsistence to commercial farming,

and bringing about economic development and poverty reduction through the sector. According to Mumero, (2015), the Tanzania Agricultural Development Bank Limited (TADB) was officially launched on Friday 7th August 2015 by the country president with a view to bring a focused approach to financing farmers in line with the national goals enshrined in the Tanzania Vision 2025. The government has pledged to provide TSh 850bln ($389 million) as a working capital. This is far less (about 63 percent) compared to that provided by Indian government for the same purposes. Further, newly established agricultural bank has not stabilized yet; it has only one branch in Dar es Salaam. The lending interest rates in Tanzania are considered to be high compared to its counterpart India. Statistics for 2015 by World Bank suggested that the general lending interest rates in Tanzania stood at 16.1 percent compared to that of India that was only 10 percent during the same period.

2.9.11 Agricultural Marketing support

Access to markets is a critical success factor for any business AgFiMS (2012). For effective delivery of agricultural produce from the farmer to the consumer agriculture market assumes the significance role.

Existence of efficient agricultural marketing system for the development of the agriculture sector will help to provide outlets and incentives for increased production and contribute to the commercialization of subsistence agriculture. This was insisted by Desai (2012) that remote villages need free flow of goods and services in order to avoid market apportionment problems. This helps to provide them marketing services for both input supplies and output sales.

In India according to NABARD (2015) agricultural markets in most parts of the country are established and regulated under the State Agricultural Produce Market Committee (APMC) Acts. There are around 7,000 regulated markets and 22,000 rural primary markets in the country**.** The country also has about 2,477 principal regulated markets and 4,843 sub-market yards regulated by the respective Agricultural Produce Marketing Committees (APMCs) NABARD added. Nevertheless, there is a wide gap between the place of production and the place of consumption. Hence the function of market information assumes the importance

warns Reddy (2012). According to Reddy, collection and spread of market information in India it is the duty of the government through the directorate of Economics and Statistics, Ministry of food and agriculture. The agency publishes some journals, and reports containing market information. Also some of the state governments publish monthly magazines that contain detailed information about agriculture marketing situation in the respective state.

In Tanzania it is the duty of government to gather and extend the market information through the National Bureau Statistics (NBS). Unfortunately, most of them have been historical with low impact to respective stakeholders particularly farmers in their daily dealings.

Generally, agricultural commodities move from farm to the final consumer through several channels varying depending on the nature of a particular commodity. Most of the individual farmers within the case study countries lack both infrastructure and transportation facilities to ferry their produce to the markets. The situation forces them to sell their produce to intermediaries at low prices as compared to those at the wholesale markets. Storage and warehousing is a critical issue to many rural people within both countries.

In India (NABARD), actual buying and selling of the products takes place mainly in the market yards and sub yards (primary and secondary wholesale markets) and rural periodic markets commonly known as haats spread all over the country. However, according to the ministry of Agriculture of India imperfect market conditions, restrictions on the movement of agricultural commodities due to infrastructural constraints, transport bottlenecks and local taxes were termed as the major influence of the retail prices trends across the major markets and consumption centers.

In Tanzania rural infrastructure in the country is still inadequate to effectively and efficiently support agricultural marketing. Poor rural roads and inadequacy of communication facilities limit farmers' access to markets, dissemination of knowledge and marketing information increase time and cost of transport that often result in deterioration of produce quality. The URT, (2008a) reports that agricultural marketing is also adversely affected by lack of marketing structures, poor linkages within the marketing, processing and production chains,

poor market-orientation and inadequate processing facilities leading to high levels of produce wastage. Singh, (2011) observed that transport costs in Africa are very high due to inadequate infrastructure and monopolistic behavior by economic agents. According to Singh while the cost for transporting a ton of maize over 11,000km from U.S to Mombasa ranges from $45 to $48, the transport cost from Mombasa to Mbarara in Uganda a 1,500km distance ranges from $125 to $140.

To strengthen infrastructure for marketing, grading, standardization and quality certification of produce in the agriculture and allied sectors, the government of India has established the Scheme on Agricultural Marketing Infrastructure, Grading and Standardization under the Directorate of Marketing and Inspection (DMI) since October 2004. According to NABARD (2014b), during the year 2013-14 a subsidy of ₹18.8 billion ($ 310 Million) was released in respect of 1,119 units. Cumulatively, ₹8.07 Billion ($133.4 Million) was released as on 31 March 2014 for 7,250 units.

Conversely, agricultural products in Tanzania (URT 2008a), to a large extent, are characterized by inadequate adherence to the set product quality standards, grades and inadequate post harvest management. Some market stakeholders violate set standard units of weights and product grades. This has been associated with an inability to adhere to food hygiene and sanitary and phytosanitary requirements, which limits on participation not only in global markets but also regional as well as domestic markets. Also concerning value addition in Tanzania is still worse. In the words of URT, (2008a), majority of crops in the country are marketed in their raw forms, losing opportunities for higher earnings and generating employment due to various constraints facing the agro-processing industry viz. high operational costs mainly because of high prices of imported fuel and spare parts, unavailability of appropriate processing machines and spare parts and limited knowledge in operation of the machines. With reference to Singh (2008) in the LIMCA book of records, India owns one of the world's largest fruit and vegetable project – Mother Dairy Fruit and Vegetable Ltd formed in 2000 in Delhi with an annual capacity of 120,000 tones and a chain of 300 retail outlets in and around Delhi. While there is no specific market for fruits and vegetables being ran by the government of Tanzania, in India, according to Singh (2008)

there is also the world largest fruit and vegetable with 76 acre yard and annual capacity of 460,000 tones located at Azadpur, Delhi constructed by the Delhi Development authority in 1977 and handles over 15,000 tones of fruits and vegetables daily connecting about 100,000 people for trade daily.

With reference to GoI, (2014) organized marketing of agricultural commodities has been promoted in the country through a network of regulated markets to ensure reasonable gains to the farmers and consumers by creating conducive market environment for fair play of the forces of demand and supply. However, they regret that they do not have required facilities/amenities available therein due to resource constraints. The India 2009 reference manual: With a view to establish a nation-wide information network for speedy collection and dissemination of price and market related information to farmers, electronic connectivity is being provided to all important agricultural markets in the country under a Central scheme, **'**Market Research and Information Network'. 2,408 market nodes and 92 State Marketing Boards and Directorate of Marketing and Inspection offices have been networked on a single portal, wherein daily prices of more than 300 commodities and about 2,000 varieties are being reported. It is planned to connect 2,700 markets in all, under the scheme during the 10^{th} Plan.

According to India 2009 reference manual the Department of Agriculture and Cooperation has three organizations namely, the Directorate of Marketing and Inspection (DMI), Faridabad, the Ch. Charan Singh National Institute of Agricultural Marketing (NIAM), Jaipur and the Small Farmers Agri-Business Consortium (SFAC), New Delhi dealing with marketing under its administrative control. The Directorate of Marketing and Inspection is an attached office of the Department of Agriculture and Cooperation headed by Agricultural Marketing Adviser with its Head Office at Faridabad (Haryana), Branch Head Office at Nagpur (Maharashtra), 11 Regional Offices and the Central Agmark Laboratory at Nagpur. Besides, there are 26 Sub-Offices, 16 Regional Agmark Laboratories (RALs) spread all over the country. The main functions of the Directorate include inter alia: (i) Rendering advice on statutory regulation, development and management of agricultural produce markets to the states/UTs; (ii) Promotion of Standardization and Grading of agricultural and allied produce

under the Agricultural Produce (Grading and Marking) Act, 1937; (iii) Market Research, surveys and Planning; (iv) Training of personnel in Agricultural Marketing; (v) Marketing Extension; (vi) Agricultural Marketing Information Network; (vii) Construction of Rural Godowns; and (viii) Development of Agricultural Marketing Infrastructure.

The country also has a special Agricultural Marketing training institute - The National Institute of Agricultural Marketing (NIAM) established in August 1988 in Jaipur (Rajasthan) for conveying training to farmers on marketing management. NIAM has been imparting training to senior and middle level executives of agricultural and horticultural departments, Agro Industries, Corporations, State Marketing Boards, Agricultural Produce Market Committees and Apex level Cooperatives, Commodity Boards, export houses recognized by Agricultural and Processed Food Products Export Development Agency (APEDA), Commercial Banks and non-governmental organizations. The main objectives of NIAM are: (1) To provide specialized training in agricultural marketing designed to develop leadership potential in the management of agricultural marketing enterprises and services; (2) To undertake research in agricultural marketing for Government, Cooperative and other Institutes, both on public funding and by contract; (3) To undertake appraisal of markets/marketing projects for approval and financial support by the Central Government, on consultancy basis; (4) To formulate objective criteria for selective development of physical markets and to evolve a practical methodology for the application of such criteria in their planning; (5) To offer advisory and consultant services on marketing policies, investment programmes and marketing development strategies and specific advice to marketing enterprises (State, Private and Cooperatives); (6) To survey, study and analyze the rural market management and to examine in depth the principal and practice of market regulation as a development sector in the agricultural economy.

In Tanzania to date there is neither specific price regulatory board/committee for grains and horticulture produce nor special Agricultural Marketing training institute. There is only one agricultural university Sokoine University of Agriculture that provides general agriculture education in different disciplines. The government (URT, 2008a) admits marketing concerns usually appear later when the output has already been realized due to inadequate agricultural

marketing extension services. Consequently, due to lack of relevant skills many smallholder farmers produce crops which they have been producing traditionally, and subsequently continue searching for markets of these products, even when the market requires improved or entirely different products.

2.9.12 Food security and self sufficient statuses in the study area

According to the World Food Summit (1996) as quoted by FAO, food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.
Based on such definition, four widely accepted dimensions of food security were set by such World Food Summit:

Food availability: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).

Food access: Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).

Food Utilization: Utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.

Food Stability: To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.

The opposite of that has also been defined by FAO as food insecurity - a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life.

Food insecurity has remained a global crisis that demands precious combined efforts both individual countries and the international community commitment to be addressed successfully. A report by IFPRI (2015) indicate that despite the lower hunger level reflected by the nominal calculations of the global hunger index (GHI) score, the number of hungry people in the world remains unacceptable y high.

According to Dev & Sharma (2010), food security is harmonized by three components; availability, access, and absorption (nutrition). These factors are further complemented by numerous of factors viz. (i) availability of farming inputs at affordable prices; (ii) infrastructure – roads, electricity; (iii) storage facilities; and, (iv) postharvest management system. On the other hand food self-sufficiency was defined by FAO as the ability of an individual or states' population to meet consumption needs (particularly for staple food crops) from own production rather than by buying or importing. The current situation within the case study countries prove that although both of the case study countries have indicated promising trends of food productions in some of their areas during last few years, there still exists challenges facing them to meet their respective population food demand throughout annual seasons. This can be testified by the Statistics from both FAO and the World Bank respectively.

As it is observed in Table 2.19 Tanzania has been lagging behind India in all four major cereal farm produce (wheat, maize, beans dry and beans green) for the period of the last fourteen years up to 2014 with low average annual production in tones as shown in the table respectively. Reasons for such low production include low per hectare fertilizer consumption, inadequate agriculture mechanization and dependence on rain fed farming.

Table 2.19: Food Grains Production Trends ('000') Tones in India and Tanzania

	Wheat		Maize		Beans Dry		Beans Green		Rice Paddy	
Year	India	Tanzania	India	Tanzania	India	Tanzania	India	Tanzania	India	Tanzania
2005	68,637	102	14,710	3,132	2,631	626	505	1	137,690	1,168
2006	69,354	110	15,097	3,423	3,270	708	522	1	139,137	1,206
2007	75,807	83	18,955	3,659	3,930	889	538	3	144,570	1,342
2008	78,570	43	19,731	5,441	3,010	571	554	4	148,036	1,421
2009	80,679	82	16,720	3,326	2,430	774	571	3	135,673	1,335
2010	80,804	62	21,726	4,733	4,890	868	586	3	143,963	2,650
2011	86,874	113	21,760	4,341	4,330	676	601	4	157,900	2,248
2012	94,880	109	22,260	5,104	3,710	1,199	620	4	157,800	1,801
2013	93,510	104	23,290	5,356	3,630	1,114	620	5	159,200	2,195
2014	95,850	167	23,670	6,737	4,110	1,115	636	6	157,200	2,621

Source: FAOSTAT 2016; Food-Security-Statistics@FAO.org

Because the demand of cereals is always high while production trends going down, the country has remained forced to import the missing portion of the cereals leading to high cereal import dependency ratio. See Table 2.20.

According to FAO cereal import dependency ratio presents the percentage of import over the total cereal production and import net of cereal exported.

It is calculated by FAO on three years rate as follows:

$$r = \frac{cereal\ imports}{(cereal\ production + cereal\ import - cereal\ export)} x100;.$$

Table 2.20: Cereal import dependency ratio (%) for India and Tanzania

Year	World	Tanzania	India
2005	-0.2	10.4	-4.1
2006	-0.2	12.2	-2.3
2007	-0.2	11.6	-2.1
2008	-0.1	10.3	-2.2
2009	-0.2	10.0	-3.1
2010	-0.2	11.0	-2.7
2011	-0.2	13.2	-3.1
2012	40.5	12.1	-2.6

Source: FAOSTAT 2016; Food-Security-Statistics@FAO.org

From Table 2.20 while both the world and India have managed not to import any cereal for almost the entire period of eight years from 2005 to 2012, the situation was different for Tanzania as it was steadily amplified from 10.4 to 13.2 percent respectively during the same period. It means Tanzania have a great potential of increasing their productivity by injecting more funds up to 14 percent of the total government expenditure a year while limiting importations

Viewed from the general cereal production within the case study countries, Tanzania has not done well. While India has maintained a steady rate of production increase from 2,447 kg/ha in 2006 up to 3,122 kg/ha in 2015, Tanzania cereal yield trends were increasing though in a fluctuation way from 1,327 kg/ha in 2006 up to 1,790 kg/ha in 2015 as it can be observed in Table 2.21.

This has intensified the food deficit (kcal/caput/day). According to FAO, the depth of food deficit indicates how many calories would be needed to lift the undernourished from their status, everything else being constant. According to food security statistics by FAO, while both the world and India have managed to drop it from 128 and 167 to 83 and 121 respectively during the period of twenty two years 1990 to 2011, for Tanzania, it has raised up from 180 in 1990 up to 221 in 2011 respectively.

Table 2.21: Cereal yield Trend (Kg /ha) in India and Tanzania for 10 years up to 2015

FY	Tanzania	India
2006	1,327	2,447
2007	1,427	2,583
2008	1,334	2,638
2009	1,110	2,581
2010	1,648	2,676
2011	1,390	2,861
2012	1,319	3,010
2013	1,418	2,963
2014	1,660	2,981
2015	1,790	3,122

Source: WB, 2016: World Development Indicators

From Table 2.21 Tanzania general cereal production has increased by almost 35 percent for the period between 2006 and 2015, in India it has increased by more than 28 percent during the same period. Several reasons can be related with this situation including poor agricultural technology which has always been focusing on increasing the area of farming rather due to low farming skills of most of farmer.

Further, statistics by FAOSTAT indicate that Tanzania has recorded a high average value of food imports (29%) over total merchandise exports (excluding fish) for the last eighteen years up to 2010 compared to India whose value was 5% during the same period. This means that much more resources are spent for foodstuff importation in Tanzania rather than promotion of foodstuff production.

Such low production has resulted into a limited per capita value of food production (average value of food production) within those countries. According to FAO, the Per capita Value of Food Production (average value of Food Production) within both case study countries has remained far low from the world standards. The total value of Annual Food Production, is estimated by FAO in International Dollars (I $) divided by the total population calculated on 3 year averages. It provides a cross country comparable measure of the relative economic size of the food production sector in a particular country.

Both of the case study countries are food insecure now and in future though at different levels. Studies by Dev & Sharma (2010) observed that India has malnutrition levels as twice as those of many countries in Africa. In Tanzania, the URT (2010) reported that findings of two Rapid (food) Vulnerability Assessments in September 2009 and February 2010 have revealed 1,569,890 people in 59 LGAs out of 65 LGAs of 16 Regions; and 717,684 in 34 LGAs of 9 surveyed Regions of Tanzania Mainland to have been food insecure respectively.

The food deficit has a direct negative impact to the variation of the domestic food price level (domestic food price volatility). Countries are forced to import foodstuffs to persuade their population demand. In rare cases we can expect low or affordable prices on that kind of foodstuffs. It is obvious that imported foods are exposed to various costs ranging from

transportation to importation duties all of which are to be absorbed by the final consumer. Statistics by FAO indicate that food prices within both of the case study countries are considered to be volatile at increasing trends with time compared to the world standards which has been recording a slight decrease of food prices (See Table 2.22). They are as high to be affordable by low income earning households. According to FAO the Domestic Food Price Volatility is a measure of variation of the Domestic Food Price Level Index across a country within a particular time. It is computed as the Standard Deviation (SD) of the deviations from the trend over the previous five years.

Table 2.22: Domestic Food Price Volatility (index)

Year	World	Tanzania	India
2007	5.6	11.0	4.7
2008	6.8	8.1	6.8
2009	9.9	8.5	7.7
2010	6.5	12.0	3.5
2011	5.7	4.9	3.0
2012	6.9	4.9	5.0
2013	7.8	7.0	6.4
2014	6.4	4.8	8.4

Source: FAOSTAT 2016; Food-Security-Statistics

From Table 2.22 the Domestic Food Price Volatility in Tanzania is as high as twice that of the world's standard. This means foods are less accessible or affordable in Tanzania compared to her counterpart.

With reference to the URT (2010), although FSSR has fluctuated between 88 and 112 percent in 2003-04 and 2009-10 respectively, there existed significant variations in food security between different regions and districts depending on a particular season's conditions from time to time. The major reason here is dependence of rain fed farming. During good seasons (with adequate rainfall), the country could managed to produce enough food to meet both domestic requirements and export surpluses to neighboring countries. During poor seasons, the situation becomes even worst as the country as a whole becomes vulnerable to serious food shortages due to low production. Generally the number of regions with food

surplus is always as far as less than one quarter of all country's regions. Based on the 2009-10 report, the number of regions with food surplus (FSSR>120) was five compared to eleven regions which experienced food shortage within the same year. The main causes of such seasonal variations in production and supply is not only dependence on uncertain rainfalls but also poor infrastructure networks. In India also it was warned by Salunkhe and Deshmush (2012) that in spite of the fact that nearly 60 percent of our working population was engaged in cultivation, the country was not self- sufficient in food grains but had to depend on food imports

Once the community is not in position to access adequate foodstuffs, they are exposed to nutrition risk. This was verified by the NEPAD (2011) in their country report for Tanzania that despite significant growth of the economy, the level of malnutrition remained high particularly for children and other vulnerable groups. Rural poor and small holder farmers have remained most vulnerable and exposed to access to food, ability to acquire food, or both; which raises further concerns about a possible disconnect between agricultural growth and nutritional outcomes. Statistics by FAO for 2016 further indicate the estimated number of people at risk of undernourishment within the case study countries and their respective regions have been behaving in a converse relationship with that of the world standard as it can be observed in Table 2.23.

Table 2.23: Number of people undernourished (millions)

Year	World	Tanzania	India
2007	122.5	14.1	233.8
2008	123.0	14.1	218.7
2009	124.3	14.3	202.5
2010	125.9	15.1	192.6
2011	126.5	15.6	189.7
2012	118.7	16.1	189.9
2013	119.2	16.0	191.0
2014	120.5	16.1	193.1
2015	122.3	16.3	194.1
2016	124.2	16.8	194.6

Source: FAOSTAT 2016; Food-Security-Statistics@FAO.org

Note:

- Number of people undernourished is calculated by FAO by applying the estimated prevalence of undernourishment to the total population in each period.
- The Prevalence of Undernourishment expresses the probability that a randomly selected individual from the population consumes an amount of calories that is insufficient to cover her/his energy requirement for an active and healthy life.

Currently (IFPRI, 2015), the percentages of undernourished populations within Tanzania and India are 32.1 and 15.7 respectively. This situation demands more efforts to improve food security within the case study countries.

Viewed from the situation of huger and access to food, in India the NSSO data suggests that the country has counted tremendous achievements by dropping the portion of households that had nothing to eat from 17.3 percent in 1983 to 2.5 percent in 2004-05. In Tanzania data by NBS (2015) suggested that for the period of twenty years from 1991-92 to 2011-12 the country has attained a notable plunging of the percentage of its population below food poverty line from 26.1 to 9.7 respectively.

From the global perspective, both Tanzania and India have shown a commendable improvement against food insufficiency and hunger by slashing their hunger indexes by more than 30 percent respectively. Data for 2017 by IFPRI indicated an improvement of the Global Hunger Index for the last two decades by the case study countries. While it has dropped from 42.1 to 28.4 for the period from 1992 to 2016 in Tanzania, in India it has dropped from 46.4 to 28.5 during the same period respectively as it can be seen in Table 2.24. However, considering their positions within their respective regions and the global rankings, both countries have not performed as well as to be commended. According to IFPRI Tanzania was ahead of India by one point in the 2017 global ranking but they both fall into the region of serious hunger indicators and far away from the world's undernourished proportion.

Viewed from their respective regions, Tanzania stood in the last position among the four East African Countries with relevant data, while India acquired the seventh position among the

eight South Asian countries as it can be observed in Table 2.24. This means both Tanzania and India were far away to meet the 2015 Millennium Development Goal I (MDG I) target of reducing the number of population below food poverty line.

Both countries have not done well in the general food security aspect. Several reasons were related to that poor performance in this scenario viz. (i) extraneous sector policy and food security policies; Food security is a crosscutting issue which needs to be mainstreamed in relevant national policies complemented with related sectoral initiatives through implementation of strategies with associated programmes and action plans linked and coordinated with one another and with initiatives of the government and development partners at national levels. (ii) Irrational allocations of public funds to lower levels from central governments. This holds back the process. Allocation of agricultural budget does not observe food security situation respectively. In Tanzania for example, according to Gabagambi, (2011), ten mainland regions namely Arusha, Kilimanjaro, Lindi, Manyara, Mara, Mwanza, Mtwara, Shinyanga, Singida and Tabora are identified as endemically food insecure places.

Table 2.24: Country Global Hunger Index Scores By Rank for Tanzania and India 1992 GHI, 200 GHI, 2008 GHI, and 2016 GHI and Their Respective Regions

Region	Rank	Country	1992	2000	2008	2016
East Africa	72	Kenya	38.5	37.6	29.6	21.9
	87	Uganda	41.3	39.4	31.2	26.4
	91	Rwanda	54.6	58.7	37.9	27.4
	96	Tanzania	42.1	42.4	32.9	28.4
South Asia	29	China	26.4	15.9	11.5	7.7
	44	Malaysia	20.1	15.5	13.4	9.7
	57	Mauritius	17.5	16.2	14.8	13.2
	72	Indonesia	35.8	25.3	28.6	21.9
	72	Nepal	43.1	36.8	29.2	21.9
	84	Sri Lanka	31.8	27.0	24.4	25.5
	97	India	46.4	38.2	36.0	28.5
	107	Pakistan	43.4	37.8	35.1	33.4

Source: IFPRI 2016

However, during 2009-10 financial year, the 10 regions which form about 50 percent of all the regions and contained 46.2 percent of the population in the country by the time were allocated only 30.2 percent of the national DADP budget; (iii) ignorance of the general public; (iv) insufficiencies of funds; and, (v) currency disparity (as discussed in details in the sector funding and budgetary allocation trends).

According to URT (2010), Tanzania is believed to be food self-sufficient and has a comparative advantage in the production of many crops. Data on aggregate national food production by URT indicates that Tanzania is not a famine-prone country, and regularly produces enough food to meet national requirements. The food self-sufficiency ratio (SSR) reflects the ability of food production to meet demand and easy computed by taking production as a percentage of requirements. According to the Poverty and Human Development Report, PHDR, (2009) since 2004-05 season, the country has been self-sufficient in food. The SSR in 2007-08 was 104%. There is a large potential for increasing production of items such as wheat and rice to replace imports and to expand food crop exports to neighboring countries. At the same time, the unexploited natural resource stock permits virtually unlimited expansion and diversification in crop and livestock production (Amani, 2004). However, the dependence on uncertain rainfalls and poor infrastructure networks has remained the major cause of seasonal disparities in agricultural production and supply. As a result, (URT 2010) food shortage problems in Tanzania is alterational in nature; in some areas there might be abundant harvest but yet the country may still be experiencing hunger in some other geographical areas leaving people having one meal a day while others unable to access it at all due to low income, poor infrastructure and poor marketing information system.

CHAPTER - 3

Literature Review

3.1 Introduction

With this section the researcher linked the previous and current knowledge, substantive findings, as well as theoretical and methodological contributions of other academicians and intellectuals in the same or related fields to a particular topic of the research under the study. From literature review the researcher gains the general understanding about the problem and a collection of ideas of different researchers or academicians, by identifying what is already known about an area of study, questions a body of research does not answer and/or making a case for why further study of research questions is important to a field.

Based on this the researcher was able to: establish a theoretical framework for the topic / subject area under study, define key terms, definitions and terminology, identify studies, models, case studies etc supporting the topic and finally to emerge with an evaluative summary report of information found in the literature related to the area of topic under study by describing, evaluating, analyzing and pave the way forward relevant to the matter under study.

3.2 Theoretical Conceptualization

Public spending is considered as one of the most effective mechanism of the governments in the efforts to promote agricultural growth and poverty reduction that can bring direct outcomes. But agriculture is a crosscutting process hence demands a combination of various factors such as adequate information - about which types of public investments contribute the

most to development goals. In most cases public resources are limited with competing demands. Therefore, with research and development (R&D) in place a person, institute or a nation will be in a position to analytically plan and decide how scarce resources should be allocated across different sectors of the economy such as agriculture, infrastructure, health, and education for maximizing development outcomes, or within a sector how should resources be distributed by priorities.

Public expenditure policies are a key for promoting economic growth and preserving a stable macroeconomic environment, which require sustainable public finances. Chan and Karim (2012) defined public spending efficiency as the ability of the government to maximize its economic activities given a level of spending, or the ability of the government to minimize its spending given a level of economic activity. Hence, public spending efficiency could be used as an indicator to evaluate the effectiveness of government policy implementation on administration, education, health, income distribution, and economic stability. It is essential for the government to spend the money collected from taxpayers efficiently, as it is accountable to its general public. The fundamental question of economics is concerned with the efficient use of scarce resources. In this context the concept of efficiency evaluates a country's allocation of resources in promoting economic growth.

The ECB, Monthly Bulletin of April 2006 argued that there should be linkages between public expenditure, economic growth and fiscal sustainability. But relevant and adequate information to guide policymakers on how best to allocate scarce public resources are limited particularly in the Sub Sahara Africa region. Fan et al, (2009), opines that in some cases African countries have clear principles on how to prioritize their scarce public resources, but they often lack the information needed to operationalize these principles.

Efficient allocation of public resources demands both adequate and relevant information and transparent public spending practices. According to Lugo (2011) reliable data on government expenditure in priority sectors, such as agriculture, health, education, is a key ingredient into the analysis of public policy effectiveness.

Agriculture is one of the most potential factors for alleviating poverty in this world through provision of food, employment and industrial products' market and raw materials – which is in line with the first Millennium Development Goal (MDG 1) of halving poverty by 2015. Singh, (2011) reported that in the agriculture –based countries particularly SSA, agriculture and its associated industries are essential to growth and to reducing mass poverty and food insecurity. We need prioritization to set policies on public spending programs in the agriculture sector and its different sub-sectors based on their prospected outcome on the poor.

3.3 Importance of public spending on agriculture

Public spending on either sector serves as an engine for economical growth and poverty reduction. Agricultural growth is the primary source of poverty reduction in most agriculture-based economies. Several studies (Cleaver 2013; Diao 2010; Fan and Saurkar 2012; Dewan and Ettlinger 2009; Mogues et al 2012; and Fan et al, 2009) have demonstrated the importance of public spending on agriculture sector. Fan et al, 2009 found that public spending is one of the most direct and effective instruments that governments can use to promote agricultural growth and poverty reduction. Dedicated public spending on agriculture can lead to a faster rate of poverty alleviation, by raising the incomes of rural cultivators and reducing food expenditure, and thus reducing income inequality. According to Mogues et al (2012) and (Fan & Breisinger 2011) public investment on agriculture has significant and visible effects on health and nutrition through three major outcomes: (i) increased production for self-consumption, in the case of subsistence farmers; (ii) reduced (low) prices for net buyers of food; and (iii) increased marketable output for agricultural producers who sell all or part of their output, thus increasing their incomes as a result of increased agricultural productivity which then offer people greater access to food. The income gains resulting from the third outcome can translate into better nutrition through greater calorie consumption and gains in dietary diversity, as well as improved health through a better ability to purchase medicine and access health services. Dewan and Ettlinger (2009) expressed public spending as an important function in pursuing economic growth objectives while ensuring that gains are widely distributed to promote broad-based increases in living standards. According to Cleaver, (2013), government action to stimulate agriculture at scale pays off by increasing food production and rural incomes. This means that for positive economic growth, rapid

poverty reduction and direct individual income growth there should be an ample government commitment and enduring but viable policies for investing to the sector as it was observed by Diao, (2010). In the words of Diao, (2010), agriculture sector has not developed without a comprehensive long term strategy and public investments. This was supported by Mogues et al (2012) and World Bank, (2008). According to Mogues et al, a 10 percent increase in the instability of total government spending on the agricultural sector causes, on average, a 0.36 percent decline in agricultural growth but a 1 percent change in agricultural expenditure as a share of GDP produces a 0.43 percent reduction in poverty. While the World Bank, (2008) demonstrates that GDP growth originating in agriculture is about four times more effective in reducing poverty than GDP growth of other sectors. The indisputable economic growth should begin from individual households as it was noted by Ravallion, (2001) that a rise in average household income by one percent leads to a fall in the poverty rates by about doubled percent on average. Both the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) and Fan et al, (2009) insisted that promoting higher agricultural growth is key in reducing poverty, promoting overall economic growth and achieving the first Millennium Development Goal (MDG) of halving the number of poor people by 2015. Fan et al, (2012 in their study titled Public Spending in Developing Countries: Trends, Determination, and Impact they found that agricultural spending, education, and roads contributed strongly to agricultural growth. They further narrated that disaggregating total agricultural expenditures into research and non-research spending reveals that research had a larger productivity enhancing impact than non-research spending. Investing in agriculture has positive results to other sectors. Mogues et al (2012) found that agricultural investments not only benefit the sector but also have indirect effects on nonagricultural sectors.

3.4 Relationships between Agriculture, Public spending and rural development

Agriculture plays a vital role in the developing countries' economy and rural development in general. Majority of the rural population depends on agriculture for their livelihood viz. food for sustenance, local income and foreign exchange. Further it is the main source of most of industries' raw materials. According to Redddy (2012) the sector contributes to capital formation for economic growth through three major ways: (i) increasing agricultural

productivity which leads to lower food prices that in turn raises real income and promotes saving; (ii) increasing farm produce which then generate higher levels of farm income, part of which may be saved for investment purposes; and, (iii) generation of capital by taxing agricultural sector related transactions – land taxes, agricultural income tax, export duty and irrigation tax. Several studies (Desai 2012; Mashindano et al. 2011; World Bank 2015; Singh 2011; and Kulakarni 2013) have categorized the sector as the major factor for development – particularly in the developing countries through different ways.

Desai (2012) viewed agriculture sector as persuade of the industrial sector on the supply side through the availability of raw materials required by the industries. He further added that in India, the sector accounts for about 36.8 percent of all commodity input directly required by the manufacturing sector. In the words of the World Bank (2015), agriculture can help reduce poverty for 78% of the world's poor, who live in rural areas and work mainly in farming through which it can raise incomes, improve food security and benefit the environment. Singh, (2011), reported that the sector contributes to development as an economic activity, as a livelihood and as a provider of environmental service. It provides investment opportunities for both private sector and prime driver of agriculture –related industries and the rural nonfarm economy. According to Singh, it provides about 29 percent of the agriculture-based India's GDP and employs 65 percentage of the labor force; it serves as a source of livelihoods for more than 85 percentage of rural people and a major player in underground water depletion, agrochemical pollution, soil exhaustion and global climate change, accounting for up to 30 percent of greenhouse gas emission. Singh, (2011) and the World Bank, (2008) together related any injection of GDP spending into agriculture as a multiplier factor in the economic and GDP growth and poverty reduction across the world. While Singh noticed that the GDP growth originating from agriculture is at least twice as effective in reducing poverty compared to that originating from other sectors, the World Bank uttered that it is about four times more effective in reducing poverty than GDP growth of other sectors. India for example, according to Singh (2011), the sector is contributing 28 percent of agricultural GDP in the economy. This was supported by Kulakarni (2013) that India is a predominantly an agricultural economy country with about 65 percent of her population living in villages who earn their livelihood through agriculture and allied activities.

According to the World Bank, rural development is a strategy designed to improve the economic and social life of a specific group of people – the rural poor i.e. small scale farmers, tenants and the landless. In other words it is the process of improving the living standard of the masses of low income population residing in rural areas making the process of rural development self-sustaining. Public spending plays a vital role for the success of the strategy, through provision of opportunities to the rural poor for better utilization of their physical and human resources. It is well known that with the effective and efficient public spending, diverse outcome are expected viz. employment creation, education, health and nutrition facilities; housing; improved social services – water supply, roads and electricity; improved agricultural inputs, skills and effective markets for agricultural produce; good governance and finally growth of the country's GDP. This is supported by Desai (2012) that good governance facilitates participatory macroeconomic management and ensures better access to basic services and greater voice and participation in the decision affecting the rural people.

There is a direct correlation between public spending on one side and agriculture and rural development on the other side. Desai (2012) observed that the greater generation of employment in the agricultural sector is linked with its growth, which is caused by both an increase in productivity and employment. Additional income in rural areas will thus be generated for the rural development and go a long way in improving the standard of living of the rural people. However, all these outcomes are expected to be facilitated by an easy access to basic services as a result of public investment. Public investment and good governance are therefore, two intertwined factors for both rural and agriculture development. Government spending is expected to be funding the governance activities viz. security and defense, social services – roads, water supply, electricity, health facilities, education, housing and land acquisition.

If facilitated properly by the respective governments – particularly within the agriculture – based countries, agriculture sector assumes the conduit like function in the overall escalation of their economic growth. Singh (2011) related agricultural productivity with determinations of food prices that in turn determine wage costs and competitiveness of the tradable sectors.

This means food staples productivity is one among other key factor to economic growth. According to Singh growth in both the non tradable and tradable sectors of agriculture induce strong growth in other sectors of the economy through multiplier effects. However, rural poverty has remained rife in most of the developing countries including the case study countries. Several factors are related to this including inadequate resources financial, human and physical like land. Despite of the vastly of idle land owned by the respective case study countries, most of the rural people suffer the problem of lack of land for their daily livelihood activities. In India, according to Desai (2012), it is the landless rural labor that forms the largest reservoir of poverty in the country, and is the source of urban poverty too. Mashindano et al. (2011) concluded that among many other, limited capital and access to financial services; inadequate agricultural technical support services; poor rural infrastructure hindering to effective rural –urban linkage; depressed prices for primary commodities in the global markets; insecurity with respect to poverty and business; rights to land and use of land as a collateral for credit are the major agricultural barriers that in turn hamper the rural development process in Tanzania. Nevertheless, most of these limiting factors are considered to be the primary responsibilities of the respective governments of the case study countries as the key players although there is a noticeable passivity.

3.5 Agriculture and GDP

Under normal circumstances the quickest answer from an ordinary person when asked about the relationship between the GDP and agriculture will be there is no direct relationship between the two aspects. However, there have been scientific proofs or evidences which indicate that there is a good interdependence between these two factors. There are a number of studies (Chilonda at el. 2009; Desai 2012; NABARD 2013; Kamuhabwa 2014; Msambichaka 2012; Mashindano 2011; SCBF 2014 and Singh 2011) that signify the correlation between the two aspects. With reference to Desai, (2012), an increase in agricultural production, increases the food grains and non food grains (mainly industrial raw materials), the marketable surplus of the food crops and the supply of the industrial raw materials. This in turn generates an additional volume of trade, transport, banking and other activities. Thus, agricultural output indirectly influences not only the growth of the industrial sector but also that of other sectors. In the words of Desai, since the growth of industrial and

the T sector – (trade, transport, banking, business service) output depends on agriculture and since GDP growth rate depends on these sectors as well, then agriculture is also directly responsible for GDP growth. The sector contributes largely to the GDP of the case study countries. With reference to the NABARD (2013) in their 2012-13 annual reports agriculture with its allied activities, accounted for 13.7 per cent of the GDP in India during that year. In Tanzania according to Mashindano 2011, Msambichaka 2012, Kamuhabwa 2014, and SFSA 2014 between 2010 and 2014 the sector contribution to the national GDP was even doubled ranging from 26 to 30 percent respectively. Based on that, Mashindano, (2011) has ranked agriculture as the leading sector within the country in terms of its size, GDP contribution, and general employment and export earnings. This was in line with Singh (2011). Singh termed the sector as a major source of growth in agriculture – based countries like India, in which according to him it is accounting for 32 percent of GDP growth. However, Sigh warned that the sector is no longer a major source of economic growth within the transforming and urbanized countries by contributing on average only 7 percent and 5 percent respectively.

3.6 Agricultural policies

To date there is no standard definition of the term policy. The Business dictionary defined it based on two terms relevant to our theme of discussion i.e. politics and management both of which are part and parcel of either government. Politically it refers to the basic principles by which a government is guided or the declared objectives that a government or party seeks to achieve and preserve in the interest of national community. From the management context it refers the set of basic principles and associated guidelines, formulated and enforced by the governing body of an organization, to direct and limit its actions in pursuit of long-term goals. From such definitions, it is therefore very clear that for effective outcomes from long term government goals within any country, there should be a relevant national policy with specific objectives through which many strategies (for agriculture in this discussion) like food security, farm mechanization, irrigation schemes, crop development, post-harvest management, marketing, value addition, export a, etc, can be implemented. However, (Fan, et al, 2011) yet, agriculture has suffered from many years of policy neglect.

Both countries of the case study have their agricultural policies in place although there seems to lack of specific policies to promote the sector. In India for example, according to Srivastava, et al (2009), there is no separate National Policy on Agricultural mechanization. Instead, agricultural mechanization strategy for the nation is covered under the National Agriculture Policy with different objectives viz. (i) to achieve sustainable increase in yields and cropping intensity so as to meet planned growth rate in Agriculture; (ii) to ensure a satisfactory rise in the incomes of agricultural workers; and thereby reduce urban & rural income disparity; (ii) to target flow of farm mechanization benefits to all types of farmers including small and marginal ones in different regions of the country, particularly rain fed areas; (iv) to create a worker friendly environment especially for women by reducing hard labor, health hazards and improve safety in production operations; (v) to reduce cost of production Governmental programmes related to agricultural mechanization lay emphasis on selective mechanization with the aim of optimal utilization of the available sources of farm power.

In Tanzania, the National Agricultural Policy (NAP) of 2013 is indeed a tool for facilitating the attainment of the national agricultural development. Unfortunately, except irrigation services that have officially been separated in 2014 by establishing the National Irrigation Commission under the National Irrigation Act No. 5 of 2013 as an independent department of the Government under the Ministry responsible for irrigation, most of the rest important aspects for the sector development (a few to mention: agricultural mechanization, agricultural lands, agricultural inputs, agricultural marketing, financing agriculture, agriculture insurance, etc) are covered under this policy instead of being put as separate specific national policies respectively. Further, a prospective language used within the policy relevant to the key issues implies that the government has not done appropriate efforts rather than being setting arrangements. Instead, a number of reforms such as KILIMO KWANZA Resolve, the Tanzania Food Security Investment Plan (TAFSIP), Southern Agriculture Growth Corridor of Tanzania (SAGCOT), Feed the Future Programme and Bread Basket Initiative, etc have been initiated for the so called to complement speedy implementation of ASDP being implemented differently at different periods. Others include MKUKUTA -the National Strategy for Growth and Reduction of Poverty (NSGRP), and now, Big Results Now (BRN).

The National Strategy for Growth and Reduction of Poverty (NSGRP)'s general objective aims at developing an efficient, competitive and profitable agricultural industry that contributes to the improvement of the livelihoods of Tanzanians and attainment of broad based economic growth and poverty alleviation complemented by ten specific objectives.

However, there are no comprehensible functions of apiece strategy for better outcomes to the country through agriculture sector. With reference to Ezekwesili et al, (2011) Tanzania has launched several well thought through strategic plans, notably TDV 2025, FYDP, and MKUKUTA II, but it is unclear what role each of them is to play within the national and sectoral planning processes**.** MKUKUTA II serves as the new MoF poverty reduction strategy, and the ministry's poverty eradication department is working out an implementation plan. At the same time, the President recently instructed the POPC to develop a 15-year strategic plan (and, within that, a five-year strategic plan) for his administration as a means to reach the goals set forth in Vision 2025. In addition, most sectoral ministries have developed their own medium-term strategic plans. It is important to bring order to this web of planning exercises.

3.7 Causes of low agricultural productivity

Several studies (Rajkumar 2008; Singh 2011; Mashindano et al. 2011; Salami et al 2010; Fan and Breisinger 2011; NABARD 2014a and URT 2008b) indicate that farm productivity within the case study counties and their respective regions is low as compared to other countries of the world together with respective reasons thereon. Although there have been a notable increase of per hectare yield in India, yet it is far below the international levels (Rajkumar, 2008). Different factors were mentioned as the major cause of such situation viz. (i) technological and institutional factors (Rajkumar, 2008) and they influence each other. Technological factors include lack of irrigation facilities, limited use of fertilizers, limited use of high yield variety of seeds, inadequate of protection schemes, lack of farm mechanization and flood and soil erosion while institutional factors embrace feudal land relations, small-sized holdings, rural indebtedness (also NABARD 2014a) and marketing difficulties. (ii) Global warming and climate change (Singh 2011) are the most serious long-term impedes facing world's agriculture. They pose a radical threat on grains' production.

India for example, Singh warned that will suffer a major retard in wheat production (which critically depends on cold night temperature) as global warming increases. (iii) Imbalanced resource allocation; Singh (2011) showed his concern of lack of equal consideration to favored and less favored subsectors, regions and household as the toughest policy dilemmas facing poor countries (e.g. Tanzania and India) with sever resource constraints. (iv) a combination of other factors leading to underutilization of agriculture for development as mentioned Singh include rapid population growth, declining farm size, falling soil fertility and missed opportunities for income diversification and migration that create distress as the powers of agriculture for development remain fallow and policies that excessively tax agriculture. In the words of Sigh, (2011) underuse of agriculture development is not confined to the agriculture-based countries but also in transforming countries with rapid growth in nonagricultural sectors, the reallocation of labor out of agriculture is typically lagging, leaving large number of poor people in rural areas and widening the rural-urban income gap. In Tanzania low productivity is one of the major constraints to rural development and agricultural growth. according to URT et al, (2012) a number of key factors affect agricultural productivity in Tanzania viz. (i) low public expenditure on agricultural Research and Development (R&D); (ii) inadequate and agricultural financing; (iii) poor production techniques; (iv) under-developed markets and market infrastructure and farm-level value addition; and (v) poor rural infrastructure, including rural roads, telecommunications and electricity etc. These factors are always associated with decline in the usage of improved inputs, including fertilizers, seeds, agro-chemicals and tractors, is associated with higher input prices against low output prices. Other factors for this poor performance include: absence of any alternative credit mechanism after the collapse of cooperatives; poor transport infrastructure (AgFiMS 2012); weak private sector response, weak farmer's organizations which are unable to access credits, markets and inputs on behalf of members; and inadequate competition and economies of scale (URT, 2008). Smallholder farmers and traders do not have readily acceptable collaterals to secure loans from formal financial institutions. Adequate and effective funds allocation by respective government is another important factor for achieving improved agricultural productivity and growth. Conversely, it seems to be the main obstacle in many developing countries including the case study by under investing in agriculture as it was insisted by Fan and Breisinger (2011). Thus, until recently, agriculture

has been characterized by underinvestment, both in terms of official development assistance (ODA) and public expenditures. Salami et al (2010) observed that smallholder farmers produce over 75 percent of agricultural output. However, that production is held back by low productivity and lack of market, credit, and technology access. They further pointed out poor technology as one of the major impedes of agricultural productivity within the developing countries. Thus, agricultural productivity gains have been based more on the expansion of cultivated land than technology adoption contrary to the developed world, where almost all agricultural growth is the result of yield increases. Salami et al (2010) concluded that most of the developing countries smallholders have faced several historical constraints, viz. (i) land tenure, access rights, and land management; (ii) credit access; (iii) access to input and output markets; (iv) infrastructure; (v) extension services; (vi) institutional problems; (vii) climate change and food security; and (viii) more recently the global financial, food, and fuel price crises. Viewed from agribusiness context, (AgFiM 2012) lack of access to the business, financial and agricultural information vital for commercial success is a major obstacle.

3.8 Fertilizer consumption

Different intellectuals (Soundari 2011; Desai 2012; Mandanna, Shashidhara and Mishra 2013; Mala 2013; Wanzala 2011; IFDC 2012; Jayne et al, 2003; Kamuhabwa 2014; Benson et al 2012 and Bumb and Baanante 1996) have demonstrated the importance of fertilizer in agriculture together with both the trend and current status of fertilizer consumption within the case study countries and their relevant regions respectively. According to the World Bank, Fertilizer consumption measures the quantity of plant nutrients used per unit of arable land. Fertilizer products cover nitrogenous, potash, and phosphate fertilizers (including ground rock phosphate) but excluding traditional nutrients - animal and plant manures.

Viewed individually, both of the case study countries have not done well on this aspect. During 2000 – 2002 (Desai 2012) the per hectare consumption of fertilizer in India was 90.12kg as compared to 1,285kg in New Zealand, 743kg in the Netherlands, 530kg in Belgium and 450kg in Japan. However, India is far leading compared to Tanzania. With reference to Mandanna and Shashidhara (2013), India is the third largest producer and second largest consumer of chemical fertilizer in the world. While Mala (2013) observed that there

has been a remarkable increase of consumption of total nutrients per hectare of gross cropped area, from 96.6 kg during 2004-05 to 108.5 kg during 2005-06 to 111.8 kg in 2006- 07 and 135.3 kg in 2009-10. The Indian Country report of 2013 by the Ministry of Statistics and Programme Implementation indicated that per hectare consumption of chemical fertilizers has increased from 89.63 kg in 2000-01 to 144.33 kg in 2011-12. Mandanna and Shashidhara (2013) narrate that during 2009-10 about 20.8 percent of 538 districts of the country consumed more than 200 kg of fertilizer per hectare. Nevertheless, the intensity of per hectare fertilizer consumption is more in northern (91.5 kg/ha) and southern (85.3 kg/ha, 112 kg/ha) region and lower in eastern (44.7 kg/ha) and western region (40.7 kg/ha). Further, according to Mandanna and Shashidhara, more than half of the total consumption of fertilizer is consumed by only two crops i.e. rice and wheat. Despite such increase Mandanna and Shashidhara (2013) warns that the total area under food grains is decreasing.

However, research shows that both Tanzania and the South – Saharan Africa region in general, have attained some positive upward trends in fertilizer use. With reference to Wanzala (2011), between 1990 and 2008, fertilizer consumption per hectare in Kenya increased from 21 to 33 kg/ha; Angola from 3.3 to 8.3 kg/ha; Cameroon from 3.7 to 8.6 kg/ha; Tanzania from 3 to 5.9 kg/ha; and Zambia increased consumption from 11 to 50 kg/ha. while, in terms of total fertilizer use, between 1998-99 and 2007-08, total fertilizer consumption in Malawi increased from 50,200 to 125,153 tons of nutrients (NPK); Nigeria, 163,200 to 497,697 tons; Uganda from 3,535 to 18,976 tons; and Zambia from 36,700 to 117,978 tons. Notwithstanding these commendable gains, the per hectare consumption of fertilizer has remained at the average of less than 10kg. Farmers are still lagging far behind other developing countries or areas in use of fertilizers. This was supported by (FAO 2004) that in Sub-Saharan Africa (SSA) per hectare consumption of fertilizer is even lower at an average of 10 kg/ha. IFDC (2012) in their report on fertilizer assessment in Tanzania reported that utilization of improved agricultural technologies has been slow to take hold in Tanzania and thus Tanzania's total fertilizer consumption was less than 9 kg of fertilizer nutrient per hectare of arable land in 2009-10. The report adds that only about 12 percent of farmers use mineral fertilizer. According to Jayne et al, (2003), Tanzania is among the countries whose fertilizer consumption per cultivated hectare has declined or stagnated (less

than 10 percentage) increase between 1980's and the 1996 to 2000 period. The average intensity of fertilizer use throughout SSA (roughly 8kg/ha) remains much lower than elsewhere (e.g. 54kg/ha in Latin America, 80kg/ha in South Asia, 87kg/ha in Southeast Asia, etc, warns Jayne et al. This is in consistency with Singh (2012) who reported that fertilizer consumption in Africa is the lowest in the world. While there has been a prominent increase in Southeast Asia and Latin America from around 50kg and 100kg in 1980's to 150kg and 200kg in the 1990's – increases of 300 and 200 percent respectively, to the contrary in Africa it has declined from 35kg/ha to around 26kg/ha due to increased prices of fertilizers and reduced access to credit for working capital. Lack of fertilizer manufacturing company within the country has made it a price taker. Benson et al (2012) insisted that Tanzania is a price taker for fertilizer from international markets, so it can do little about that element of the landed cost of fertilizer in the country; importation procedures and taxes, distribution and logistics as most of fertilizers are imported in bulk at Dar es Salaam port by private companies and poor infrastructure all of which contribute to rise of fertilizer prices that are not afforded by majority poor farmers. With reference to IFDC (2012), it is estimated that only about 10 percent of farmers use improved seed varieties and that only about 12 percent of farmers use mineral fertilizer. The IFDC (2012) further indicates that in 2010 Tanzania imported approximately 263,000 metric tons (mt) of fertilizer which according to them it was almost an half of the recommended quantity. They recommended that if the country were to enjoy a dynamic and diversified agricultural sector in 2015, the country had to import approximately 574,000 mt of fertilizer products, or just over double what it imported in 2010. In fact more fertilizers are being used in Tanzania as there are many private companies that are registered to import fertilizers. Unfortunately there has been no clear tracking (follow up) of these agrochemicals. This was supported by Kamuhabwa (2014) in the IFDC study on Consumption of Fertilizers and Fertilizer Use by Crop in Tanzania that there seems to be some variations of data on the amount of fertilizer manufactured, imported, exported and utilized. Thus three different sources are normally coming with a very big variation of fertilizer data in form of manufacturing, importation, exports and utilization by other stakeholders. This means the reported figures reflect only those that pass on the eyes of the government or a particular reporting sector or constituency. Kamuhabwa (2014) concludes that the differences of data from various stakeholders need to be addressed for the betterment

of the future planning and management of fertilizer data in Tanzania. A big attention is vital in order to come up with correct figures on fertilizer use by crop by each nutrient at regional and country level. This is contrary to India whereby according to Soundari (2011) an Integrated Fertilizer Management Information System (IFMIS) is in place and various IT based systems covering planning, movement, import, Handling-payments, project monitoring, performance monitoring and evaluation aspects to strengthen fertilizer information for decision support have been established.

3.9 Agriculture mechanization

According to Charles (2010) vast crop output can be realized through efficient agriculture mechanization strategies among many other factors. With reference to GOI (2013), availability of adequate farm power is very crucial for timely farm operations, increasing land and labor efficiency, increasing production and productivity and reducing crop produce losses. It also addresses the issues of scarcity of farm labor during peak agricultural seasons like sowing and harvesting. This makes it clearly that for a country to achieve agriculture commercialization then farm mechanization is inevitable. With reference to FAO, a broad concept of machinery and equipment is used for the agricultural census, covering all machinery, equipment and implements used as inputs to agricultural production including everything from simple hand tools, such as a hoe, to complex machinery such as a combine harvester. Singh (2006) insisted that to ensure timeliness of various operations, it is quite inevitable to use such mechanical equipments which have higher output capacity and cut down the number of operations to be performed. Agriculture mechanization (FAO 2007) enhances human capacity, leading to intensification and increased productivity resulting from timely planting, weed control, harvesting, post –harvesting handling and accessibility to markets. Singh (2014) insisted that the use of farm mechanization enlarges the employment opportunities both on farms and in nonfarm sectors through increase in area under plough, multiple cropping, development of agro-industries and related services. It has a potential of turning idle land into productive one. In the words of Kulakarni (2013) farm mechanization imparts capacity to the farmers to carry out farm operations, with ease and freedom from drudgery, making the farming agreeable vocation for educated youth as well while helping

farmers to achieve timeliness and precisely meter and apply costly input for better efficacy and efficiency.

Unfortunately, agriculture mechanization in most of developing countries, including the United Republic of Tanzania, has not received a reputable attention by their respective governments. This has made agricultural productivity within those areas to largely remain static. FAO (2010) in the co organized round table meeting of experts on investment in agricultural mechanization in Africa warns that despite this domination, investment in the sector is still low in most African countries. Charles (2010) observed ninety percentage of farming in Tanzania to have been conducted by small-holder farmers using hand held hoes, animal traction and ox-ploughs. This was supported by Lyimo (2011) in his presentation on Agricultural Mechanization in Tanzania to the workshop on "Boosting agricultural mechanization in rice-based systems in Sub-Saharan Africa" - Saint Louis, Senegal where he reported that the level of mechanization in Tanzania is low with the hand hoe dominating in the farming systems. According to Lyimo as by the year 2011, the use of animal traction and mechanical power was estimated at 24 and 13 percent respectively. FAO (2010) reports that sub-Saharan Africa is still facing both an acute lack of human resources available for agricultural production and a very minimal number of tractors available as an alternative source of power. FAO (2007) in its report titled Addressing Challenges Facing Agricultural mechanization inputs supply and farm product processing' reported that human muscles has remained the main source of power in SSA cultivating about 65 percent of the total arable land, while drought animals and tractors held 25 and 10 percent respectively contrary to Asia whereby the shares of the three means of land cultivation – human muscles, drought animals and tractors stood at the ratio of 3:3:4 respectively.

As a contrast, according to FAO (2010) low agricultural mechanization in Africa, yields of food grains and other staple cereals have typically remained at about 1 tone per hectare, which is about one-third of the average achieved in Asia and Latin America. The only factor mentioned for such success in Asia and Latin America was farm mechanization. According to FAO (2010), the number of tractors per 1,000 ha of arable land in 1980 was 2; by 2003 this had sunk to 1.3 respectively. Whereas, in Asia and the Pacific region there were 7.8

tractors per 1,000 ha, and this had risen to 14.9 during the same period. Among the major reasons mentioned here are unaffordable high prices of agricultural machinery, (Lyimo 2011); poor management and supervision, weak infrastructure and the general poor performance of the economy (FAO 2007).

The situation is different in India; according to Singh (2014), the county has become self-sufficient and a net exporter of food grains just because of evolution of high yielding crop varieties, increased use of chemical fertilizers, development of irrigation facilities and plant protection measures accompanied by effective price support programmes of farm products. According to Kulakarni (2013), the agricultural engineering inputs in India have played substantial role in increasing production and productivity through appropriate mechanization inputs for production and post production agriculture. Kulakarni adds that at present in India, tractors are being used for tillage of 22.78 per cent of total area and sowing 21.30 percent of total area. Thus to promote farm mechanization within the country farmers have also been provided financial assistance for owning a wide range of agricultural equipments viz. tractors, power tillers, bullock/tractor drawn implements, reapers, threshers, irrigation equipment, hand tools, etc; whereas new equipment such as precision planter, zero-till drill, seed cum fertilizer drill, raised bed planter, improved weeders, plant protection equipment, harvesting and threshing machines, drip, micro sprinkler and sprinkler irrigation equipment have been made available to the farmers. Heavy investment in the tractor industry is another factor that has contributed on success of farm mechanization within the country. In the words of Srivastava et al (2009), Indian Tractor Industry is the largest in the world, accounting for one- third of the total global production. With reference to the Ministry of agriculture of India in their report titled State of Indian Agriculture 2012-2013, the tractor density in India was about 16 tractors for 1,000 hectares, as compared to the world average of 19 tractors and that in USA of 27 tractors per one thousand hectare of cropped area. According to the estimates of the Indian Tractor Manufacturer's Association, the industry was expected to stabilize at about 350,000 tractors per year and an additional 60,000 tractor for exports by 2010 added Srivastava et al (2009).

3.10 Land survey, acquisition, ownership, use and management

Land is the key asset for the rural and urban poor that provides an important foundation for the economic and social development (FAO, 2003). According to (Mearns 1999), it plays a dual role in rural population: apart from its value as a productive factor, land ownership confers collateral in credit markets, security in the event of natural hazards or life contingencies, and social status. In the words of Rawal (2008), in an agrarian society without land no agricultural production can take place. Right to use and ownership of land is one of the most important factors in the quest of better agricultural production. Both of the case study countries have respective legislations relevant to land ownership and management. In India land issues are guided by The Land Acquisition Act, 1894 while in Tanzania management and promotion of land ownership are guided by the National Land Policy of 1997 that has then been translated into two laws; the Land Act of 1999 and the Village Land Act 1999. However, both are still facing the problem of access and ownership of land to smallholder farmers.

Agricultural production in Tanzania is characterized primarily by small-scale subsistence farming (IFDC, 2012 and WB, 2011). Studies done by Lyimo 2011, IFDC 2012 and Kayandabila 2013 observed that smallholder farmers cultivate between 0.2 and 2.0 ha. According to IFDC (2012) approximately 85 percent of the arable land is used by smallholders cultivating between 0.2 ha and 2.0 ha while the average per capita land holding was estimated to be only 0.12 ha. Kayandabila, (2013) emphasized that there are 1,006 large scale farms in Tanzania with the average size of 1,107 ha. The World Bank, (2011) in the Tanzania: Country Brief reported the dominance of subsistence and smallholder farmers to the sector cultivating an average farm size of between 0.9 hectares and 3.0 hectares compared to a small number of commercial farmers in the country implying that rural poverty remains pervasive. Both access to- and ownership of land are among the major constraints of the sector growth. With reference to AgFiMS (2012), about 12.4 percent respondents in the AgFiMS market segment indicated that limitations in terms of land access prohibited the growth potential of their businesses while food crop producers used on average 10 acres of land for their business activities, cash crop producers 10.6 acres, and livestock producers 10.2 acres. However, most claimed land ownership, as they did not have title deeds to it, the

situation that would significantly affect their access to, or eligibility for, secured lending facilities. Several studies have observed numerous challenges facing land ownership in rural Tanzania viz. (i) farmers – livestock keepers conflicts on land use; (ii) land disputes resulting from rapid expansion of towns encroaching on surrounding farming areas (Mugambi 2013); (iii) tenure conflicts between customary and granted land rights (Simbarashe, 2012); (iv) alienation of the people through accumulation of land in the hands of big national and multinational companies, leaving small-scale producers landless (Chachage, 2010); (v) inadequacy of relevant information; (vi) land insecurity amongst small land holder farmers, mainly women (Mugambi 2013); and (vii) Concentration of powers in the Ministry based on s.14 of the Act (Sundet, 2004).

In India also, despite of agriculture production being characterized by smallholder farmers particularly rural population, land ownership has remained a tough nut to crack. According to Bakshi (2010), the percentage of households that did not own any land other than homesteads as a proportion of all households, by social group, rural India, in 2003 stood at 41.6 percent. Rawal, (2008) reported that as by the year 2003-04 the proportion of landless households stood at 31.12 percent leaving a substantial share of land being in the hands of large landowners having more than 5 ha. But today, (Damodaran 2015), about 56 percent rural households do not own any agricultural land and about 70 percent (NSSO 2014) of the agricultural households who possessed less than 0.01 hectare land, possessed only homestead land. This according to WB (2007) left large amounts of land continue to be held by government with limited impact of land rental markets regulation on poor peoples' ability to access land or use it productively. Women discrimination on access to and ownership of land is another complexity problem facing both countries; With reference to FAO (2010), while 19.7 percent of agricultural holdings are headed by women in Tanzania, only 10.9 percent was reported in India. According to the Zeenews (2013), one of the great problems faced by women farmers in India is that of access to patta or title to land. Achanta (2013) mentioned dearth of ownership of immovable assets mainly land as one among crucial factors contributing to the poor economic status of rural women in India. According to Achanta, women rarely own fertile land and, even if they do, they face numerous problems in securing relevant titles. Several factors were mentioned by the World Bank (2007) as the barriers of

access to and ownership of land to smallholder farmers in India viz**.** (i) lack of land rights; (ii) informality; (iii) High Non-agricultural land prices; (iv) high costs of land transferring; (v) pervasive corruption in land administration; (vi) land-related conflicts; and (vii) duplicate and redundant processes, a combination that has led numerous households in marginal areas remain landless or without any rights to land that they have owned for very long periods of time driving them into informal arrangements.

3.11 Agriculture insurance

Different studies (Mogues et al. 2012; Hazell et al. 1986; Mrindoko 2012; etc) have indicated how the industry faces numerous of uncertainties particularly in rural and marginalized areas. Agriculture is the riskiest endeavor among the major economic activities, especially in developing countries, due to high and difficult-to-predict weather fluctuations, great vacillation in prices driven by global market conditions, and the occurrence of often sudden and dramatic natural shocks such as those caused by plant and animal diseases and pests Mogues et al (2012). This is in line with Mrindoko (2012) who reported that farming in developing countries is exposed to a variety of income uncertainties ranging from fluctuation of prices and unpredictable weather patterns, thus holding back efforts to lift people out of poverty. Hazell et al. (1986) have classified agricultural production as a typically risky business whereby farmers face a variety of price, yield, and resource risks, which make their incomes unstable from year to year.

Numerous of studies (SFSA 2014; Rajkumar 2008; Mogues et al. 2012; Hazell et al. 1986; World Vision Tanzania 2012; Akyoo et al. 2013; etc) have spotted out the importance of agricultural insurance. SFSA (2014) warned that the success of agricultural production does not only depend on a farmers' agricultural knowhow, but also on the climatic and environmental conditions, which are generally beyond the grower's control. This is where the development of agricultural insurance becomes important. Agriculture insurance aims to support the development of modern agriculture to all sizes of agricultural holdings. It has a clear and definite role to play in the development of the rural economy, which in turn strengthens the national economy (Rajkumar 2008). With reference to Hougaard et al (2012), Tanzania is encompassed largely by poor and rural population relying on subsistence

agriculture in areas with underdeveloped infrastructure the situation that necessitates availability of insurance to protect the poor against risks. In the words of World Vision Tanzania (2012), agriculture insurance improves productivity, which ends up boosting the living standards of communities, and reduces the food security challenges associated with climate change. To achieve this we need government intervention through financial means for availing excess reinsurance covers to dealers. Thus, effective agriculture insurance should begin at seed sowing stage up to marketing of the final agricultural produce by covering the all capital instruments – tractors, threshing machines, drought animals, pump sets, harvesting machines, storage and warehousing, processing plants, etc to promote production of the desired produces for both food and commercial purposes. Not only that but also, availability of relevant information is very important. Mogues et al. (2012) termed the information problems as one of the major reasons for the absence or thinness of agricultural insurance markets. They warn that it is difficult for an insurer concerned with profitability to set different premium prices for those farmers who are more susceptible to risks than for those who are less exposed to negative shocks. Rajkumar, (2008) warns that insurance should not be seen as or promoted as a solitary effort but a component of services that need to be extended to agriculture sector.

3.12 General Agriculture insurance situation within the case study countries

According to Karkera (2010), insurance in India began in 1870's when the first policy was issued by "The European & The Albert'. The first Indian Insurance Company was Bombay Mutual Assurance Society Ltd formed in the year 1870. According to the GIC, the general insurance business in India was nationalized after incorporation of the General Insurance Corporation of India (GIC) on 22 November 1972 under the Business (Nationalisation) Act, 1972 (GIBNA) in pursuance of Section 9(1) of GIBNA for the purpose of superintending, controlling and carrying on the business of general insurance throughout the country. In the year 1974-75 two agricultural policies among many others (i.e. cattle insurance and Agricultural Pump Set Insurance) were introduced. To insure farmers against natural calamities, the Government of India from time to time has been introducing different crop schemes throughout the country viz. National Agricultural Insurance Scheme (NAIS) / Rashtriya Krishi Bima Yojana (RKBY); Varsha Bima / Rainfall Insurance; Rainfall

Insurance Scheme for Coffee Growers (RISC); WBCIS - Weather Based Crop Insurance Scheme; Rabi.

According to Akyoo et al (2013) the quest for crop insurance in Tanzania traces its relatively long history back to 1986 when the first feasibility study was conducted by the National Insurance Corporation (NIC). To date (SFSA 2014) there is a remarkable growth of 13 percent of insurance usage in Tanzania. However, the general usage of insurance in the country is still as low as less than 40 percent because of different reasons viz. affordability, unawareness, difficultness in setting premium prices for different farmers, etc. In the words of SFSA (2014), 60 percent of the uninsured population cannot afford it, 24 percent do not know how insurance works, 18 percent do not know how to find out where to buy it, and 14 percent do not know what insurance means. Despite of several studies (Hazell et al. 1986; SFSA 2014; World Vision Tanzania 2012; Akyoo et al 2013; Hougaard et al, 2012; etc) to spot out the importance agriculture insurance due to a number of threats facing agriculture within the country till to date there is no specific agricultural insurance within the country.

3.13 Irrigation farming

Effective crop output can be realized through planned irrigation among many other factors (Charles 2010). This type of farming is more effective and environmental friendly by saving water a scarce natural resource, fundamental to life, livelihood, food security and sustainable development. According to Kulakarni (2013), the shift from conventional flood irrigation to sprinkler, micro sprinkler or drip irrigation systems is apparently visible indicating the importance of water use efficiency for covering more area under irrigation. This means when fully equipped, one using this farming system is assured of cultivating throughout the year depending on the strength of water sources. The only disadvantage of this system is high initial costs for constructing infrastructures (or wells) and acquiring other equipment pumps, pipelines, valves and pressure regulators. Nevertheless, the facilities provided by the government are insufficient. According to GoI (2014) only 40 per cent of farmers confirmed availability of irrigation facilities for their entire farming land. About 45 per cent of the farmers said their main source of irrigation were private pumps, bore wells/boring and tube well while 38 per cent of the farmers confirmed to have access to canals in their villages for

irrigation. Traditional sources of irrigation like pond and well continue to be important. About 34 per cent of the farmers depend on wells while 30 per cent of the farmers said they depend on the pond to irrigate their land. Only 18 per cent of farmers said that they have the facility of Government tube wells for irrigation.

Inadequate water for irrigation has remained the major obstacle for several farmers. According to AgFiMS (2012) a key constraint for producers in Tanzania was access to water. The lack of access to irrigation systems meant that agricultural production had to be timed to the seasons. Year-round production was therefore not possible for most produce. According to AgFiMS (2012): (i) more than 26 percent of producers in the AgFiMS market segment did not have access to an adequate amount of water to address business needs; caused by lack of access to irrigation systems and having no alternative but to rely on nature (i.e. rain water collection, rivers, dams, and springs) for water provision. This means they therefore had no control over the amount of water availability at a given time for the purpose of the business farming; (ii) about 81 percent of producers had no access to any form of irrigation; (iii) while 10.9 percent of producers had access to their own irrigation systems; and, (iv) only 8.1 percent of producers had access to communal schemes.

3.14 Postharvest losses management

Post harvest losses (PHL) plays a major part of loss of both farm produce and income loss in different approaches viz. during harvesting; transportation; drying; threshing (cleaning); processing; storage and/or marketing of the produce (Lwechungura 2017). It is estimated that almost one – third of the agricultural production is wasted and does not reach the final consumer. According to Rembold et al (2011) grain postharvest losses may be both the physical losses (weight and quality) suffered during postharvest handling operations and also the loss of opportunity as a result of producers being unable to access markets or only lower value markets due to, for example, sub-standard quality grain or inadequate market information. Singh (2011) observed that postharvest handling accounts for 20 to 40 percentages of the losses at different stages like grading, packing, storage, transportation and marketing of both fresh and processed products. With reference to Trachtenberg (2014), around 30 to 50 percent (or 1.2 – 2 billion tones) of all food produced in the world is lost

before being consumed. This then results into lower farm income, higher food prices and inadequate quantity of food. In Africa postharvest losses have remained a persevere hitch. Trachtenberg (2014) observed that post harvest losses in Africa are as high – as about 20 percent of grain and 30 – 50 percent of horticulture. Bertram et al, (2013) reported that in south East of Asia physical post harvest losses range from 15 – 25 percent while quality losses (loss in value) range from 10 – 30 percent. The 2011 World Bank report noted that food grain losses particularly maize losses in the East Africa Region was ranging from 20 - 25 percent. Kitinoja (2014) noticed enormous global food wastes trough post harvest losses averaging from 30 to 50 percent.

In Tanzania the situation is even more than worse; postharvest losses are still high, due to poor historical on emphasize of food safety. Specific agricultural produce facilities (storages, pre cooling, processing and markets) are missing in many regions while those existing are incomplete, lacking basic infrastructure. This has been forcing farmers to sell their produce fresh and unprocessed as it was noted by Trachtenberg (2014) that 90 percent of Tanzanian farm produce (fruits and vegetables) were sold fresh, while green beans were sold on the road sides instead of supermarkets and or normal markets. Viewed from the SSA regional countries, (Mecozzi 2012) PHL ranges from 30 to 80 percent of horticultural crops due to lack of awareness about good harvesting and packaging practice and lack of storage facilities. Although Mrema and Rolle (2002) spotted only tomato and onion as major crops affected by horticultural post harvest chain, today some individual elements of horticultural produce face high rates of postharvest losses in Tanzania. For example while postharvest losses of mango in Tanzania have been estimated at 60 percent in 2008 (Kimaro, and Msogoya 2012), comparable lower losses (25 – 40 percent) were reported in India by (Iqbal 2008). According to URT, (2008) in other cases, substantial post-harvest losses have been incurred by farmers which, in turn, have tended to intensify rural poverty and unemployment levels. This was supported by Singh (2011) who reported that the average waste of cereals in Africa is estimated between 10 to 15 percent. However, in some cases losses of total grains is sometimes higher than 30 percent because of poor storage technology and facilities hence high rates of losses in Africa as compared to other regions of the world.

The same situation applies to India. According to Dev, (2012) reported that among several weaknesses revealed by the Indian Council of Agricultural Resarch (ICAR) during a review of the research and development activities during the first two years of the 10th Plan inadequate priority to emerging challenges, were post-harvest, marketing and environmental conservation. Reddy (2012), noted that by the year 2012 only one fourth of the existing markets had common drying yards and godowns whereas cold storage facilities existed only in 9 percent of the market and perishable goods are brought for sale. Singh (2011) revealed a perceptible loss in the amount of fruits and vegetables produced due to lack of proper postharvest operations that in turn leads to a wide gap between the gross production and availability. Weak processing infrastructure was mentioned among contributing factors for such huge postharvest losses in the country. According to Reddy, (2012), post harvest losses in India are about 20 to 30 percent in different crops due to inadequate infrastructure development for postharvest management such as pre cooling. With reference to Singh (2011) horticulture was contributing 28 percent of the agricultural GDP in India, but only 2 percent of the produce is processed, 0.4 percent is exported while 22 percent is lost or wasted in the market chain.

Since most of the agricultural produce are seasonal there should be streamlined programs for storing them during the harvesting season for future release when demand goes up. This will act as one of the price stabilization factor for agricultural produce and sector growth as a whole. Reddy (2012) noticed that whenever warehousing facilities are available, farmers are in a better position to store their produce, and, by producing the warehousing receipts as a security, they are able to get financial loans from commercial banks, etc. however Reddy warns that not all farm producers are having access to those godowns.

3.15 Agricultural marketing

The role of the agriculture market is to deliver agricultural produce from the farmer to the consumer in the most efficient way (GOI 2012a). According to Singh (2011) both agricultural marketing and rural development are key elements for poverty alleviation particularly for rural population whose livelihood depends on agriculture – especially within

the developing countries where it is reported by different studies that more than 75 percent of their population live in rural areas.

With reference to Mogues et al (2012), in most low-income countries in Asia and Africa, most agricultural production comes from smallholder farmers. Even in Latin America, where large plantations are more prevalent, market power concentration in primary agricultural production is not a key impediment to efficiency, because given the core features of the sector, such as spatial dispersion, primary agriculture does not lend itself as easily to such concentration as manufacturing or service sectors do.

However, (NABARD 2014b), market has remained one of the major constraints which the poor face in their quest for livelihoods with several middlemen who form cartels to exploit the producers. According to GOI (2013), there is general opaqueness and poor price transmission mechanism the situation that has created a persisting wide gap between the prices received by the farmers and the prices paid by the consumer. Thus, while the farmers are not able to receive a price to cover their costs of production, the consumers are paying an abnormally high price for the same commodity.

Reddy (2012) observed that marketing costs in India are incurred by several middle men who undertake different marketing activities with profit motives. This has posed a negative impact to both the farmers who are forced by the situation to sell their raw produce to middlemen at non remunerative prices, and, the consumers who are charged high prices for final products. Reddy added that in case of agricultural products, it so happens that there is a much difference between the price received by the producers per unit of a product and that paid by the consumer for that unit of product.

Marketing information play a great role to both the producer and the consumers on one side and the government as a key player for price policy making on the other side. For the effective marketing decision making, appropriate and adequate marketing information is required. Thus timely and relevant and correct information should be in place for better marketing decision making. On the basis of adequate marketing information, a right decision

can be taken regarding what to produce, how much to produce, where to sell and how much to sell, etc, (Reddy 2012).

Singh (2011) insisted the potentiality of good market information system to persuade more transparency and competition in markets by providing information to both public and private stakeholders of which in turn can be used to predict future shortages. Thus, the producer, consumer and the policy maker together need relevant opinions, estimates and facts in connection to marketing process. Marketing information can be obtained from different sources ranging from individuals to public viz. word of mouth news, telephone, notice boards, newsletters, newspapers, journals, radios and TV broadcasting, government reports and publications.

Marketing institutional infrastructure created and promoted by the government is an essential feature in the process of agricultural produce marketing. They help to promote and process marketing functions on behalf of the farmers or members. According to Singh (2011), marketing cooperative in India is a four-tier structure consisting of primary marketing societies, district or regional cooperatives, state marketing federations and national level marketing cooperative. The main marketing cooperative include National Agricultural Cooperative Marketing Federation (NAFED), tribal Cooperative Marketing Federation (TFIFED), state Cooperative Marketing Federations, district level cooperatives or unions of cooperative and primary agricultural cooperative marketing societies. With reference to Rajkumar (2008), by the end of March 2006, India had 7,566 regulated and 21,780 rural primary/periodic agricultural markets with an average of 21 villages for one rural market. In the words of Singh (2011), the country has 2,354 main market yards, 4,807 sub-market yards and 27, 294 rural periodic markets that are managed by either Agricultural Produce Market Committees that represent farmers and other stakeholders, local self- government institutions or government departments. However, Singh further noticed that about 85 percent of the available rural periodic markets places are inefficient due to lack of respective facilities. Thus nearly 80 percent of the marketed surplus of agricultural products is handled by the private sector. The India 2009, the reference Manual reported that the Ministry of Agriculture

formulated a model law on agricultural marketing for guidance and adoption by State Governments.

In Tanzania the producers are not guaranteed of markets of their crops in all localities due to, among other reasons, (URT 2008a) the weaknesses of cooperative societies; lack of farmers associations, inadequate number of competing buyers and absence of regulatory institutions to oversee the quality and standard for non-traditional exports and food crops. Consequently, producers have not received remunerative prices and at times they have remained with unsold produce in cases where buyers do not turn up or offer low prices.

Both governments of the case study countries have proved failure on agricultural produce marketing and price management. In India according to GOI (2014), food and agricultural commodity prices are primarily determined by domestic demand and supply factors. Market micro infrastructure, the systems and procedures of commodities trading and players determine the market efficiency. It has been observed that there is wide spread imperfection in the agricultural produce markets. In that report the government confesses that there is general opaqueness and poor price transmission mechanism. Consequently, there is a wide gap between the prices received by the farmers and the prices paid by the consumer. At times, the farmers are not able to receive a price to cover his cost of production while the consumers are paying an abnormally high price for the same commodity. Similarly, in Tanzania according to URT, (2008a), the depressed prices for primary commodities in global markets and constraints to access local markets are among of the challenges to the government in promoting the marketing of agricultural produce. The government confesses that despite a number of policies including the Agriculture and Livestock Policy (ALP), 1997; Cooperative Development Policy (CDP), 2002; Rural Development Policy (RDP); National Trade Policy 2003; National Livestock Policy, 2006; Agricultural Sector Development Strategy (ASDS) 2001; and, Agricultural Sector Development Programme (ASDP), 2005, issues of agricultural marketing issue which is influenced by liberalization and globalization forces has not been addressed adequately.

In Tanzania, among many challenges stated by the government to have been facing agricultural marketing (URT, 2008a), include (i) weak legal and regulatory framework on agricultural marketing; (ii) weak institutional set-up dealing with agricultural marketing; (iii) underdeveloped and improperly managed agricultural marketing infrastructure; (iv) inadequate marketing research and intelligence which inhibits timely availability of data and information necessary for decision making. However, all these are termed as primary responsibility of the same government. The question now comes to whom is government complaining to?

Agricultural marketing principally is associated with several challenges no matter how is the respective government involving itself to address it. According to Mogues et al (2012) market failures are pervasive in developing countries including the case study countries. In India according to GOI, (2014), the most prominent are limited access to relevant information, licensing barriers, lack of marketing infrastructure, high incidence of market charges, high wastage in supply chain, lack of national integrated market, large number of marketing channels with long supply chain, etc. Consequently, (GOI 2013) many the smallholders sell their produce immediately after harvest, invariably realizing lower prices and later buy the commodities during the lean season at much higher prices.

In Tanzania instead of helping them, the government itself sounds like a cause some agricultural problems facing their farmers. According to AgFiMS (2012) farmers specifically in rural areas are faced with a major challenge of limited permits to sell their products in areas where there are markets but outside of the area they operated from due to government bans. Other constraints and challenges that must be addressed (URT, 2008a) include (i) Inadequate value addition in agricultural produce; (ii) Inadequate adherence to grades, standards and quality in agricultural products marketing; (iii) Weak legal and regulatory framework on agricultural marketing; (iv) Weak institutional set-up dealing with agricultural marketing; (v) Underdeveloped and improperly managed agricultural marketing infrastructure; (vi) Inadequate marketing research and intelligence which inhibits timely availability of data and information necessary for decision making; (vii) Limited use of marketing risk management approaches; (viii) Inadequate access to financial services for

agricultural marketing activities; (ix) Inadequate marketing linkage; (x) Inadequate capacities to utilize opportunities emerging in the domestic, regional and international markets, including preferential markets; and, (xi) Environmental degradation, gender imbalances and costs caused by diseases, HIV and AIDS. AgFiMS (2012) observed that apart from more than one – third (35 percent) of the processors in market segment to face challenges in getting their products to market, both producers and processors faced challenges on distance to market and unreliable transportation of products and the cost thereof and loss of stock whilst in transit irrespective of whether they operated from urban or rural areas.

3.16 Agricultural Banking and Credits

Financial support be it government grants or credits assumes a major importance to all sectors for effective development in either country. Research indicates credits requirements are more pressing in rural population particularly agricultural producers and tenants cultivators most of whom do not earn sufficient funds to meet even the minimum requirement of their life. According to Reddy (2012), in India, more than any other sector, agricultural sector needs credit support as it sustains more than two third of the population and accounts for 19 percent of the country GDP.

Several studies indicate that agriculture credits vary from consumption to production purposes depending on the nature and size of the farming community involved. Consumption credit is for indigenous and small farming community who undergo subsistence farming but yet they do not manage to produce such enough quantity of different food items. Production credit is for daily production activities. According to Reddy (2012) production credit is categorized into three main forms from short to long term depending on the period of being repaid. Short term credits are mainly for purchasing agricultural consumable requirements viz. seeds, wages, fertilizers and pesticides usually repaid after harvest of crops; medium term credit are for purchase of farm tools and implement livestock and well digging repayable within 12 months while long term credits aim for long lasting agricultural related equipments like machinery and additional of land – repayable from a ten to fifteen years.

3.16.1 Rural indebtedness

A considerable portion of rural population in most of the developing countries including the case study depends on agriculture as the main source of their livelihood. Unfortunately, what they get from faming has been not as much as expected to even suffice for their food and other requirements of their lives. The situation has automatically been compelling them to borrow for both productive and consumption purposes from private sources under certain but unfavorable terms and conditions to their side. As a result, the debt burden keeps enlarging as time goes. According to Reddy (2012) it is normal for rural people to search for a new source of borrowing to settle the outstanding loans hence rural indebtedness.

Several factors were mentioned by Reddy (2012) as the major causes of rural indebtedness viz. (i) inherited debt – many agriculturalists start their lives with ancestral debt and sometimes it drags on their whole lifetime; (ii) subdivision and fragmentation of holdings whereby land is divided into small pieces from time to time leading into uneconomical cultivation; (iii) vagaries of climatic conditions – failure of crops due to either floods, drought or any other unforeseen events have made agricultural production uncertain forcing farmers to borrow from money lenders who exploit them; (iv) ignorance and illiteracy – the situation that give rooms to money lenders to tempt them to borrow, lawyers to quarrel and traders to waste; (v) inability to provide for deficiency; (vi) low income of cultivator – caused by the twin evils - poverty and lack of capital both of which force them to borrow; (vii) high rate of interest ranging from 10 to 30 percent set by village money lenders have always been perpetuating the farmers indebtedness; (viii) extravagant and improvident borrowing caused by wasteful expenses on social ceremonies like marriages; (ix) litigation that drags on for long time leading into unproductive expenditure; (x) distress sales – selling farm produce at very low prices but buying them at very high prices; and, (xi) high medical expenses – rural poor are forced to borrow heavy amounts. With reference to NABARD (2014a) the 59th NSS round, revealed that only 48.6 per cent of 89.35million farm were reported to be indebted leaving 51.4 per cent or about 46 million not able to enjoy any indebtedness (of the value above ₹300) from any of the credit agencies both local and international.

3.16.2 Involvement of commercial banks to finance the sector

In India, agricultural finance by commercial banks began in 1955 by the nationalization of the imperial Bank of India to become State Bank of India (SBI). The bank has a special department for promoting agricultural growth called Agricultural Development Branch all over the country. According to Reddy (2012), in 1977 SBI launched an integrated rural development program on a pilot basis aiming to meet both requirements for agriculture and allied activities and rural industries, rural housing, rural health and other villagers' needs. For agriculture, among many other facilities, the bank provides advances against the warehouses receipts that help farmers to wait for better prices for their produce in the market.

It is well known that the main objective of commercial banks is profit making. Therefore to avoid a burden to farmers seeking agricultural credits and loans we need existence of a keen supervision of the government under clear regulations and encouragement to the banks to follow the principle of growth with profit rather than profit making. Referring to Reddy (2012), by April 1980, about 20 banks in India were nationalized with a view of giving purposeful direction to the resources owned by them. And to date, it can be said that banking industry in India is almost in the public sector with agricultural financing total under the eyes of the government.

The situation is different in Tanzania whereby the banking industry is in the hands of private sector. Apart from many local and foreign commercial banks that have recently mushroomed within the country, by 2005 there were only three former and popular banks viz. National bank of Commerce (NBC), National Microfinance Bank (NMB) and CRDB Bank that were owned by the government. But today they are all privatized either partially or wholly.

CRDB Bank was formed in 1996 when the former Cooperative Rural Development Bank that was wholly owned by the government was privatized, capitalized and restructured. The bank provides commercial banking services to industrials, small to medium size corporate clients and large corporations including the government. The government per se has no share to this bank.

NMB is the commercial bank formed in 1997 after the break-up of the old National Bank of Commerce in the same year, by the act of parliament. Initially it was offering only savings accounts with limited lending capabilities. In 2005 that bank was privatized and today the then sole owner of the bank, government of Tanzania owns only 30 percent of divesture. The bank provides commercial banking services to the government, individuals and private corporations.

The National Bank of Commerce (Tanzania) Limited originates the history of 1967 when the government of Tanzania nationalized the financial institutions including banks. In 1997 NBC was split into three different entities viz. (i) NBC holding Corporation; (ii) NMB and (iii) NBC (1997) Ltd. Three years later the bank (NBC) was privatized and the name became NBC Ltd where currently the government owns 30 percent.

Tanzania Investment Bank (TIB) is the only financial institution solely owned by the government of Tanzania to date. The bank was established in 1970 by the act of parliament aiming to provide medium and long-term loans to investors in commercial agriculture, manufacturing, processing, construction, transport, tourism and mining sector. However, such objectives were not met to date as the bank could not take off as planned due to the called economic adversity. As of September 2014, the bank had only six branches within six regions Dar es Salaam, Mwanza, Arusha, Dodoma, Mbeya and Zanzibar out of thirty regions of the country.

3.17 Infrastructure and Agriculture Development

The Oxford Dictionary defines infrastructure as the basic systems and services that are necessary for a country or an organization to run smoothly, for example buildings, transport and water and power supplies. Generally it means the set of interconnected structural element which provides a framework supporting an entire structure of development such as roads, telecommunications, bridges, water supply, sewers, electrical grids, etc,. It is an important term for judging a county or region's development. Viewed functionally, it facilitates production of goods and services and distribution of finished goods to the markets as well as basic social services such as schools and hospitals.

With reference to the World Bank, infrastructure helps to determine the success of manufacturing and agricultural activities. Information and communication technologies as part of infrastructure promote growth and improve social services – health, education and cultural advances delivery. With proper infrastructure - roads, electricity and telecommunication, the urban-rural flow of goods and services becomes more easy and reliable resulting into limited market apportionment. From agriculture development point of view, we need an integration of several factors viz. water and electricity supply, roads, health facilities, education, marketing services and telecommunication for a strong growth and development of the sector. According to Chilonda et al (2009) investments in core public goods - science, infrastructure, and human capital - combined with better policies and institutions are major drivers of agricultural productivity growth. Desai, (2012) found that village approach roads assume the primary importance for dynamic socio-economic superstructure. Dev, (2012) termed investment in rural infrastructure as an important aspect for agricultural growth than trade modernization per se because it plays an important role in both input and output sides by ensuring timely and adequate delivery of inputs to the farmers, and, on the output face helps to integrate local markets with national and international markets.

3.17.1 Access to roads and electricity

Roads and electricity together with education are the catalytic agents of development particularly on the agriculture sector. They both have a great interactive effect on the growth and development of agriculture, ameliorating the living conditions in the village through quick access to social services, transportation, marketing and processing of farm produce. According to Desai (2012) roads, electricity and education forms a major portion of rural infrastructure. They together enhance the mobility of the rural population and lend dynamism to their outlook. This brings about a direct impact on agriculture growth and rural development by improving and enhancing human capita, social, cultural and economic environment both at farm level and the rural households. Education is the key element of development at any sector of the country as it facilitates the rural – urban cultural interactions and improves the human capital in the villages.

Viewed at the individual perspective, access to roads and electricity within the case study countries differ widely; in Tanzania access to such vital resources is at a very low rate. Most of the villages still lack such catalyst. Only 17 percent of the country population (i.e. cities and towns) have access to electricity whereas most of the roads are rough and passable during the dry season only. According to the National Bureau of Statistics (NBS, 2013) in their report titled Tanzania in figures 2012, the average percentage of households with access to electricity in Tanzania Mainland was 16.6 and Zanzibar was 39.7 while the overall access for the entire country stood at 17. Further, the power tariffs are high to be affordable by a normal government and/or private employee receiving a minimum wage of 150,000 shillings ($68) per month. According to Msyani (2013) the average power usage tariff was US $12.6 cents per kWh.

The situation is different in India. With reference to CIA, the World Fact Book (2012), the country is the 5th world's largest electricity generating producing about 1,052,000,000 KWH. According to the Vasudha foundation 2014, as on 31st August 2013 only 32,227 about 5.4 percentage of 593,732 the total Indian villages inhabited as per 2001 census were not electrified.

With reference to the CIA the World Fact Book, (2015) based on the 2013 estimates, India is ranked the second largest road network in the world at 0.66 km of roads per square kilometer of land. It has a road network of over 4,689,842 km out of which 79,116 km are of national highways and expressways, 155,716 km of state highways, and 4,455,010 km of other roads. With reference to the World Bank (2004) the road coverage in Tanzania was as low as 96.2 km of roads per 1,000 square kilometers in 2002 along with a road density of 2.4km of roads per 1,000 habitants. The latest World Bank report on the Tanzania network indicated that the total network (km) in Tanzania was last measured at 103,706 in 2009. While according to the African Development Bank (ADB) in their report titled 'Tanzania Transport Sector Review' of September 2013; the road network in Tanzania currently comprises 86,472 km of roads in the formal inventory of which 12,786 km are categorized as trunk roads, 21,105 km as regional roads and the remaining 52,581 km as district, urban and feeder roads. The same

was reported by the Roads Fund Board of Tanzania in their annual report 2013/14. The classified road network was about 87,581 km where only 8.7 percent equivalent to 7,611 Km is paved and 91.3 percent are unpaved and therefore susceptible to heavy rain. The CIA the World Fact Book, (2015) based on the 2010 estimates reports that Tanzania had a total of 86,472 km of road network out of which 7,092 km (8.2 percent) was paved and the rest 79,380 km (91.8 percent) was unpaved.

However, despite the facts in most of the agro-climatically homogeneous regions, villages that have asphalted approach roads have always experienced higher growth and development compared to those that do not have such facilities, most of the villages within the case study countries are small and dispersed over the country sides lacking such development catalysts-roads, health and education. This was insisted by Desai (2012) that if we examine the road development per square kilometer area, in different states with regard to agricultural growth experienced, in these states, we will find a high degree of correlation between the two variables.

According to Dev, (2012), the government of India announced *Bharat Nirman* programme in 2005 of which one among of its six components of infrastructure development was construction of rural roads in order to improve agriculture and rural infrastructure. However, the progress has been slow in this programme. With reference to NABARD (2015), the Indian farmer has suffered not only due to restrictions on marketing and processing, but also due to poor infrastructure. To relieve farmers from such intricacy the country through NABARD with the state governments created a wide variety of rural infrastructure covering 34 activities, under three broad categories, viz., agriculture and related sectors, rural connectivity and social sectors. NABARD Infrastructure Development Assistance (NIDA) is designed to fund state owned institutions/corporations outside the sphere of RIDF borrowing. The situation that has always been leading to high transaction costs for farmers. The same situation is reported in Tanzania; the AgFiMS (2012) found that the percentage of producers in the AgFiMS market segment with access to electricity, tarmac roads, rail and harbors was significantly lower than the percentage of processors and service providers with access; thus, 85 percent producers were operating from rural areas.

3.18 General Global Trends of public expenditure on agriculture

Public investment on agriculture has received a commendable attention by most of governments of countries in the developed regions. Mogues et al, (2012) found that governments in the Asia and Pacific region appeared to focus more budgetary attention on agriculture, with per capita agricultural spending growing at 7.7 percent per year from 2000 to 2007; while it was doubled in Eastern Europe and Central Asia within the same period. But in the regions of Middle East and North Africa and Latin America and the Caribbean, situations were different. The former recorded a small fraction (2.5 percent) of agricultural expenditure of total government expenditures while the later recorded a downfall of total expenditure by 2 percent per year. Past trends of public investment in agriculture in Africa countries have historically been very low compared with that in other developing regions. They invest less in agriculture and infrastructure. Fan et al (2009) reported that African governments spend much less on agriculture than their counterparts in other developing countries, thus in aggregate, African public spending on agriculture accounted for 5–7 percent of the total national budget from 1980 to 2005 whereas for Asia the equivalent figure ranged between 6 to 15 percent. Thus, nearly half of African countries reduced their spending on the sector in this period contrary to their pledges through the Maputo declaration of 2003 except Burkina Faso, Ethiopia, Malawi, and Mali that have surpassed the CAADP threshold of 10 percent of budgetary spending on agriculture, in recent years. Despite the fundamental contribution of the sector to their economic growth most of the countries within the region have given a negligible attention to the sector. According to Mogues et al, (2012), agriculture played a vital role in SSA's economic growth, contributing to nearly 30 percent of total GDP. However, less than 5 percent of total government expenditure was allocated to the agricultural sector in this region. This has made the region to lag behind the track of meeting the MDG 1 as reported by Fan et al (2009) that the notable efforts have been recognized in many developing regions, especially Asia and the Pacific but not in Africa. Fan warned that Sub-Saharan Africa is the only region of the developing world that was expected to have more poor people in 2015 than it did in 1990. Both of the case study countries fall into the regions that have historically not done well on public investment on agriculture. Mogues et al, (2012) found that Eastern Europe and Central Asia topped the levels of public

investment in agriculture, with the high level of agricultural spending (almost $100 per person), and high intensity of agricultural spending in terms of agricultural GDP that was reported to have also doubled the sample average, at 15 percent. That across all regions, Asia experienced the most rapid growth in total expenditures of 7.4 percent per year, followed by Eastern Europe and Central Asia and Israel (ECA) at 6.7 percent per year and Middle East and North Africa (MENA) at 5.0 percent. Total government spending increased at a much slower pace in Sub-Saharan Africa (SSA) (2.5 percent) and Latin America and the Caribbean (LAC) (4.2 percent). Road development contributes enormously to the country economic growth and poverty reduction. Therefore we expect devoted efforts of government investment on infrastructure particularly rural roads to improve access to education, health care, farm inputs, market places and other services by rural population. However, this has received a slight attention by most of African governments. This is supported by Fan et al (2009) that a share of spending to infrastructure, particularly transportation and communication, has declined from 6.3 percent in 1980 to 3.7 percent in 2005. Chilonda et al (2009) in their study of Monitoring of Public Spending in Agriculture in Southern Africa, Tanzania is among the countries that tend to spend too little on agriculture. They further indicate that if the trends persist as they are at the present, only one country out of the SADC 15 will achieve the CAADP 10 percent goal by 2015. Cooksey, (2013) found that between 2002 and 2007, spending on Tanzanian agriculture ranged from 4.5 to 6.8 percent of the national budget. Cooksey related it with politics strategies; that in 2010 - 11 (an election year) it rose to 7.8 percent of total expenditure, but falling back to 6.8 percent the following year. The URT, (2011) reported that the agriculture sector share in the overall budget has dropped from 7.8 percent in 2010-11 to 6.9 percent in 2011-12 giving a simpler reason for this diminishing trend to be a large decrease in funds that had been invested in agriculture sector in 2010-11 for procurement of power tillers. Even such small amounts allocated to the agriculture sector, momentous percentages are spent on activities (recurrent expenditure) that have no direct impact to sector development. This was insisted by Ezekwesili et al, (2011). They reported recurrent spending to occupy significant share of the budget, in 2010-11 approximately 65 percent of the overall budget, equivalent to 20 percent of GDP**.** According to Gabagambi, (2009) between 2001-02 and 2008-09 the level of recurrent and development budgets for Agriculture Sector Lead Ministry (ASLM) in Tanzania have been almost at par,

although on average recurrent budget has been higher than development expenditure especially in recent years. Thus, between 2000-01 and 2011-12 the recurrent budget for MAFSC has been increasing whereas development budget decreasing and more than 90 percent of development budget is funded by Development Partners (DP) under different modalities such as loans and grants. The URT, (2011) insisted this that the recurrent budget execution of agriculture sector recorded 123.8 percent in 2010-11 compared to 119 percent recorded in 2009-10 and share of recurrent expenditure allocation in the budget in the financial year 2011-12 has increased compared to the previous one. The only simple reason given was increased government commitment on recruitment of professional staff for sectors. The report further entails that the foreign development component remained relatively high in 2010-11 recording at 86.7 percent compared to locally funded component recording 29.5 percent. But yet within the same report, the government regrets that the low rate of execution of the capital spending budget, especially in the critical infrastructure sectors such as energy, agriculture (irrigation) and other sectors, has potentially held back government efforts to significantly address earnings poverty in the country. According to URT, (2011), expenditure on agricultural sector has increased from Tsh.926.2 billion ($425 million) in 2011-12 compared to Tsh.903.8 billion ($414.6 million) in 2010-11 having positive expenditure change of 2.5 percent. However, the large portion of the sector expenditure is still allocated centrally. In 2011-12 the central allocation was Tshs.692.8 billion ($318.million), which is equivalent to 74.7 percent of sector budget compared to Tshs.234.2 billion ($107.5million) or 25.3 percent of the sector budget planned to be used at LGAs level.

Despite of belonging in the region with commendable investment on agriculture sector, India also has not performed well per se. With reference to Dev, (2012), the share of public investment in total investment to the sector over time declined from about 50 percent in the early 1980s to 20 percent in the decade of 2000s leaving a significant increase of the share of private investment from about 50 percent to 80 percent during the same period.

The linkage between identified priorities and actual expenditure is very important. In Tanzania agricultural priorities are stipulated in National Strategy for Growth and Reduction of Poverty (NSGRP) for Tanzania, locally known as MKUKUTA, They include availability

of finance; availability of arable land; investments in human capability; investments in biotechnology and agro-technologies; rural roads infrastructure, irrigation infrastructure, promotion of private sector participation in agriculture sector as well as strengthening research and extension services. These issues are addressed in different ways under the ASDP framework. Statistics show that since 2001-02 the agricultural budget in Tanzania has generally been increasing gradually. It was only TSh. 52.1 billion (U$55million), equivalent to 3.0 percent of the national budget in 2000-01 and since then it had more than doubled to 7.8 percent in 2010-11. In fact, during the last two decades (2001-02 and 2010-11), the real budget (value) for agricultural sector has ranged between 4.9 - 48.4 percent of the reported nominal budget (Gabagambi, 2011). Nevertheless, about 90 percent of the development budget is funded by Development Partners (DP) under different modalities such as loans and grants which are uncertain. For example for the year ended June 30th 2010 five key DPs namely International Development Association (IDA), International Fund for Agricultural Development (IFAD), African Development Bank (ADB), Japan, and Irish Aid, pledged to contribute US$ 91,492,204 but contributed only US$ 86,174,563.52 reports the Controller and Auditor General (CAG, 2011). This implies not only that the government spends very little amount of money on agriculture from own sources but has no control on the flow pledged funds from DPs for the sector development. This is not sustainable because economic and social problems are directly conveyed into Tanzania's economy.

Proper decisions on which social and economical factors should governments spend is very essential. Agricultural investments might include investment in general R&D, in rural infrastructure, and in particular crop types or specific technologies but the composition of government expenditure reflects government spending priorities Mogues et al (2012). Public spending on agriculture is coupled with different agricultural priorities that vary from one region and/or area to another viz. agricultural mechanization; improvement of crop production; irrigation infrastructure, insurance, postharvest and market infrastructure. Governments should have adequate and sufficient information about which types of public investments contribute the most to development goals as insisted by Lugo, (2011). Despite his confession about the effectiveness of subsidies in pushing agricultural growth in India, Dev, (2012) warned that they do not become an enduring element of the country economy.

Consequently, public investment in agricultural research may be geared toward improving the productivity of smallholders through new varieties of crops and livestock that will obviously reduce the price for these crops through productivity improvements while rural transport infrastructure can induce greater competition among market intermediaries. Agricultural growth can be achieved through investment into other sectors that have direct influence into the sector. Dev, (2012) observed that public investment in rural physical infrastructure like roads, electricity, marketing, irrigation and social infrastructure like education and agriculture research influences agricultural growth.

Among all areas demanding agricultural public investment for poverty reduction and economic growth, R&D has shown consistence effect. Upon comparing the returns to investments in agricultural research with those on public investments in other activities, Mogues et al (2012) observed that the superiority of the former emerges across most studies undertaking such comparisons. The dollar-for-dollar impact of R&D public spending on agricultural production or productivity is greater than the equivalent returns for public spending in other activities directly related to the sector, such as irrigation, extension, and fertilizer subsidies and other sectors, such as rural road infrastructure, education, electrification, health, and telecommunication.

3.19 Problems faced by the governments on public spending

Economic theory has recognized public expenditure as the engine of economic growth. However, it is facing a collection of setbacks ranging from political, technological and institutional within both developed and developing countries particularly sub Saharan African countries. Several studies (Fan et al, 2011; Lugo 2011; Chilonda et al 2009; Fan, 2009; Kweka and Morrissey 2000; etc) have spotted out the challenges hindering public spending implementation in different approaches. Lack of adequate information has been one of the main problems that hinder effective public spending particularly in developing countries. Efficient allocation of public resources demands both adequate and relevant information and transparent public spending practices. (Lugo, 2011) insisted that reliable data on government expenditure in priority sectors, such as agriculture, health, education, is a key element into the analysis of public policy effectiveness. In most cases public resources

are limited with competing demands. We therefore need prioritization to set policies on public spending programs in the agriculture sector and its different sub-sectors based on their prospected outcome on the poor. Only R&D can draw a path on how scarce resources should be allocated across different sectors of the economy such as agriculture, infrastructure, health, and education for maximizing development outcomes, or within a sector how should resources be distributed by priorities. Chilonda at ell (2009) found that investments in core public goods - science, infrastructure, and human capital - combined with better policies and institutions are major drivers of agricultural productivity growth. However, in most of the developing countries including the case study countries according to Fan, (2009) relevant and adequate information to guide policymakers on how best to allocate scarce public resources are limited. According to Fan et al (2009) governments' efforts to increase agricultural spending and boost agricultural growth of developing countries are limited by a dearth of information about which types of public investments contribute the most to development goals. Within a sector for example agriculture, how should resources be allocated among, for instance, agricultural research, extension, irrigation, and input subsidies? They further narrated that in some cases African countries have clear principles on how to prioritize their scarce public resources, but they often lack the information needed to operationalize these principles. Lack of qualified personnel also hinders effective public spending in most of the developing countries including Tanzania. According to URT, the survey by PWC in 1999 jointly commissioned by government of Tanzania and DfID on Public Expenditure Tracking Study (PETS) in three districts – Kondoa, Kiteto and Hai (in Dodoma, Arusha and Kilimanjaro regions, respectively) found that most district councils had weak accounting mechanisms (there were no qualified accountants in any of the three councils). Poor infrastructure, corruption, embezzlement, ignorance of the general public, are some among many drawbacks that have made it difficult to fully realize public spending objectives in many developing countries and some developed countries as well. Gabagambi (2011) warned that increasing budget should be proportional with proper supervision of their implementation transparently and high level of accountability. But currently it is very much likely that on paper the allocation is fine, but on the ground money ends up in the pockets of a few elites added Gabagambi.

Poor management of meager resources by respective governments also deters effective government spending. For example in Tanzania the CAG, (2013) in the 2011-12 audited report noted that the government had entered into agreements with different investors to facilitate construction projects. However, there were no evidences of its adequate involvement in the process of construction hence the possibility to bear huge costs through overpriced bills of quantities. Irrational allocations of public funds to lower levels from central governments also hold back the process. Allocation of agricultural budget does not observe food security situation in the country. In Tanzania for example, according to Gabagambi, (2011), ten mainland regions namely Arusha, Kilimanjaro, Lindi, Manyara, Mara, Mwanza, Mtwara, Shinyanga, Singida and Tabora are identified as endemically food insecure places. However, during 2009-10 financial year, the 10 regions which formed about 50 percent of all the regions and contained 46.2 percent of the population in the country were allocated only 30.2 percent of the national DADP budget. Resources are allocated disproportionately depending on political prominent of government executives.

Lawson and Bird (2008) insist budget transparency as an influential dialogue, which puts information on public spending into the public domain and helps to ensure greater consistency between stated priorities and actual spending. This provides a ready channel for influencing both the level and composition of spending. However, transparent of public budget by the Tanzanian government is highly questionable. According to Gabagambi (2011), budget transparency has been revealed to be a critical problem in tracking public fund at Local Government level the situation that leads into difficultness to ascertain whether funds reaches intended beneficiaries, especially smallholder farmers. According to the global Open Budget Survey for 2012 by the International Budget Partnership (IBP) Tanzania scored 47 percent occupying the 51st position among the 100 countries surveyed. It ranked last among the former three East African sates of Kenya, Tanzania and Uganda. India scored 68 percent occupying the 14th position among the 100 countries surveyed while ranking the first within her region in the continent. Lack of consistent and relevant data hinders soft implementation of public investment. Studies by Kweka and Morrissey (2000) found that data inconsistency, improperly classification of expenditure categories, and omitted factors are problems with obvious effects to the growth process.

Insufficiency of resources assumes the great role among factors that hold back elastic public investment. Dewan and Ettlinger (2009) noted that large and sustained deficits pose an economic and political challenge. This usually results into reduced national savings and domestic investment, lower future incomes, and lead to high interest rates and inflation that are damaging to the economy and residents while affecting exchange rates. High debt levels also mean large debt-servicing costs, which limit a government's ability to make needed investments.

IFPRI (2006) in their studies on expenditure growth rates concluded that increasing spending on agriculture must be complemented with adequate knowledge about how resources can be efficiently allocated among competing development priorities. With this regard, Gabagambi (2011) insisted that both quantity on one side and quality and placement of resources should be considered equally.

In summary, a combination of different studies by various academicians and intellects has revealed the importance of both agriculture sector and public spending on the sector. They are two interconnected aspects where the former is a dependant of the later. The economic theory has recognized public expenditure as the engine of economic growth. It is now clear that agriculture sector is an important sector among many others for the economic growth of most of developing countries including the case study countries. Its contribution to the national GDP between 26 and more than 30 percent and provision of livelihood to about 80 percent of rural population has made it a major sector in the economy. This means there is a direct positive correlation between public spending, agriculture sector and rural development on the other hand. Thus, the prosperity of the sector depends greatly on public investment through a numerous of factors viz. availability of enough but fertile land, use of certified high yielding seeds, agriculture mechanization, availability of experts – agricultural researchers, fertilizer consumption, availability of affordable irrigation facilities, PHL management, agricultural marketing, banking and/or financial facilities, agriculture insurance and general infrastructure that covers roads, electric power and water supply. Notwithstanding of the governments' initiatives to support the sector, agricultural productivity within the case study

countries and their respective regions was termed as low compared with other countries of the world and their respective regions. However, most of the theory echoed in favour of India as compared to her counterpart – Tanzania. This means to some extent India has made remarkable initiatives to support the sector through public investment. However, there seems to be a lagging gap between the importance of the sector and availability of clear and effective policies for supporting the sector not only within the case study countries but even other developing countries. The gap between the general public expectations on government spending on the sector and the actual situation has been becoming broader from time to time. Several factors were related to such poor performance within the case study countries viz. technological; institutional (low consideration of the sector by respective governments and limited relevant information); climatic and physical factors (low soil fertility, uncertainty rain fed farming associated with floods and droughts); financial factors like lack of credits and backup upon farming failure by either cause; and social factors (fast population growth and urbanization). Both agriculture sector and public investment on the sector were termed as the major catalysts of economic growth in most of the developing regions. More are expected from this study in comparison of the two pertaining to the topic under the study.

3.20 The research gap

Several previous studies have been focussing on either of the two features - agriculture sector or public spending individually by indicating their importance to the economy of the respective national or state. However, neither of them ever carried out a study on the relationship between the two features pertinent to the economic growth of a particular country nor a comparative study between two countries in connection to the same. In view of this, the researcher decided to conduct this study with an aim of assessing the socio economic benefits resulting from public investment to agriculture sector by the governments of the two countries India and Tanzania by considering the important indicators relevant to the growth of the sector. This has developed a wide research gap due to various factors ranging from the purposes of the research, methodologies used, coverage and scope of the study, parameters and variables considered during the research.

CHAPTER - 4

Research Methodology

4.1 Introduction

Research methodology is an important aspect of any research work as it provides a clear path to go through from the stage of developing the study up to data analysis. It helps to draw a comprehensive but relevant outline of the study by defining variables, setting objectives of the study from which both the research questions and hypotheses are born. This further helps to guide the researcher to move along or within the defined scope of the matter under the study. With clear research methods, it becomes easier for a researcher choose the appropriate data collection methods and techniques, population size and sampling methods that finally will help to come out with conclusion and relevant recommendations.

4.2 Objectives of the study

This study aimed to assess the relationship between the public investment on agriculture sector and the relevant contribution of the sector to the economic growth of the respective case study countries.

Overall objective

The overall objective of the study was to ascertain the socio economic benefits resulting from injection of public resources to agriculture sector by the governments of the respective case study countries.

Specific Objectives

Based on different literatures, discussions with other academicians and policy implementers and the current situations within the case study areas the researcher has identified the following specific objectives:

1. To ascertain the role and responsibilities of government on agricultural development.
2. To ascertain the government exertion on proper management of public resources allocated to the sector.
3. To analyze the trends of disbursement of budgeted and approved funds to the agriculture sector from central government
4. To analyze the trends of budget allocation to agriculture sector and the current percentage of agriculture funding as a part of total annual budget.
5. To evaluate the general trends of public investment to the sector pertinent to its respective contributions to the national GDPs for the last ten years.
6. To ascertain the level of government support to agricultural stakeholders in all steps of crop farming cycle until the farm produce reaches the final consumer
7. To evaluate the level of agricultural stakeholders satisfaction with government support to promote the sector growth and improve their economy through farming
8. To identify the problems faced in agricultural public spending by the case study countries and suggest way forward for improving public spending on agriculture sector

The following were the guiding parameters to measure such social and economic impacts resulting from public investment on the sector:

(i) Land acquisition & development	(ii) Budget allocation trend
(iii) agriculture mechanization	(iv) Expenditure management
(v) affordability of agriculture inputs	(vi) Clop loans
(vii) agriculture subsidies	(viii) First call centers
(ix) capacity building	(x) Special agriculture financial facilities
(xi) fertilizer consumption	(xii) Agricultural value addition
(xiii) food production promotion	(xiv) Value addition

(xv) storage facilitation	(xvi) Marketing
(xvii) irrigation promotion	(xviii) Export support
(xix) Food security status	(xx) Insurance
(xxi) Variability of food prices	(xxii) Post harvest losses management
(xxiii) Infrastructure – water, electricity and rural/farm roads	(xxiv) Percentage of arable land equipped for irrigation
	(xxv) Number of agricultural researchers

4.3 Research Hypotheses;

For overall objective:

Ho: There is no correlation between public investment and agriculture development.

H1: There is a correlation between public investment and agriculture development.

For specific objective:

H1: Government does not play significant role in the agriculture development

H2: The governments have not managed properly public resources allocated to the sector for its effective growth

H3: There is no specific government priority for public investment on agriculture sector

H4: There is no correlation between budgetary allocation trends and government commitment to promote the sector growth.

H5: Public investment trends to the sector have not considered its respective contributions to the national GDPs.

H6: The government has not devoted appropriate support to agricultural stakeholders in all steps of farming cycle to improve their individual economy and the whole sector growth

H7: Agricultural stakeholders were not satisfied with government support to agriculture activities for improving their individual economy and the whole sector growth

H8: There are no problems faced by the government pertaining to agricultural public investment.

4.4 Scope of the Study

The term agriculture is a wide concept and covers a variety of activities varying form one region to another depending on nature of both geography and the society and economic activities viz. crop farming, animal husbandry, agro forestry, fishing, aquaculture, sericulture, etc. For the purpose of this report, agriculture refers to crop farming. Within this particular activity, the researcher assessed the economic and social reward resulting from public investment on agriculture sector by the respective governments of the case study countries while exploring the principal responsibilities and/or accountability of the respective governments on agricultural development; comparing government priorities for public investment and actual expenditure on the sector and food security-related expenses; identifying trends of budget allocation to the sector and the current percentage of agriculture funding as a part of total annual budget in each of case study country; ascertaining general trends of public investment to the sector and respective Socio Economic outcomes from the sector for the last ten years within the case study countries; and, identification of problems faced by stake holders in agricultural public spending within case study countries together with suggestions for what should be done respective case study countries for improving public investment on the sector. This means the study focuses on public investment on agriculture sector – crop farming (food grains, cereals and horticulture) only by the respective governments of the case study countries. Thus, agricultural allied activities such as animal husbandry, agro forestry, fishing, aquaculture, sericulture, etc and heavy investment on basic infrastructure such as telecommunication, industries, transportation, etc were not incorporated within this study. It was conducted within Tanzanian and the selected states of India as a comparative case study.

4.5 Research design and techniques

With this particular study, the research was a descriptive single case study to allow a variety of data collection within the selected areas and government institutions of the two case study countries. Both qualitative and quantitative techniques were adopted. For unique findings exploratory techniques were used to give rooms for the researcher to analyze issues in details respectively.

4.5.1 Population of the Study

The targeted population for this study was both non famers from different institutions from local government to central government on one side and all rural population - farmers particularly all from the selected states in India and regions in Tanzania respectively. Non farmers' respondents encompassed top level government member of staff especially senior officers from ministries of finance and agriculture in Tanzania and India respectively; senior officers from national statistics bureau in Tanzania and the statistics department from selected states in India respectively and senior officers from selected regions in Tanzania and selected states in India and local governments respectively. Others were senior officers from departments of finance, economics and statistics, agriculture and co-operation, food and civil supplies, land and development, Information, rural development and energy and petro chemicals from selected states in India respectively. For farmers and non-farmers respondents purposive sampling techniques were applied for establishing relevant samples from the targeted population from each state/region in each of the case study country respectively.

4.5.2 Targeted group

The targeted groups were rural population especially small size farmers and peasants who were sought to be major beneficiaries of public spending on agriculture sector from both of the case study countries.

4.5.3 Sample size

Total sample size for this study was 1,320 with an average of 660 respondents from each case study country. Out of these, 600 were farmers while 60 were non farmers from different government institutions within both of the case study countries respectively.

4.5.4 Sampling Techniques

This empirical analysis is conducting in order to determine the relationship between government expenditure in agriculture sector and economic growth. When concerning about the population and sample selection, two states of India, which consisting 120 million population and out of which 70 million are farmers have been treated as the population for

this analysis. Similarly in Tanzania 7 regions consisting of 16 million population and out of which 9.5 million are farmers have been treated as the population for this analysis. Among these states and regions 1,200 farmers are selected as the sample based on the main criteria geographical areas and land holding i.e. marginal, small and medium farmers which differentiate the economic status and their standard of living. The selected officials involved in implementation of the policy making related to agriculture development.

Both primary and secondary data were treated evenly. All the variables are expressed in US dollars and estimated to an annual basis. The data is drawn from the government reports and publications, websites, institutions, UN Database, FAO and World Bank publications covering the time period from 2005-06 to 2014-15.

4.5.5 Sources of Data

Two major and common types of data sources are known as primary and secondary sources. Primary data sources are those from which respective data are being collected for the first time by the researcher from the field. In other words secondary data sources are those that provide data that have already been used by others for other purposes. According to W.A. Neiswanger (as quoted by Singh 2012) a primary source is a publication in which data are published by the same authority which gathered and analyzed them, while a secondary source is a publication, reporting the data which have been gathered by other authorities and for which others are responsible. To this particular study, both primary and secondary data sources weighted equally. Secondary data were collected from different government ministries, institutions, departments, reports, publications, circulars and government websites of both of the case study countries respectively and other reliable international institutions (sources) reports and publications and individual reports and publications. With secondary data the researcher aimed to ascertain trends and statistical statuses of the studied matter from time to time. Primary data were collected from respective selected rural population through individual beneficiaries particularly farmers and non farmers civilians. With primary data the researcher aimed to avoid biased (single source based) findings and reports on the matter

under the study by putting in plain words about the actual situations within the case study countries from respective prospected beneficiaries.

4.5.6 Data Collection Tools

For an easy amassing of both primary and secondary data different data collection tools were applied:

Questionnaires*:* based on the nature and education level and/or communication ability of the targeted respondents, printed survey questionnaires in different languages (English, Gujarat, Mahrath and Kiswahili) were distributed to the respondents obtained from the sample and the public respectively to determine their perception on the public spending and its relevant impacts on the social and economic factors. All questionnaires for government officials were in English language in both of the case study countries while the language of questionnaires for farmers in Tanzania was Kiswahili throughout the surveyed regions whereas it varied from one state to another within the surveyed states in India respectively (Appendix B - D).

Personal Interviews: face to face interviews with both government officials and the earmarked beneficiaries of public spending from different areas of the desired jurisdiction were conducted from time to time. Respondents were given opportunities to give their views on the various aspects on public spending and respective outcomes relevant to agriculture sector within both of case study countries.

Observation*:* Participatory approaches through the routine government's activities particularly at lower levels were exercised whenever it could be possible.

4.5.7 Data Collection Techniques

For effective data collection outcomes, different data collection techniques were applied:

Official Introduction: for an easy entrance and access to targeted data sources and/or respondents, official introduction letters from both the current employer and the research centre pertaining to the researcher were issued (Appendix E and F). These had to be submitted to the prospective targeted respondent or offices at least four weeks prior to the scheduled dates for commencement of data collection. However, in some areas particularly government offices, issues were not as smooth as expected. It could demand even ten to twelve weeks for just acquiring access permission into a particular firm for commencing the

exercise of collecting respective data apart from the uncountable 'come tomorrow' promises by the individual officials to whom the researcher was attached to for further data digging .

Hire of Translators: for easy communication between the researcher and his respondents, in most of the surveyed rural areas especially in India the researcher had to hire translators for both converting written questionnaires for both primary and secondary data from English to respective local languages and interpretation during direct conversation between the researcher and local people whenever was required.

4.5.8 Statistical Tools

For a researcher to come out with thorough and scientifically valid analysis of his survey to be used to draw a sound conclusion, statistical analysis tools that range from simple to sophisticated scientific one assume a major role. Data analysis encompasses of different activities from data processing up to testing of hypotheses. For this particular study, both simple and sophisticated scientific methods and/or instruments were used. Simple correlation methods and tools like spreadsheet were applied for data processing tabulation and graphical presentation of data while sophisticated scientific instrument SPSS was applied for data analysis.

Both qualitative and quantitative data analyses were used. However, qualitative analysis assumed a major part. Hypotheses were tested using both types; parametric and non parametric tests. However, nonparametric tests covered a significant part. This was due to the nature and size of the involved data.

CHAPTER - 5

Data Analysis and Interpretation

5.1 Introduction

Generally data analysis encompasses data inspection, cleansing, converting and modeling in order to ascertain functional information relevant to the study by testing the hypotheses and answering relevant research questions for suggesting conclusions and supporting decision-making. The business dictionary has defined it as the process of evaluating data using analytical and logical reasoning to examine each component of the data provided. Data from various sources is gathered, reviewed and analyzed to form logical findings which then are being used to draw sound conclusion. Data analysis encompasses of different activities from data processing up to testing of hypotheses.

To accomplish this process in a meaningful way for a sound conclusion, statistical analysis tools assume a major role. For this particular study, IBM SPSS Statistics 20 was applied as the major tool. For processing, tabulation and graphical presentation of data MS Excel (Spreadsheets) were applied. Both qualitative and quantitative data analyses were used. The research hypotheses were confirmed by using different tools including exploratory factor analysis and regression analysis.

5.2 Reliability Test

Before proceeding with data analysis, the researcher decided to ensure himself about the internal consistency and/or reliability of the collected data using the developed questionnaires. He therefore applied the Chrombach Alpha reliability test to measure the closeness of the related items in the groups.

Table 5.1: Chrombach Alpha Reliability Test

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
.855	.845

Interpretation

From Table 5.1 the Chrombach alpha value is 0.855 indicating that there is a high level of internal consistence of the data from the specified sample.

5.3 Stakeholders' access to key elements of farming activities and their application for effective sector growth

- **Land ownership**

With this particular study, land is deemed as the key factor for the better execution of the farming process no matter the size of involved person. Therefore the researcher tested land access for farming in two aspects – proportional of gender in land ownership and the size owned by a particular person.

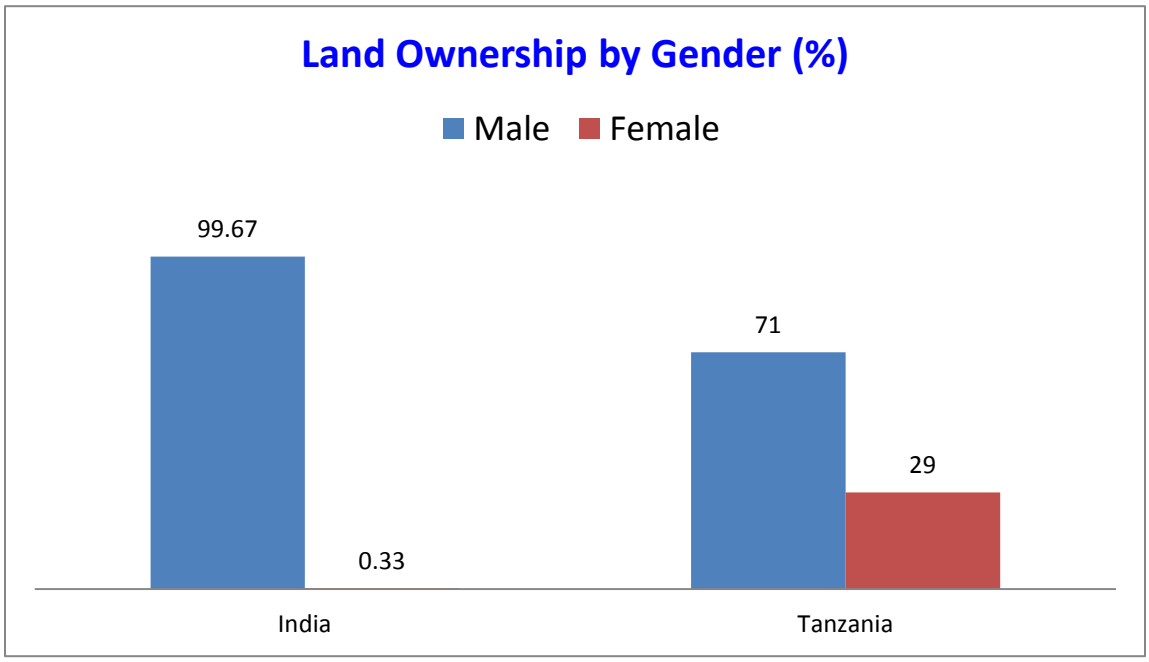
- **Land Ownership by gender**

Table 5.2 Land Ownership by Gender in India and Tanzania

Particulars	Male	Female	Total
India	599	2	601
Tanzania	428	173	601

Source: Survey Data

Fig. 5.1: Comparison of Land Ownership by Gender in the Case Study Countries



Source: Survey Data

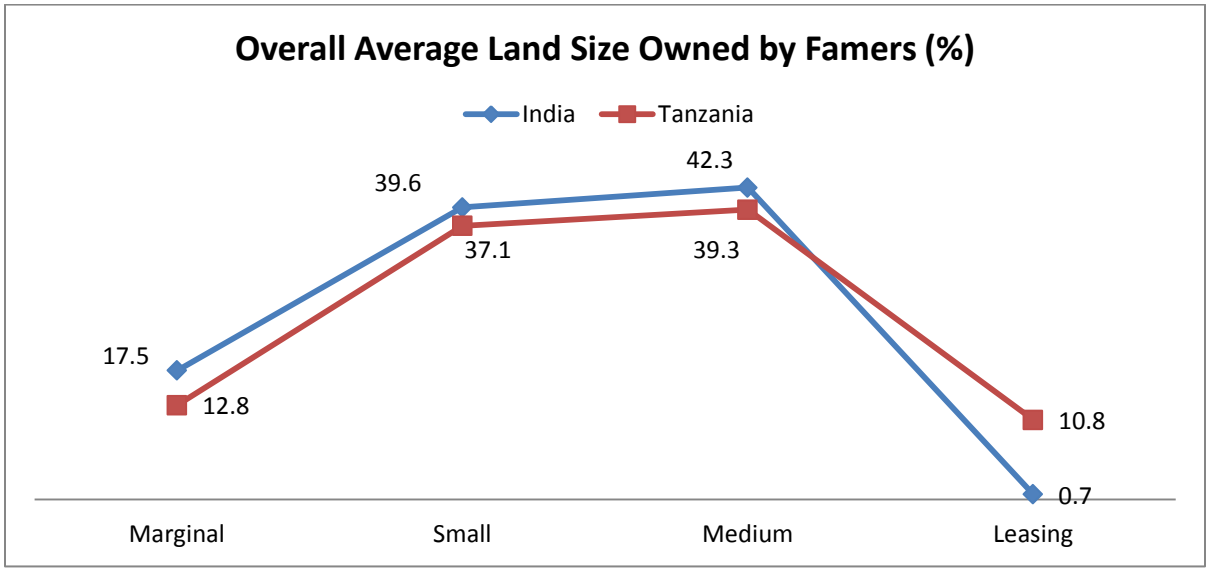
- **Overall Average Land Size Owned by Famers**

Table 5.3: Average Land Size Owned for Farming in India and Tanzania

Country	Particulars	Marginal	Small	Medium	Leasing	Total
India	Frequency	105	238	254	4	601
	Percent	17.5	39.6	42.3	0.7	100
Tanzania	Frequency	77	223	236	65	601
	Percent	12.8	37.1	39.3	10.8	100

Source: Survey Data

Fig. 5.2: Overall Land Size Owned for Farming in the Case Study Countries



Source: Computed from Survey Data

Interpretations

From Table 5.2 and Figure 5.1 it is observed that the importance of equal gender access to landholdings for agriculture has not been emphasized within both of the case study countries. The data give the impression of women being neglected from land access and control for agriculture purposes. The situation is even worst in India where less than one percent of women are involved in land access for farming. Tanzania for somehow, has shown commendable situation on this whereby at least more than 25 percent of interviewed respondents were women owning pieces of land in different sizes for agriculture purposes.

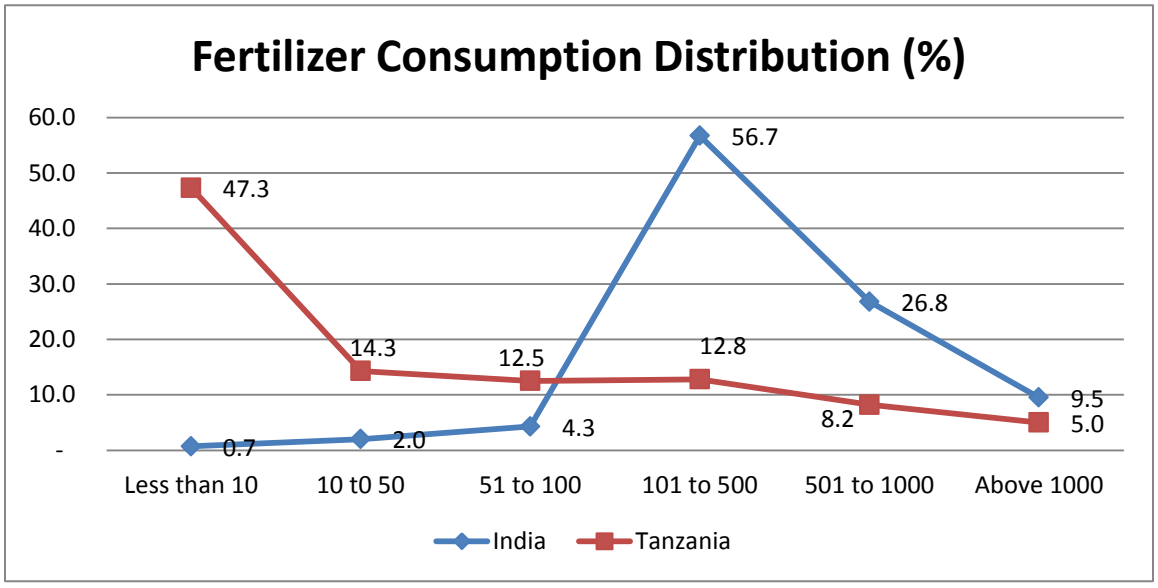
Owning land is one aspect and of which size and for what purposes is another. As it can be observed from Table 5.3 and Figure 5.2 respectively, on average 15 percent own land less than 1ha, 40 percent had land pieces of up to 2ha while about 41 percent confessed to own pieces of land bigger than 2 ha. This depicts that agriculture within both countries is still dominated by small scale (subsistence) farming. On land leasing farmers in India showed less involvement on this where only less than one percent was noted compared to almost 11 percent of farmers from Tanzania who were farming on leased land only.

- **Fertilizer consumption**

Table 5.4: Average Fertilizer Consumption (Kg/ha) in India and Tanzania in last 3 years

Particulars	India		Tanzania	
	Frequency	Percent	Frequency	Percent
Less than 10	4	0.7	284	47.3
10 t0 50	12	2.0	86	14.3
51 to 100	26	4.3	75	12.5
101 to 500	341	56.7	77	12.8
501 to 1000	161	26.8	49	8.2
Above 1000	57	9.5	30	5.0
Total	**601**	**100.0**	**601**	**100.0**

Fig. 5.3: Comparison of Fertilizer Consumption from surveyed Areas (Kg/ha)



Source: Survey Data

Interpretations

From Table 5.4 and Figure 5.3, data suggest better performance for India with an average per hectare consumption of 531 compared to Tanzania with 193 kg/ha. Further, majority of farmers (more than 74 percent) in Tanzania fall into a group consuming less than 100 kg/ha compared to India in which only 7 percent of farmers fall into such group.

To the converse majority of Indian farmers (84 percent) fall into a group who consume fertilizers between 101 and 1,000 kg/ha while about 10 percent consumed above 1,000 kg/ha as compared to Tanzania in which only 21 percent consume fertilizers between 101 and 1,000 kg/ha while 5 percent consumed above 1,000 kg/ha. Refer Figure 5.3.

This means although India is not the best within her region, it has invested enough resources to this aspect and stands in a good position compared with other countries in the same region. Tanzania is far lagging behind her counterpart on this aspect meaning they have not considered it as the major part for the sector development.

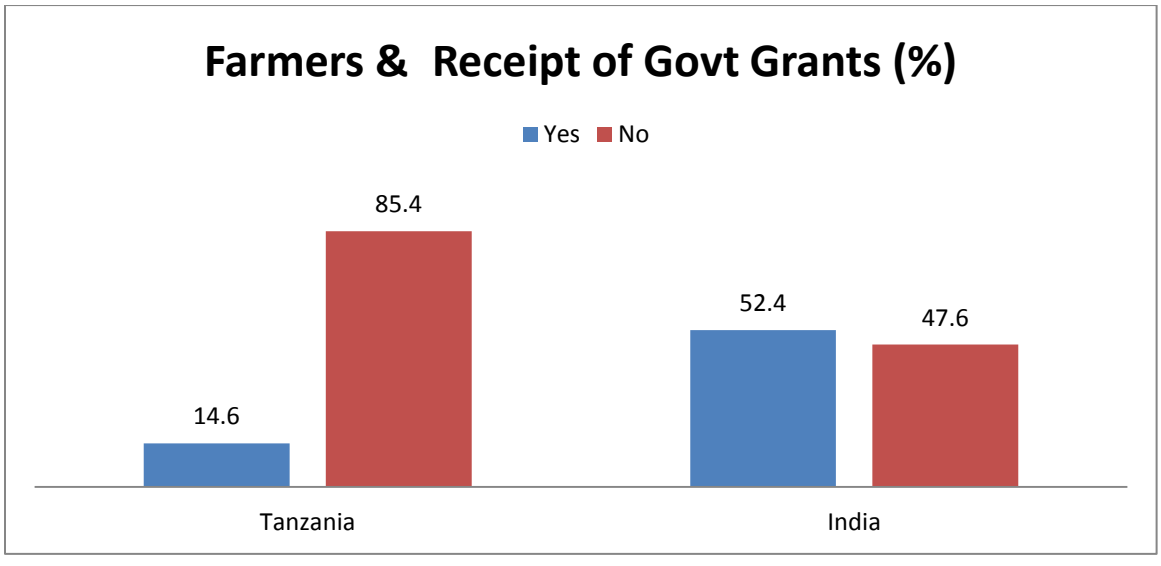
- **Sources of Funds for Financing Agricultural Activities**

Table 5.5: Availability of loans or Government subvention to finance agriculture

	Tanzania		India	
	No. Respondents	Percent	No. Respondents	Percent
Yes	88	14.6	315	52.4
No	513	85.4	286	47.6
Total	601	100.0	601	100.0

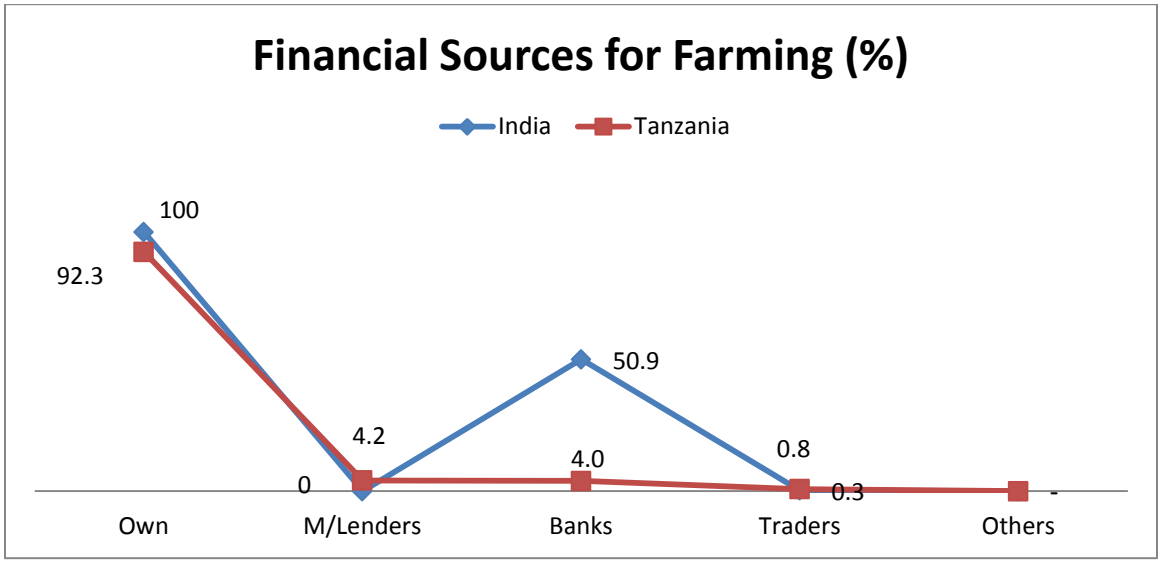
Source: Survey Data

Fig. 5.4: Distribution of Farmer who ever received Government subventions to finance agriculture



Source: Survey Data

Figure 5.5: Sources of funds to finance farming activities



Source: Survey Data

Interpretation

From Table 5.5 and Figure 5.4 it is observed that farming within both of the case study countries is challenged with insufficient financing facilities. While more than 50 percent of respondents in India ever received Government subventions to finance their farming activities, it was even less than 15 percent in Tanzania.

From Figure 5.5 almost all farmers within the case study depend on informal and uncertain (own) financial sources to facilitate their farming activities. A few do depend on other alternatives - banks and other financial institutions. More than 50 percent of Indian farmers are boosted up by banks and other financial institutions compared to less than 5 percent of Tanzanian farmers.

This means agricultural activities in Tanzania are highly exposed to individual farmers' informal and uncertain financial sources different to India where at least an half of them could get loans from banks and financial institutions.

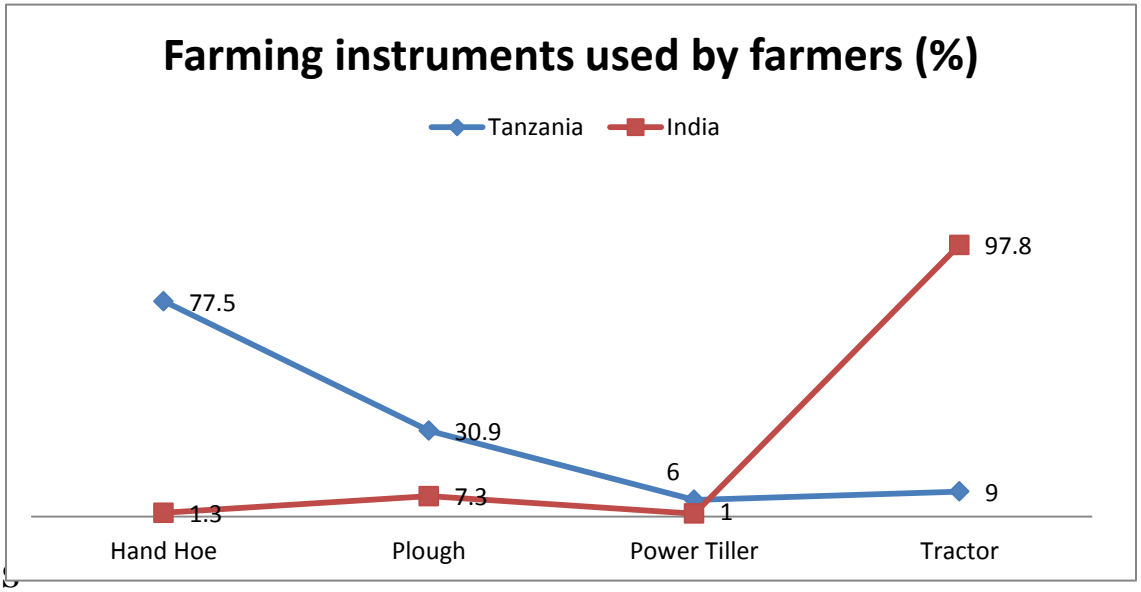
- **Agriculture Mechanization**

Table 5.6: Farmers and Types of Farming Instruments they Use

Type of Tools	Tanzania		India	
	No. Farmers	Percent	No. Farmers	Percent
Hand Hoe	466	77.5	8	1.3
Plough	186	30.9	44	7.3
Power Tiller	36	6	6	1.0
Tractor	54	9	588	97.8

Source: Author's Computation using Surveyed Data

Fig. 5.6: Farmers and Types of Farming Instruments they Use (%)



Source: Surveyed Data

From Figure 5.6 it can be interpreted that agriculture mechanization is in the converse relationship within the case study countries. While in Tanzania it is dominated by hand hoe and plough about 78 and 31 percent respectively, Indian farming activities are dominated with tractors with about 98 percent of interviewed farmers being using tractors for agriculture. The major reason for such situation was high importation costs of farming instruments as they are all being imported from different countries including

India plus low government support. This means that the Tanzanian government should invest in self manufacturing industries rather than importing as they are doing now.

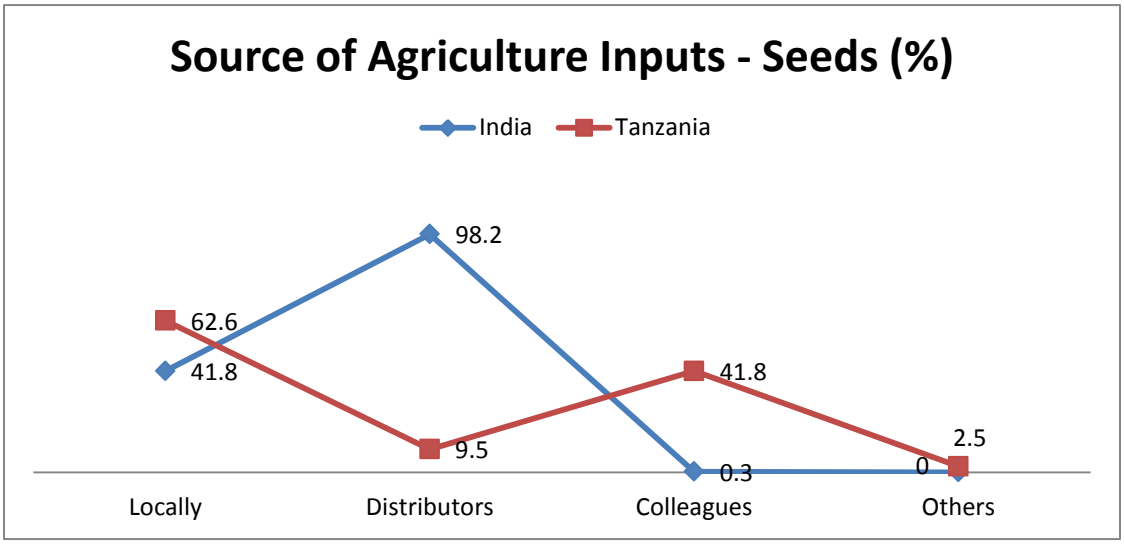
- **Use of certified high yielding seed (source of agricultural inputs)**

Table 5.7: Number of farmers and their sources of inputs (seeds) for farming

Particulars	Tanzania		India	
	No. Farmers	Percent	No. Farmers	Percent
Locally	376	62.6	251	41.8
Approved Distributors	57	9.5	590	98.2
Colleagues	251	41.8	2	0.3
Others	15	2.5	0	0

Source: Survey Data

Figure 5.7: Comparison of Farmers & their sources of inputs (seeds) for farming (%)



Source: Survey Data

Interpretation

From Figure 5.7 it can be interpreted that almost all farmers in India (about 98 percent) depend on seeds (inputs) from approved farm implement distributers. This implies a likelihood of high crop yielding from their farming.

In Tanzania a very minor portion of farmers use seeds from approved distributors. Most of farmers (about 63 percent) depend on their locally own reserved seeds (inputs) and

from their colleagues (about 42 percent) both of which are not appropriate for high crop yielding.

- **Public storage facilities**

Table 5.8: Test of Existence of Public Storage Facilities in local areas

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Availability	392	65.2	121	20.1
Not Available	209	34.8	480	79.9
Total	601	100	601	100

Source: Survey Data

Table 5.9: Test of access of public storage facilities available in local area in a year

Chance	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Never	372	94.9	109	90.1
Once	18	4.6	12	9.9
Twice	2	0.5	0	0
Total	392	100	121	100

Source: Survey Data

Table 5.10: Test of level of Satisfaction of the Services (%)

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Highly Satisfied	-	-	-	-
Satisfied	384	98.0	54	44.6
Neutral	4	1.0	1	0.8
Dissatisfied	4	1.0	5	4.1
Highly Dissatisfied	-	-	61	50.4
Total	392	100	121	100

Source: Survey Data

From Table 5.8 it can be interpreted that public storage facilities are very limited in Tanzania with only 20 percent of respondents aware of their existence within their local areas compared to more than 60 percent of Indian farmers who confessed for availability of the same.

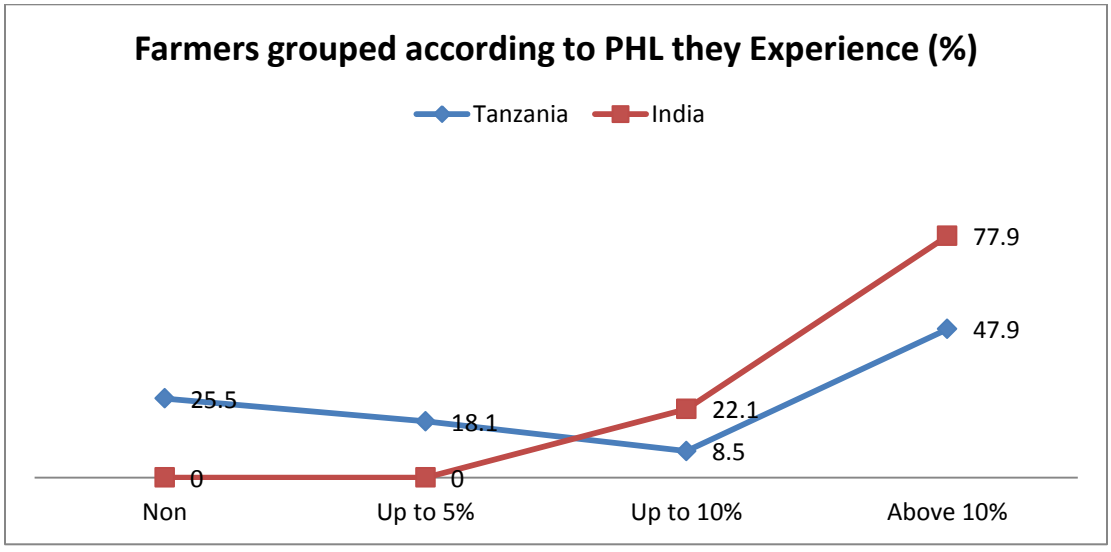
From Table 5.9 it is interpreted that the access to the available public storage facilities within the local areas is limited to a few nominated farmers. Only 20 and less than 10 percent of farmers in India and Tanzania respectively who confessed the availability of public storage facilities within their local areas agreed to have used them at least once. From Table 5.10 it is interpreted that farmers who access the available public storage facilities within the local areas in Tanzania are hardly satisfied with such services at about 45 percent level of satisfaction compared to 98 percent of Indian farmers.

- **Post Harvest Losses Management**

Table 5.11: Farmers and Post Harvest Losses they Experience in each country

PHL Levels in Percentages	Tanzania		India	
	No. Farmers	Percent	No. Farmers	Percent
Non	153	25.5	0	0
1 to 5%	109	18.1	0	0
6 to 10%	51	8.5	133	22.1
Above 10%	288	47.9	468	77.9
Total	**601**	**100.0**	**601**	**100.0**

Figure 5.8: Distribution of PHL as experienced by farmers in each country

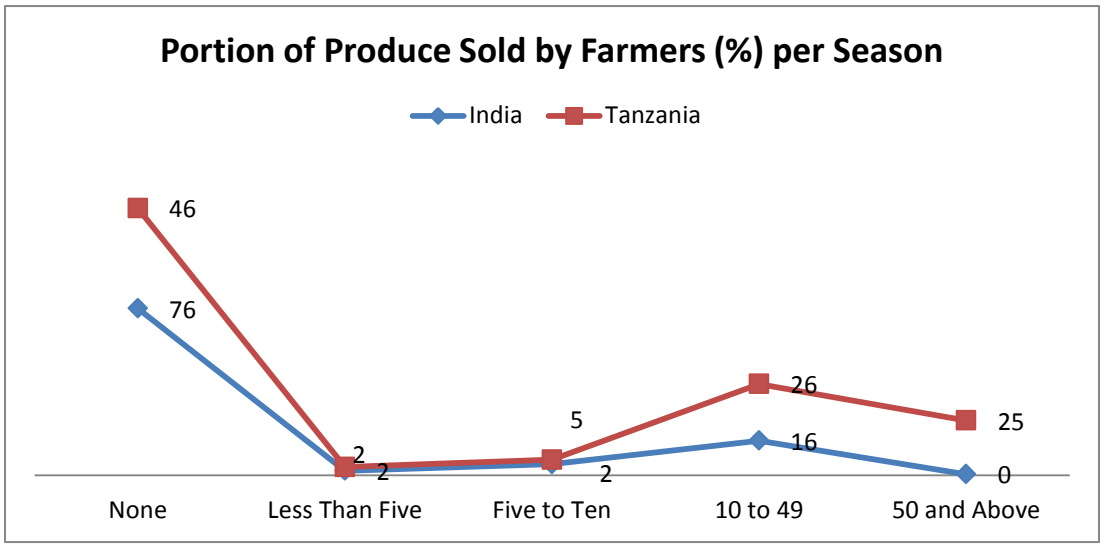


Interpretation

From Fig. 5.8 Post harvest losses are highly experienced by Indian farmers. About 78 percent of farmers experience losses of more than 10 percent of their produce per season. In Tanzania the problem is spread to all levels from less than 5 to more than 10 percent of the produce per season. More than 25 percent do not experience the problem because of their nature, i.e. subsistence farming.

- **Locally sale and/or export of agricultural produce**

Figure 5.9: Percent of agricultural produce sold locally or exported per season



Source: Survey Data

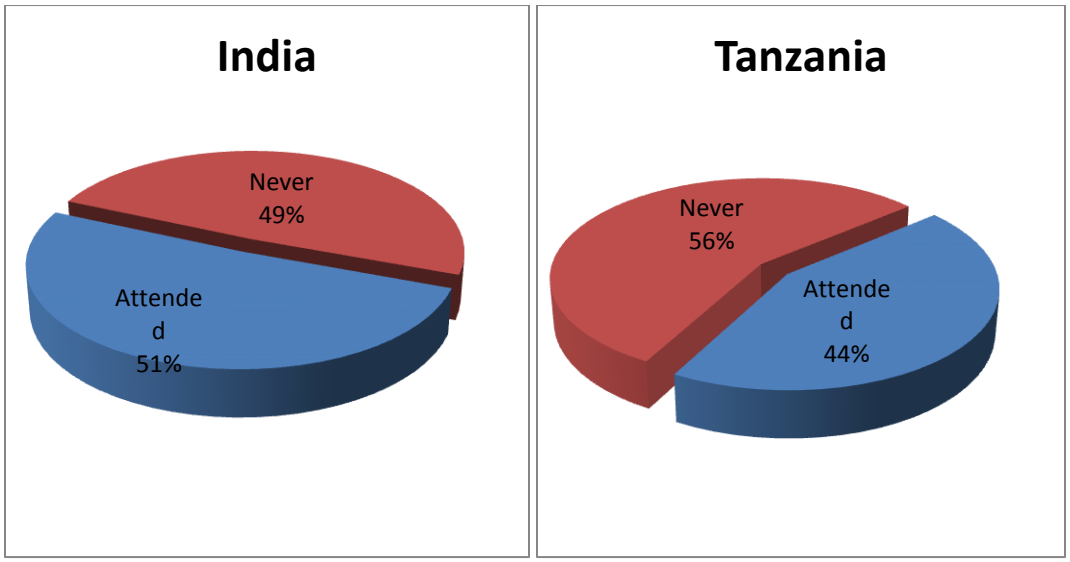
Interpretation

More than 76 percent of farmers in India do not sell any portion of their farm produce per season while only 16 percent do dispose up to an half their produce per season.

About 46 percent of farmers in Tanzania do not sell any portion of their farm produce per season but more than 50 percent do dispose their produce from 5 up to more than 50 percent per season. Lack of storage facilities, post harvest management skills were among the key reasons

- **Farmers Capacity building on modern faming /agriculture**

Figure 5.10: Farmers Attendance to Modern Farming Trainings (%) in last 3 years

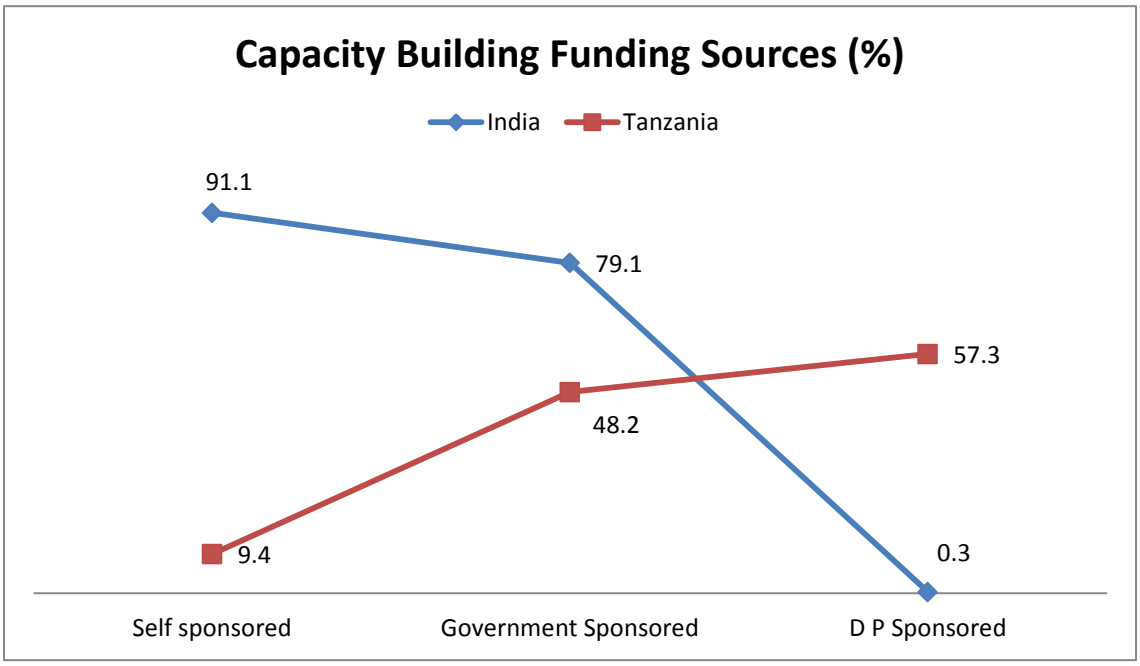


Source: Survey Data

Table 5.12: Source of sponsorship for attending training

Source of Participation Costs	India		Tanzania	
	Respondents	Percent	Respondents	Percent
Self sponsored	275	91.1	24	9.4
Government Sponsored	238	79.1	123	48.2
Development Partners Sponsored	1	0.3	146	57.3

Figure 5.11: Sources of Funds to Sponsor Farmers Capacity Building



Source: Survey Data

Interpretation

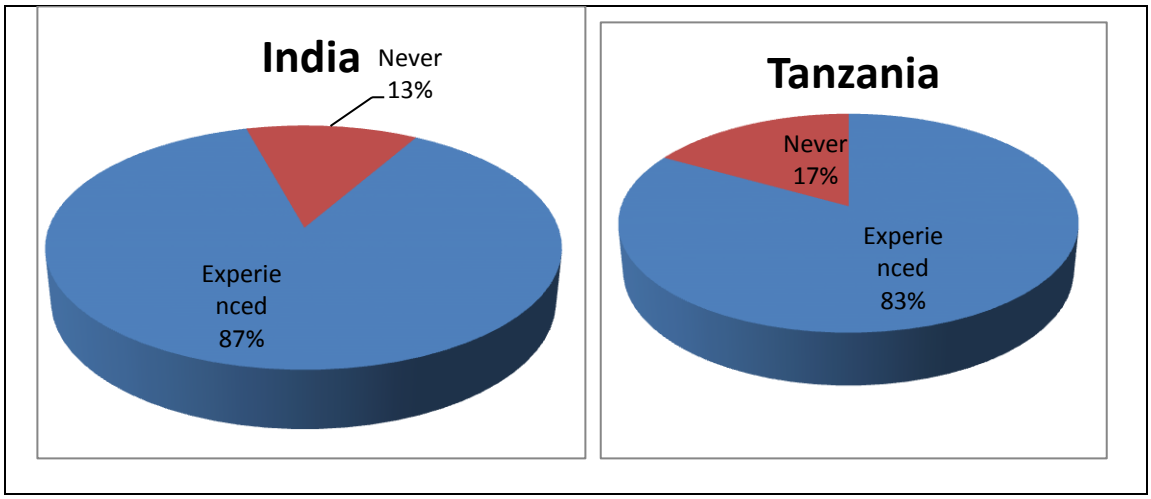
From Figure 5.9 it can be interpreted that more than half of farmers in India had ever enjoyed capacity building related to modern farming at least once while more than an half in Tanzania never got the same.

From Figure 5.11: Funding sources for such trainings in India are dominated by self sponsorship (91 percent) and government sponsorship (79 percent) respectively. In Tanzania farmers' capacity building funding sources are dominated by Development Partners sponsorship (57 percent) and the government contributes about 48 percent for the same respectively.

5.4 Difficulties faced by agricultural smallholders

- **Crop losses experienced by farmers, causes and mitigations or way used to regain their economic statuses**

Figure 5.12: Farmers who ever experienced crop losses within the last 3 Years (%)



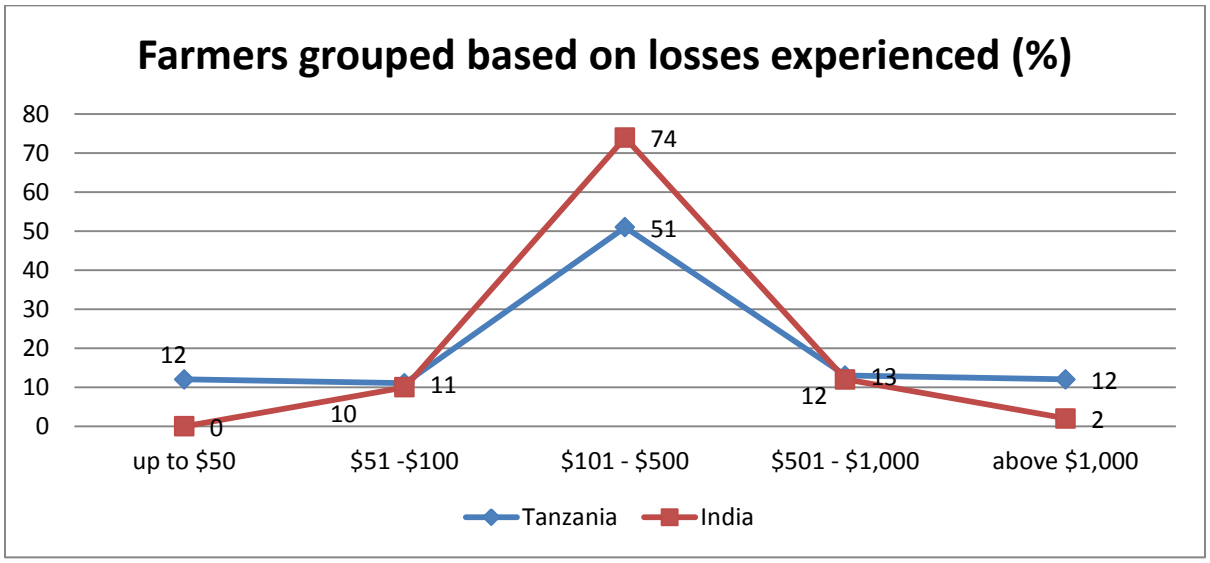
Source: Survey Data

Interpretation:

From Figure 5.12 it can be inferred that:

At least eight farmers out of ten have ever experienced crop losses at least once in a year regardless the cause(s).

Figure 5.13: Amount of crop losses experienced within the last three years



Interpretation:

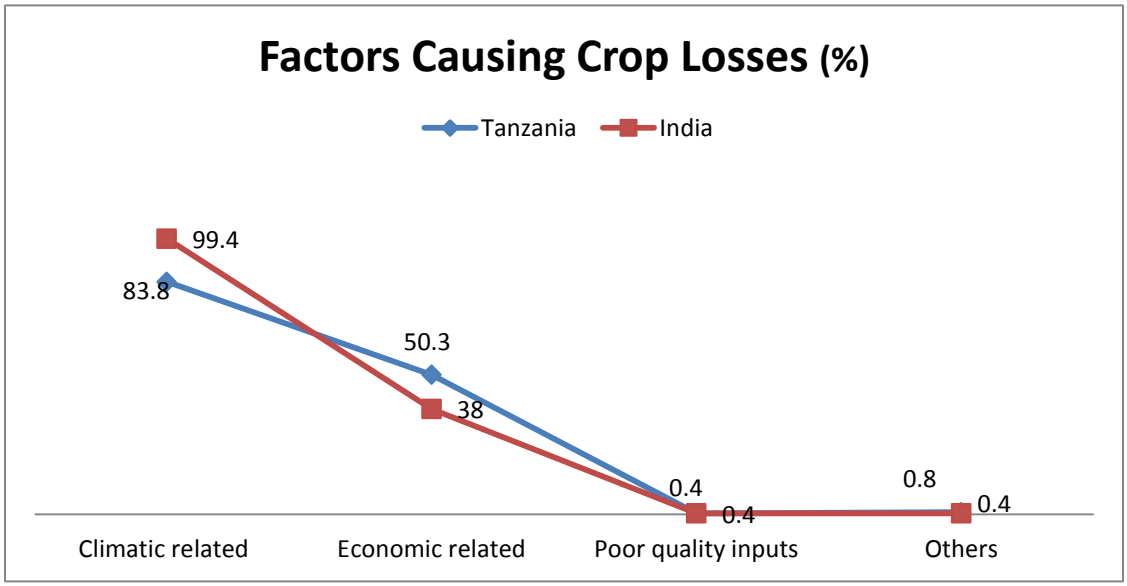
From Figure 5.13 it is interpreted that the most affected group is that of small farmers and agriprenuers whose income ranges between $100 and $500 with more than an half of respondents within both of the case study countries.

Table 5.13: Causes of crop failure

Particulars	Tanzania		India	
	Respondents	Percent	Respondents	Percent
Climatic related	410	83.8	517	99.4
Economic related	245	50.3	199	38
Poor quality inputs	2	0.4	2	0.4
Others	4	0.8	2	0.4

Source: Survey Data

Figure 5.14: Farmers grouped according to causes of crop failure in last 3 years



Source: Survey Data

Interpretation:

From Figure 5.14 it is interpreted that climatic factors have dominated the situation. At least eight out of ten farmers within both of the case study countries ever encountered it. This means majority of farmers within the case study countries depend on uncertain

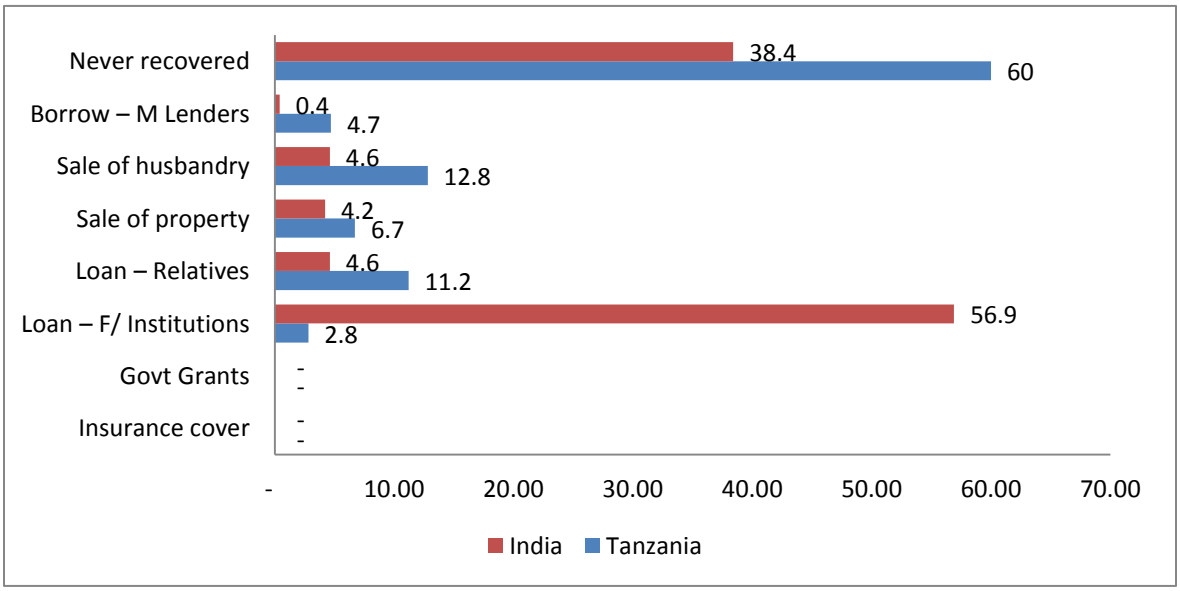
rain fed farming of which are unable to control the climatic changes such as long time rains resulting into floods and long period sunny accompanied with droughts

Economic factors were related to financial inability to: afford adequate quantity of fertilizers, appropriate farming tools, storage material, pesticides, transportation and marketing. Therefore, agriculture activities within both countries are highly stalled by climatic and economic factors.

Table 5:14: Means of recovery to normal economic condition after getting losses

Particulars	Tanzania		India	
	Respondents	Percent	Respondents	Percent
Insurance cover	0	0	0	0
Government grants	0	0	0	0
Loan – Financial Institutions	14	2.8	294	56.9
Loan – individual relatives	55	11.2	24	4.6
Sale of property	33	6.7	22	4.2
Sale of husbandry	63	12.8	24	4.6
Borrow – Money Lenders	23	4.7	2	0.4
Never recovered	294	60	119	38.4

Figure 5.15: Farmers grouped according to ways of regain to their normal economic statuses after getting losses (%)



Interpretations

Neither of the farmers in both countries within the surveyed areas ever enjoyed agriculture insurance nor government subventions as a risk transfer.

At least five farmers out of ten in India could secure loans from financial institutions (Special Agricultural Banks) to finance their farming, the service which very was limited for Tanzanian farmers at less than 5 percent.

At least one farmer out of ten in India could seek loan from relatives and/or sell part of the husbandry for assisting him to revert to his original economic status respectively. In Tanzania the portion of those who seek soft loan from relatives and/or sale their husbandry was very minor (about 4.6 percent) respectively.

While at least 3 farmers out of ten of those involved in agricultural losses in India could not regain their normal economical status, In Tanzania it is even doubled. They decide to changes into different other issues like sole trading, casual labor, sale and/or lease of their pieces of land.

5.5 Cross Tabulation – test of availability of basic services and farmers' satisfaction level

- **Government support on land survey and acquisition**

Table 5.15: Availability of Government support on land survey and acquisition to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	601	100	0	0
No	0	0	601	100
Total	601	100	601	100

Table 5.16: Level of farmers Satisfaction of land survey and acquisition

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	106	17.6	2	0.3	2	0.3	487	81	4	0.7

Interpretations

From table 5.15 The Tanzanian government does not provide any assistance on land survey and acquisition to their farmers. This means farmers are exposed to a total risk of losing their pieces of land due to lack of documents to verify their ownership. To the contrary, all farmers in India confessed availability of such service from their government.

However, not all farmers were satisfied by such service. About 81 percent indicated to have been satisfied leaving about 17.6 being totally dissatisfied.

- **Government support on Inputs - Seeds & Agrochemicals**

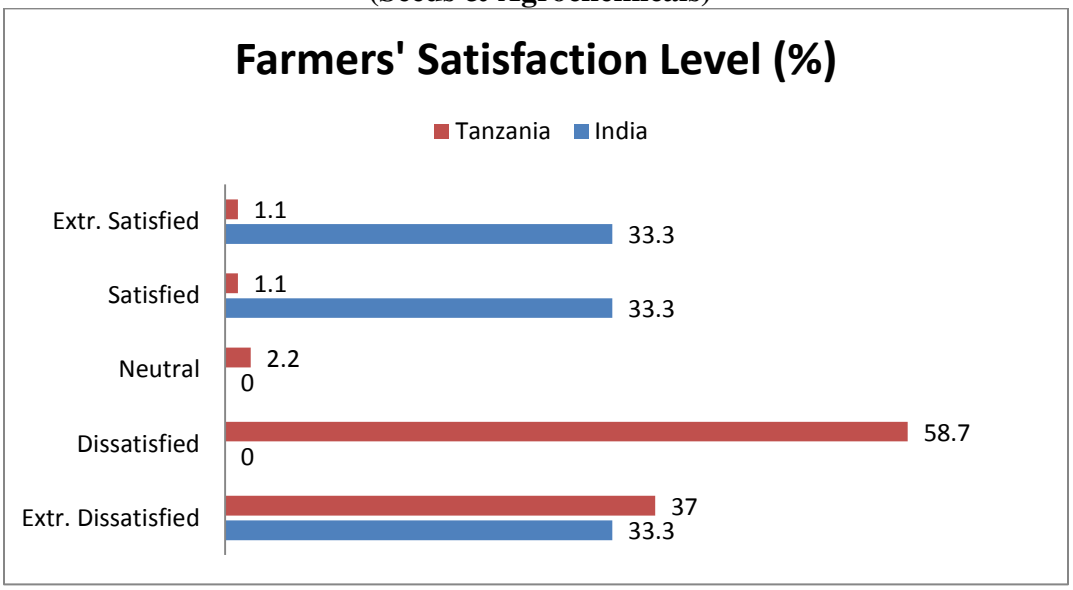
Table 5.17: Availability of Government support on inputs seeds & agrochemicals to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	6	1	92	15.3
No	595	99	509	84.7
Total	601	100	601	100

Table 5.18: Farmers Satisfaction on Government on Inputs seeds & Agrochemicals

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	2	33.3	0	0	0	0	2	33.3	2	33.3
Tanzania	34	37	54	58.7	2	2.2	1	1.1	1	1.1

Figure 5.16: Farmers' Level of Satisfaction with Government Support on Inputs (Seeds & Agrochemicals)



Interpretations

From Table 5.17 it is interpreted that the government support on inputs - seeds and agrochemicals to farmers is almost negligible within both of the case study countries with less than 20 percent. The situation is even worse in India with only 1 percent.

From Figure 5.16 among those who confessed availability of such service, more than 90 percent in Tanzania are dissatisfied compared to 33 percent of India. In other words, more than 65 percent farmers were satisfied.

- **Government provision of agricultural subsidies**

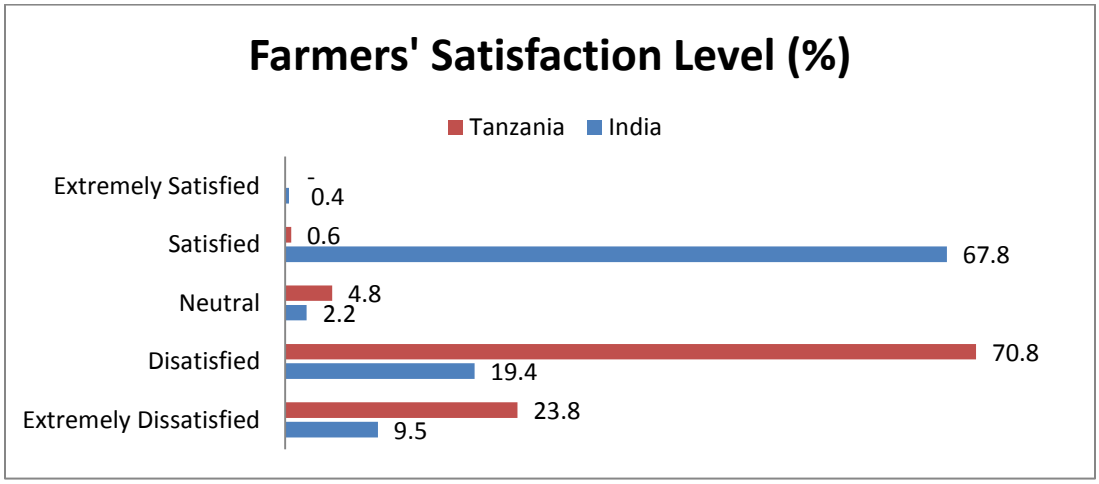
Table 5.19: Availability of Government support on agricultural subsidies to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	453	75.4	484	80.5
No	148	24.6	117	19.5
Total	601	100	601	100

Table 5.20: Farmers Satisfaction on agricultural subsidies

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	43	9.5	88	19.4	10	2.2	307	67.8	2	0.4
Tanzania	115	23.8	342	70.8	23	4.8	3	0.6	0	0

Figure 5.17: Level of farmers Satisfaction on Government provision of agricultural subsidies



Interpretation

From table 5.19 it can be interpreted that at least 7 farmers out of ten in India have ever enjoyed the government support on agricultural subsidies to farmers, while in Tanzania, about 8 farmers out of ten have confessed the same. From Figure 5.17 more than 67 percent of farmers were satisfied with such service compared to less than1 percent of Tanzanian farmers. More than 70 percent of farmers in Tanzania were unhappy with the service compared to about 19 percent of Indian farmers. This means the Tanzanian government support to farmers on agricultural subsidies is too nominal and/or political.

- **Government support on Electricity**

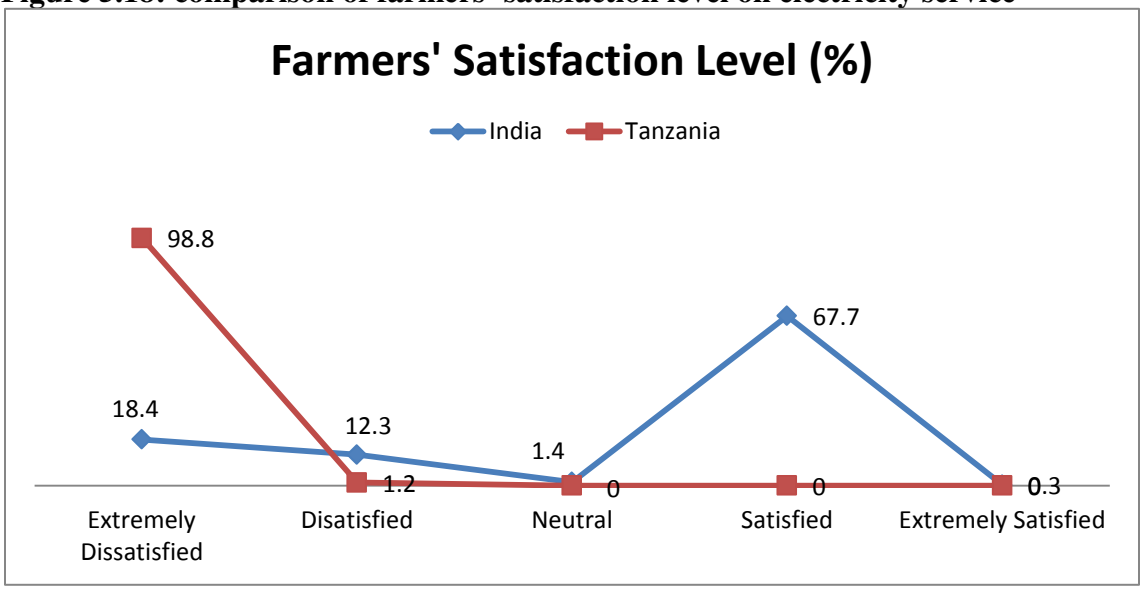
Table 5.21: Availability of Government support on Electricity to farmers

Particulars	India		Tanzania	
	Farmers	Percent	Farmers	Percent
Yes	587	97.7	82	13.6
No	14	2.3	519	86.4
Total	601	100	601	100

Table 5.22: Farmers Satisfaction on Electricity service

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	108	18.4	72	12.3	8	1.4	397	67.7	2	0.3
Tanzania	81	98.8	1	1.2	0	0	0	0	0	0

Figure 5.18: comparison of farmers' satisfaction level on electricity service



Source: Survey Data

Interpretation

From Table 5.21 it can be interpreted that the government provision of electricity service is in a converse relationship. While about 9 out of ten Indian farmers ever enjoyed the service, in Tanzania about 8 out of ten farmers never enjoyed the same.

From Figure 5.18 More than 98 percent of farmers in Tanzania were extremely unhappy with the service compared to about 18 percent of Indian farmers. More than 67 percent of Indian farmers were happy with the service. This means the Tanzanian farmers are highly exposed to agricultural risks caused by lack electricity such as high

irrigation costs, lack of storage and pre cooling facilities, sale of unprocessed farm produce.

- **Government support on Mechanization**

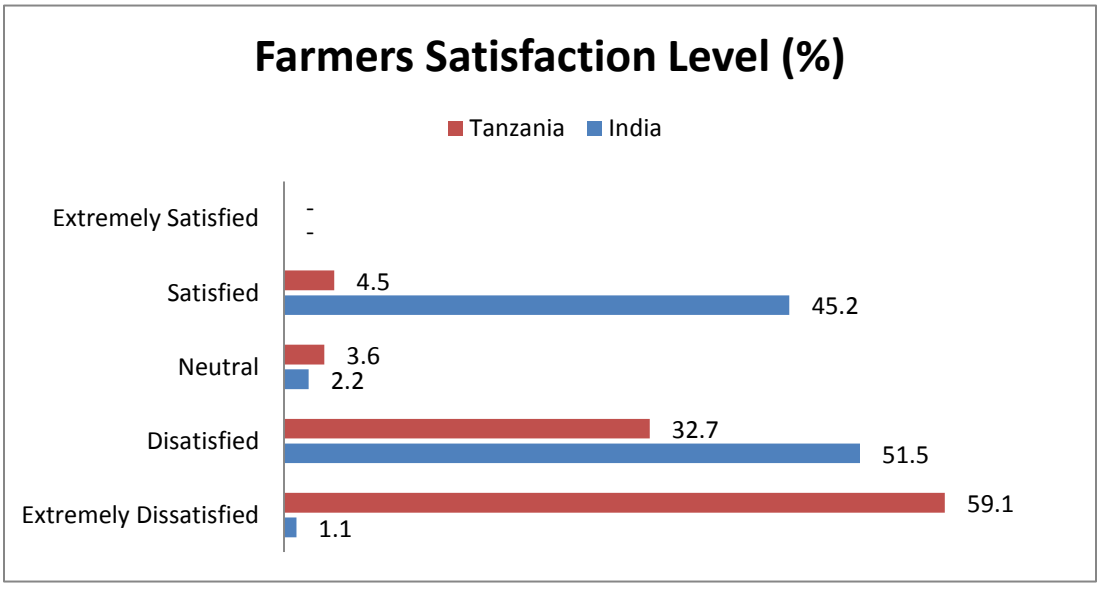
Table 5.23: Availability of Government support on Mechanization to farmers

Particulars	India		Tanzania	
	Farmers	Percent	Farmers	Percent
Yes	361	60.1	220	36.6
No	240	39.9	381	63.4
Total	601	100	601	100

Table 5.24: Farmers Satisfaction with government support on mechanization

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	4	1.1	186	51.5	8	2.2	163	45.2	0	0
Tanzania	130	59.1	72	32.7	8	3.6	10	4.5	0	0

Figure 5.19: Level of farmers Satisfaction on Government support on Mechanization



Interpretation

From Table 5.23 it can be interpreted that the government support on agriculture mechanization is twice as much in India at 60 percent compared to Tanzania at 36 percent respectively.

From Figure 5.19 More than 90 percent of farmers in Tanzania were unhappy with the service compared to about 53 percent of Indian farmers. More than 45 percent of Indian farmers were happy with the service compared to less than 5 percent in Tanzania. This means the Tanzanian farmers are highly exposed to use of hand hoe in their farming activities.

- **Government support on Irrigation**

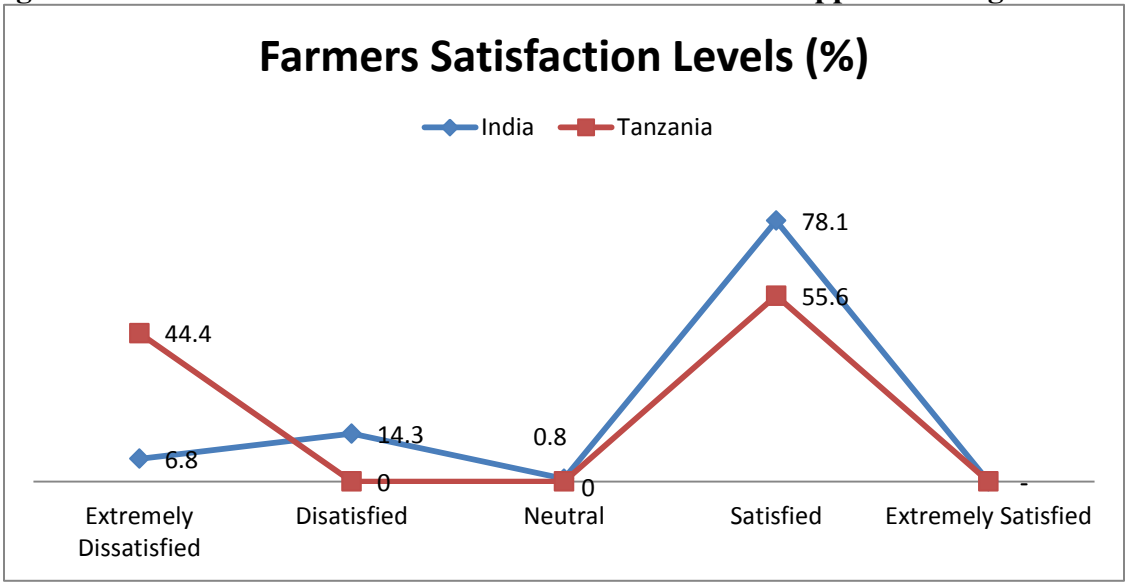
Table 5.25: Availability of Government support on input Irrigation to farmers

Particulars	India		Tanzania	
	Farmers	Percent	Farmers	Percent
Yes	503	83.7	54	9
No	98	16.3	547	91
Total	601	100	601	100

Table 5.26: Farmers Satisfaction on input Irrigation

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	34	6.8	72	14.3	4	0.8	393	78.1	0	0
Tanzania	24	44.4	0	0	0	0	30	55.6	0	0

Figure 5.20: Level of farmers Satisfaction on Government support on irrigation



Source: Survey data

Interpretation

From Table 5.25 it can be interpreted that the government support on irrigation is nine times as much in India at 83 percent compared to Tanzania at 9 percent respectively. This means the Tanzania government has a great potential of improving their agricultural productivity by investing more in irrigation farming.

From Figure 5.20 More than 55 percent of farmers in Tanzania who receive the service were happy with it compared to about 78 percent of Indian farmers leaving about 44 percent of Tanzanian farmers extremely unhappy with the service compared to less than 7 percent in India respectively.

- **Government support on crop loan**

Table 5.27: Availability of Government support on input Irrigation to farmers

Particulars	India		Tanzania	
	Farmers	Percent	Farmers	Percent
Yes	391	65.1	0	0
No	210	34.9	601	100
Total	601	100	601	100

Table 5.28: Farmers Satisfaction on input crop loan

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	0	0	2	0.7	4	1.3	299	98	0	0

Interpretation

From Table 5.27 it implies that the Tanzanian government does not provide any crop loan to their farmers. This means they are highly exposed into the risk of routine crops cultivation failure and/or subsistence farming only to due to lack of modern farming facilities. To the contrary, at least 65 percent of farmers in India are enjoying the service from the government. And from Table 5.27 more than 98 percent are satisfied with that service. On the other hand, the possibility of an Indian farmer to skip farming just because of lack of necessary equipment is less than 2 percent while Tanzania government has a great potential of improving their agricultural productivity by providing such important service to their farmers respectively.

- **Government support on crop and/or agriculture insurance**

Table 5.29: Availability of Government support on crop/agriculture insurance to farmers

Particulars	India		Tanzania	
	Farmers	Percent	Farmers	Percent
Yes	11	1.8	0	0
No	590	98.2	601	100
Total	601	100	601	100

Table 5.30: Farmers Satisfaction on crop/agriculture insurance

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	1	9.1	0	0	2	18.2	8	72.7	0	0

Interpretation

From Table 5.29 it implies that the Tanzanian government does not provide any crop or agriculture insurance to their farmers, and less than 2 percent of Indian famers ever enjoyed the service. This means almost all farmers within both countries are highly exposed to total loss in the instance of natural calamities or any other issue beyond their prediction. On the other hand, the government information about agriculture insurance in India are too nominal and/or political if such service has not been there for some special group of agricultural stakeholders. The satisfaction level of those getting the service in India was as high as more than 72 percent. This means that there is a potential opportunity to improve farmers' economy through agricultural insurance.

- **Government support on Horticulture Promotion**

Table 5.31: Availability of Government support on input horticulture promotion to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	296	49.3	0	0
No	305	50.7	601	100
Total	601	100	601	100

Table 5.32: Farmers Satisfaction on Horticulture Promotion

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	0	0	98	34.9	8	2.8	175	62.3	0	0

Interpretation

From Table 5.31 it can be interpreted that at least four farmers out of ten in India ever enjoyed the government support on the horticulture promotion while neither of Tanzanian farmers ever enjoyed any crop or agriculture. This implies that horticulture in Tanzania is currently conducted on self initiatives of individual farmers.

Horticulture is among the agriculture aspects with high rate of challenges due to the demand of different facilities for its conduction such as pre cooling and pre processing facilities; storage, transport and distribution facilities. This implies that the possibility of a Tanzanian horticulture farmer's failure due to lack of these facilities is very high. Among those who were receiving such service in India, more than 60 percent were satisfied as it can be observed from Table 5.32 meaning that the possibility of improving the farmer's economy through horticulture is very high.

- **Government support on Warehousing services**

Table 5.33: Availability of Government support on warehouse services to farmers

Particulars	India		Tanzania	
	Farmers	Percent	Farmers	Percent
Yes	392	65.2	121	20.1
No	209	34.8	480	79.9
Total	601	100	601	100

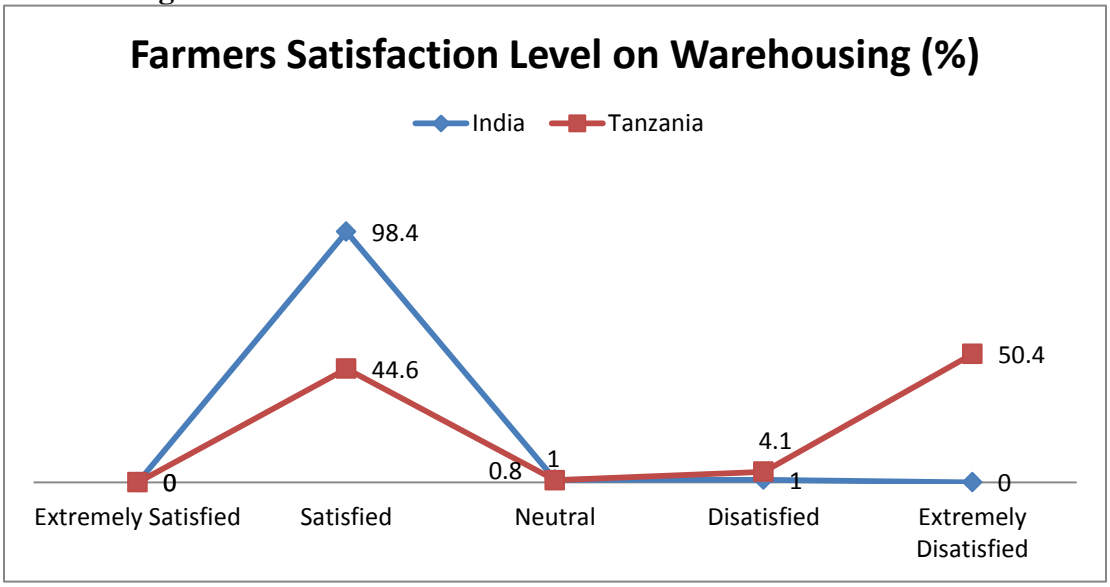
Source: Survey data

Table 5.34: Farmers Satisfaction on warehousing services

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	0	0	4	1	4	1	384	98.4	0	0
Tanzania	61	50.4	5	4.1	1	0.8	54	44.6	0	0

Source: Survey data

Figure 5.21: Level of farmers Satisfaction with Government support on warehousing services



Source: Survey data

Interpretation

From Table 5.33 it can be interpreted that the availability of the warehousing services to farmers in India is three times as much as in Tanzania meaning that to every ten Indian farmers six of them had ever enjoyed such service compared to two farmers out of every ten Tanzania farmers who confessed to have ever enjoyed the same.

From Figure 5.21 almost all (98 percent) of Indian farmers receiving the warehousing service were happy with it compared with only 44.6 percent of Tanzanian farmers who confessed the same. On the other hand more than 50 percent of Tanzanian farmers who ever received such service were extremely unhappy with it. This means that the warehousing service provided by the Tanzanian government is too nominal or political than the actual demand by the respective stakeholders.

- **Government support on Postharvest Losses Management**

Table 5.35: Availability of Government support on PHL Management to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	395	65.7	61	10.1
No	206	34.3	540	89.9
Total	601	100	601	100

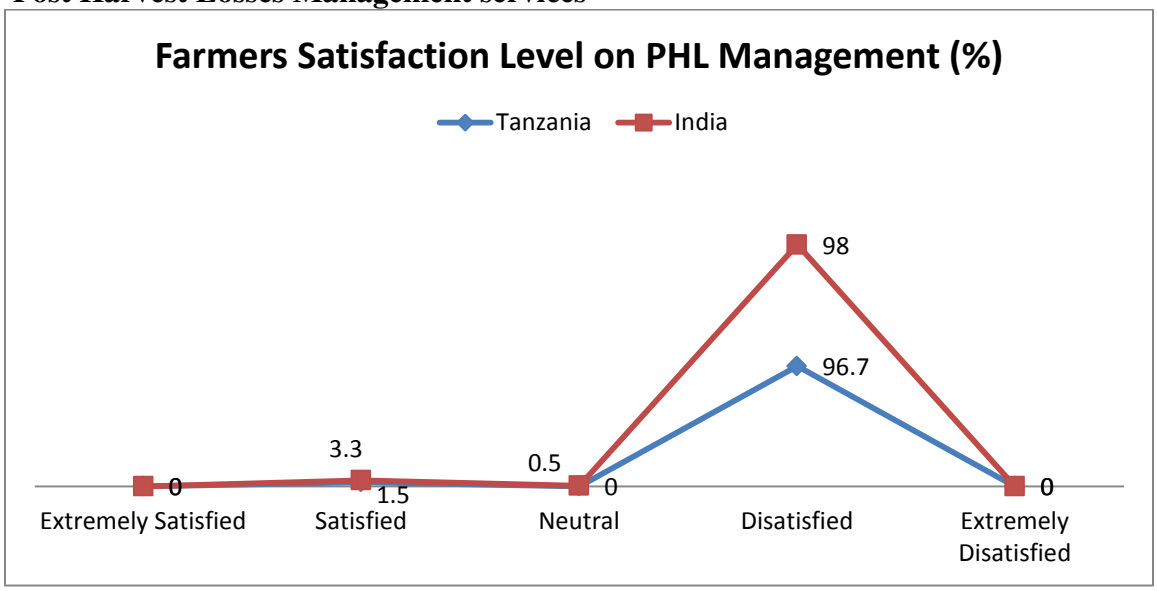
Source: Survey data

Table 5.36: Farmers Satisfaction on Postharvest Losses Management

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	0	0	6	1.5	2	0.5	387	98.0	0	0
Tanzania	0	0	2	3.3	0	0	59	96.7	0	0

Source: Survey data

Figure 5.22: Comparison of farmers' satisfaction levels with government support on Post Harvest Losses Management services



Source: Survey data

Interpretation

From Table 5.35 it can be interpreted that the availability of the post harvest losses management services to farmers in India is more than six times as much as in Tanzania. It

means that to every ten Indian farmers six of them had ever enjoyed such service compared to one farmer out of every ten Tanzania farmers who confessed to have ever enjoyed the same.

However, from Figure 5.22 such government support on post harvest losses management to farmers does not consider farmers actual demand. Almost all respondents within both countries were unhappy with it at 98 and 96.7 percent in India and Tanzania respectively. Only 3.3 and 1.5 percent of respondents within India and Tanzania respectively confessed to have been happy with such service.

- **Government support on Farm produce Processing and value addition**

Table 5.37: Availability of Government support on farm produce processing and value addition to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	0	0	0	0
No	601	100	601	100
Total	601	100	601	100

Source: Survey data

Interpretation

From Table 5.37 it is interpreted that both governments do not provide support on farm produce processing and value addition to their farmers.

This means smallholders of agriculture are highly exposed to the risk of distress sales of their farm produce instantly during or after harvest season, in law form and at non remunerative prices due to lack of adequate technologies and facilities for post harvest handling, storage and processing but later to buy the commodities at much higher prices.

This situation has effects to smallholders of agriculture in two tires: (i) reducing their income from sale of their farm produce; and (ii) dragging most of their resources for purchasing food and other commodities from the market at very high prices.

- **Government support on transport infrastructure**

Table 5.38: Availability of Government support on transport infrastructure to farmers

Particulars	India		Tanzania	
	Farmers	Percent	Farmers	Percent
Yes	561	93.4	504	83.9
No	40	6.6	97	16.1
Total	601	100	601	100

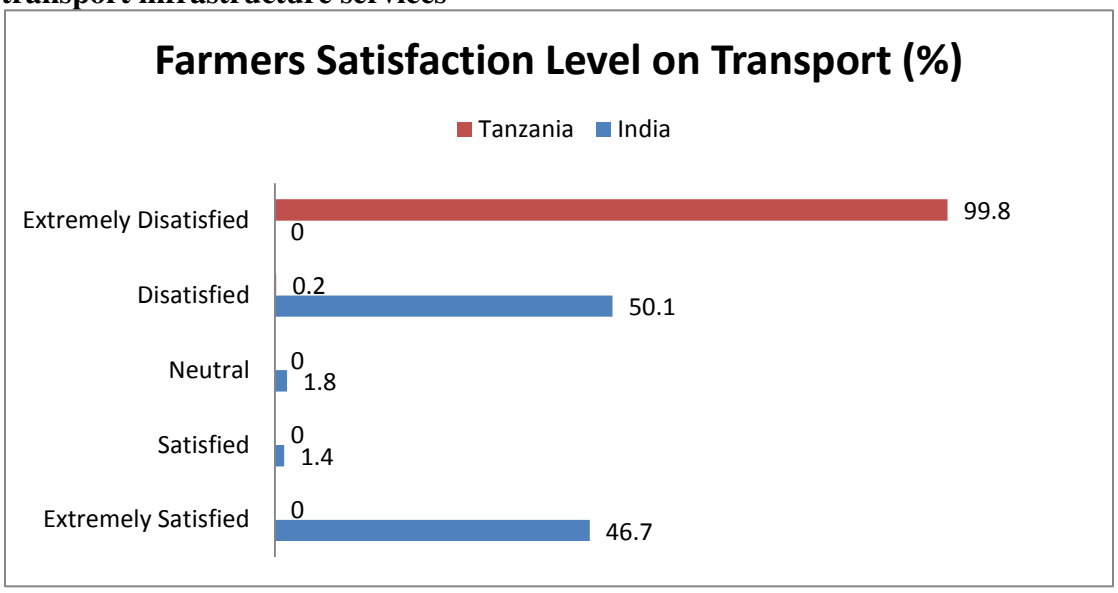
Source: Survey data

Table 5.39: Farmers Satisfaction on transport infrastructure

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	262	46.7	8	1.4	10	1.8	281	50.1	0	0
Tanzania	503	99.8	1	0.2	0	0	0	0	0	0

Source: Survey data

Figure 5.23: Comparison of farmers' satisfaction levels with government support on transport infrastructure services



Source: Survey data

Interpretation

From Table 5.38 it is interpreted that transport infrastructure is available at a level of 93.4 and 83.9 percent for India and Tanzania respectively.

However, based on Figure 5.23 it can be interpreted that almost all (99.8 percent) of Tanzanian respondents who confessed availability of such service were extremely unhappy with it. In India about 46 percent confessed to have been enjoying the service leaving more than 50 percent of the respondents being unhappy with the service.

The most reason for such situation was poor accessibility of farm or feeder roads (known as Pucca in India) to respective farm yards throughout the year. During rainy or (monsoon in India) season most of the roads becomes inaccessible leading to farmers' tractors get capped into the extremely wet mud.

This situation also has effects to farmers not only delaying farming activities but also leading to additional repair and maintenance expenses and limited access of farmers to the market of their respective farm produce.

- **Government support on marketing infrastructure**

Table 5.40: Availability of Government support on marketing infrastructure to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	195	32.5	0	0
No	406	67.5	601	100
Total	601	100	601	100

Source: Survey data

Table 5.41: Farmers Satisfaction on marketing infrastructure

Country	Extremely Dissatisfied		Dissatisfied		Neutral		Satisfied		Extremely Satisfied	
	No.	%	No.	%	No.	%	No.	%	No.	%
India	0	0	0	0	0	0	195	100	0	0

Source: Survey data

Interpretation

From Table 5.40 it is interpreted that the government of Tanzania does not provide support on marketing infrastructure services to their farmers. This means Tanzanian smallholders of agriculture are highly exposed to the risk individual fraudulent and/or unfaithfully middlemen who are always there just to take advantage of farmers' sweat. On the other hand, in India to every ten farmers at least three of them had ever enjoyed the marketing infrastructure services within their respective local or nearby areas.

From Table 5.41 all respondents who confessed availability of Government support on marketing infrastructure within their respective local or nearby areas in India have indicated to have been enjoying the service. This has an interpretation of a high potentiality of improving the economy of smallholders of agriculture through availability of reliable marketing infrastructure for their farm produce within the respective study countries.

- **Government support on special agriculture banking and credits**

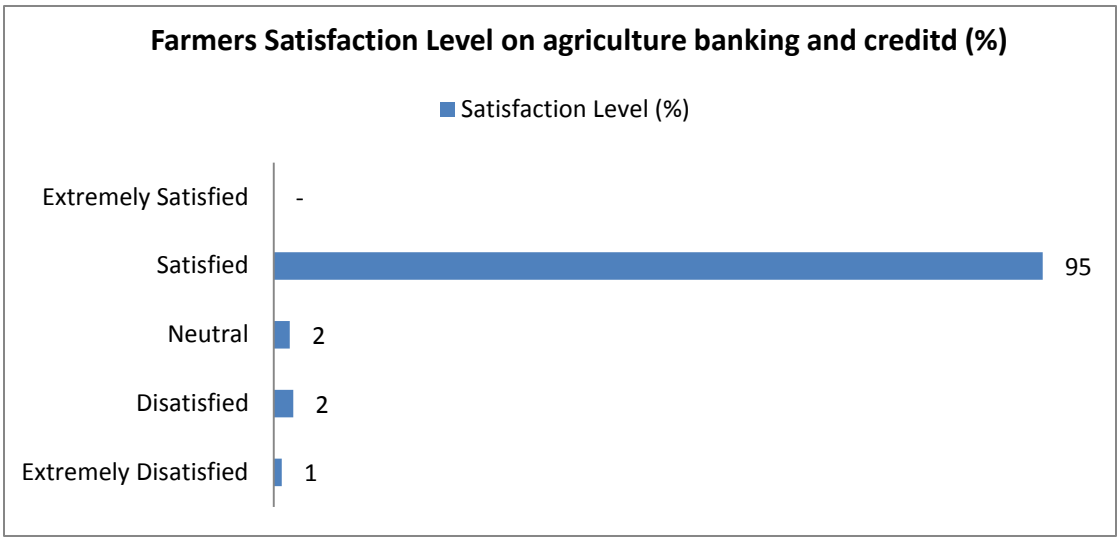
Table 5.42: Availability of Government support on special agriculture banking and credits to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	409	68.1	0	0
No	192	31.9	601	100
Total	601	100	601	100

Source: Survey data

Figure 5.24: Comparison of farmers' satisfaction levels with government support on special agriculture banking and credit services in India

Source: Survey data



Interpretation

From Table 5.42 it is interpreted that the government of Tanzania does not provide support on special agriculture banking and credits services to their farmers. This means that the financing of the agriculture for a Tanzanian smallholder is subject to self individual efforts to seek financial credits from unreliable individual money lenders, creditors and private commercial banks and institutions most of which do not accept them because of their nature (termed as high risk borrowers) but also the interest rates charged by these institutions are always high which cannot be afforded by majority smallholders.

On the other hand, more than 68 percent of respondents in India confessed to have ever received the service. This means that to every ten Indian farmers at least six had ever enjoyed special agriculture banking and credits services.

From Figure 5.24 more than 95 percent of respondents who confessed availability of government support on special agriculture banking and credit within their respective local or nearby areas in India have indicated to have been happy with the service. This has an interpretation of a high potentiality for both Indian and Tanzanian governments to

improving the economy of smallholders of agriculture through provision of special agriculture banking and credit respectively.

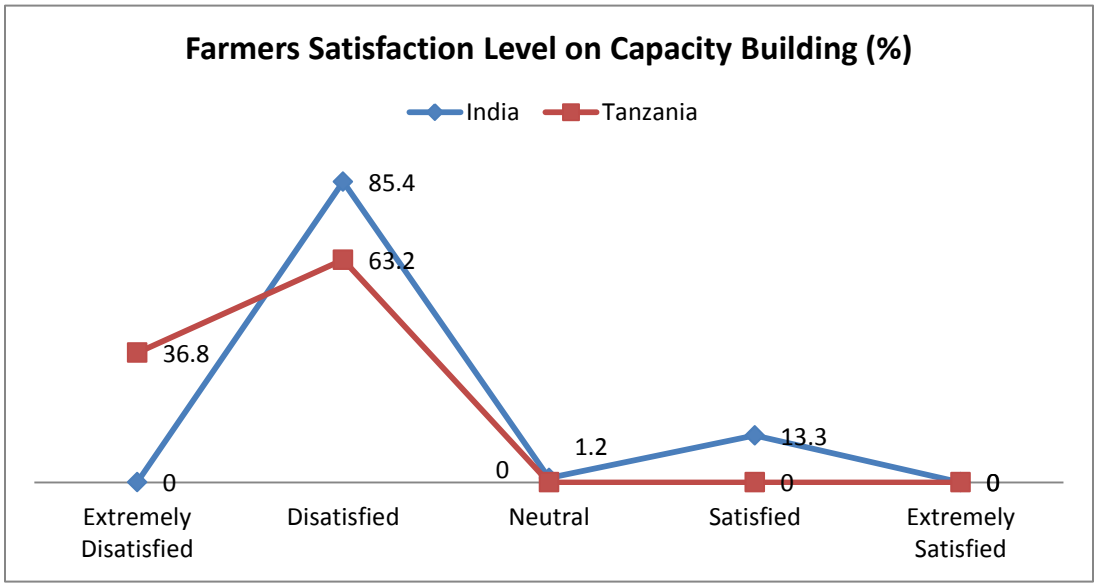
- **Government support on capacity building**

Table 5.43: Availability of government support on capacity building to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	240	39.9	270	44.9
No	361	60.1	331	55.1
Total	601	100	601	100

Source: Survey Data

Figure 5.25: Comparison of farmers' satisfaction levels with government support on capacity building services in India and Tanzania



Source: Survey Data

Interpretation

From Table 5.43 it is interpreted that both governments of India and Tanzania do provide support on capacity building to their farmers respectively. However, the current magnitude of stakeholders covered by such service does not suffice the demand of majority because the potion of respondents covered by such service was as less as 39.9 and 44.9 percent for India and Tanzania respectively.

Further, as it can be seen in Figure 5.25 majority among those a few who confessed to have ever received such service indicated to have been unhappy with it. In India more than 85 percent were dissatisfied leaving only 13.3 percent who reported to have been enjoying the same. Neither of the Tanzanian respondents who confessed to have ever received such service was happy with the service. More than 63 percent indicated to have been dissatisfied while about 36.8 percent indicated to have been tremendously dissatisfied by the same.

- **Government support on export facilities**

Table 5.44: Availability of Government support on export facilities to farmers

Particulars	India		Tanzania	
	Farmers	Percent	Farmers	Percent
Yes	2	0.3	0	0
No	599	99.7	601	100
Total	**601**	**100**	**601**	**100**

Source: Survey Data

Interpretation

From Table 5.44 it is interpreted that both governments do not provide support on farm produce exportation to their farmers. Neither of the Tanzanian respondents ever enjoyed such service, while only less than one percent respondents in India confessed to have ever enjoyed the same.

This can further be interpreted that majority of smallholders of agriculture within the case study countries are either practicing subsistence farming meaning that they have nothing to export or they have been marginalized by their respective governments.

However it was realized that majority of smallholders were restrained by both - illiteracy on marketing and exporting their farm produce to the market due to lack of perfect information relevant to their produce; price changes, the entire process of exportation and limited permits to sell their products in areas where there are markets but outside of the

area they operated from due to government bans from selling their farm produce out of their local areas.

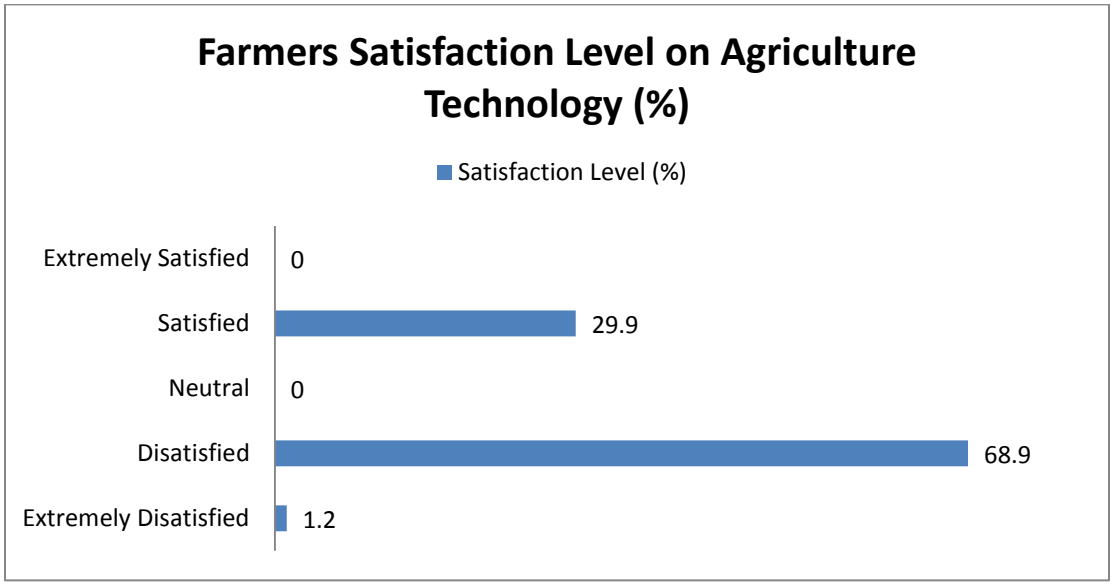
- **Government support on agriculture technology**

Table 5.45: Availability of Government support on agriculture technology to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	241	40.1	0	0
No	360	59.9	601	100
Total	601	100	601	100

Source: Survey Data

Figure 5.26: Test of farmers' satisfaction levels with government support on agriculture technology in India



Source: Survey Data

Interpretation

From Table 5.45 it is interpreted that the government of Tanzania does not provide support on agriculture technology services to their farmers. This means that modern agriculture for a Tanzanian smallholder is subject to self individual efforts to seek consultancy and advanced farming equipments from private institutions most of which are

profit oriented the situation which restrain majority of them to indigenous farming hence persistence of low agricultural productivity.

On the other hand, more than 40 percent of respondents in India confessed to have ever received the service. This means that to every ten Indian farmers at least four had ever enjoyed government support on advanced agriculture technology services.

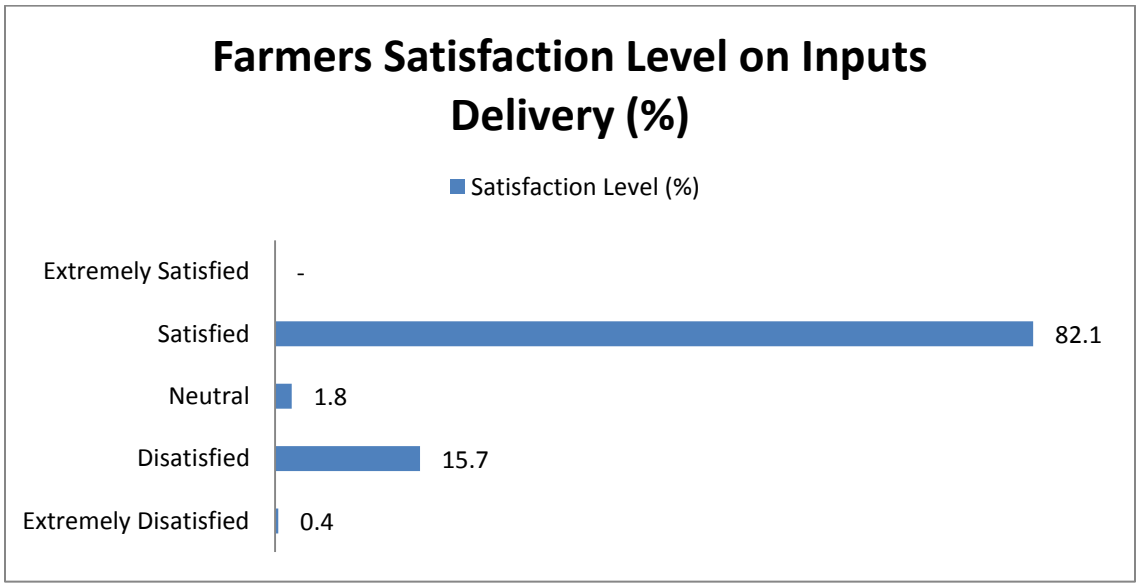
From Figure 5.26 more than an half (68 percent) of respondents who confessed availability of government support on advanced agriculture technology services within their respective local areas in India were unhappy with the service leaving only less than 30 percent who confessed to have been enjoying the service. This has an interpretation of non consideration of stakeholders' demand with respect to their agricultural daily dealings. Further, both Indian and Tanzanian governments have a great potential of improving the economy of smallholders of agriculture through provision of appropriate advanced agriculture technology services to their stakeholders respectively.

- **Government support on timely delivery of agriculture inputs**

Table 5.46: Availability of Government support on timely delivery of agriculture inputs to farmers

Particulars	India		Tanzania	
	Farmers	Percent	Farmers	Percent
Yes	274	45.6	0	0
No	327	54.4	601	100
Total	601	100	601	100

Figure 5.27: Test of Farmers Satisfaction on timely delivery of agriculture inputs in India



Source: Survey Data

Interpretation

From Table 5.46 it can be interpreted that the government of Tanzania is not concerned with timely delivery of agricultural inputs (particularly seeds) to their farmers. Seeds were always being delivered late during weeding period the situation that made them useless. This means that a Tanzanian smallholder of agriculture has been exposed to the risk of using low yielding seeds which they have been acquiring from informal sources among themselves and or uncertified farm implements distributers the situation that has restrained most of them from achieving their targeted objectives of improving their agriculture productivity.

On the other hand, more than 45 percent of respondents in India confessed to have ever received the service. This means that to every ten Indian farmers at least four had ever enjoyed government support on timely delivery of agriculture inputs (seeds) services.

From Figure 5.27 more than two-third (82 percent) of respondents who confessed availability of government support on timely delivery of agriculture inputs (seeds) services

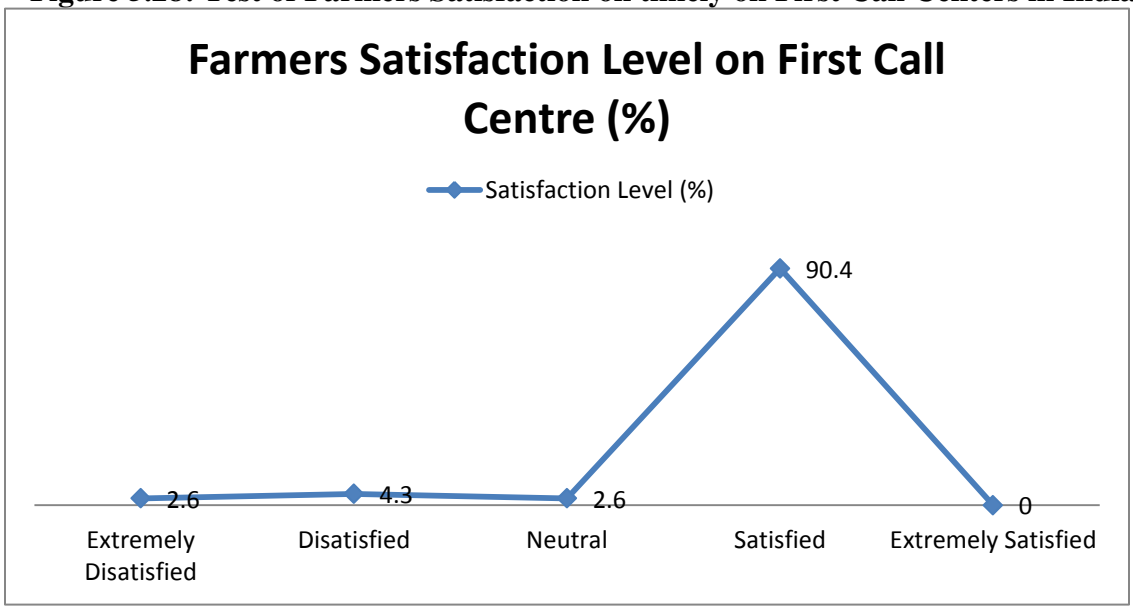
within their respective local areas in India during sowing seasons were enjoying the service leaving only about 16 percent who confessed to have been unhappy with the service. This has an interpretation of high potentiality of both Indian and Tanzanian governments to improving stakeholders' productivity on agriculture upon timely delivery of certified high yielding seeds respectively.

- **Government support on First Call Centers**

Table 5.47: Availability of Government support on First Call Centers to farmers

Particulars	India		Tanzania	
	No. Farmers	Percent	No. Farmers	Percent
Yes	115	19.1	0	0
No	486	80.9	601	100
Total	601	100	601	100

Figure 5.28: Test of Farmers Satisfaction on timely on First Call Centers in India



Source: Survey Data

Interpretation

From Table 5.47 it is interpreted that the government of Tanzania does not provide support on first call center or kiosk services to their farmers. First Call Centers are

schemes full financed by governments in most countries to where farmers do dial the toll-free numbers and get their queries answered by the respective expertise. This means farmer's queries (except those complex one that need physical appearance of an expert) are solved while he is at his farm yard proceeding with production activities and the expert in his office serving many others. To the contrary, all Tanzanian smallholders of agriculture are subjected to pay a physical visit to the respective offices which are always afar from their local residence or to wait until the respective extension officer make a normal visit to his area which do not happen regularly.

On the other hand, less than 20 percent of respondents in India confessed to have ever received the service. This means that more than 80 percent of Indian smallholder farmers are also subjected to a situation like that of Tanzanians to pay a physical visit to the respective offices which are always afar from their local residence or to wait until the respective extension officer make a normal visit to his area which do not happen regularly.

From Figure 5.28 more than 90 percent of respondents who confessed availability of government support on first call centre services in India were enjoying the service leaving only less than 7 percent who confessed to have been unhappy with the service.

This has an interpretation of high potential for both Indian and Tanzanian governments for improving the productivity of their farmers upon solving their queries while they are on filed enduring with production which in turn improves their economy resulting from free stress farming respectively.

5.6 Hypotheses Testing

5.6. 1 Chi Square Test

For overall objective:

The overall objective was tested under different sub-hypotheses using some aspects that were considered as the key elements for the sector growth through public investment as follows

Sub-Hypothesis

H0: There is no relationship between land size and per ha consumption of fertilizers.

H1: The per ha consumption of fertilizers is dependent to land size.

Table 5.48: Chi Square Test: Relationships between land size and per ha consumption of fertilizers in Tanzania and India

	Tanzania			India		
	Value	Df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.702	15	.041	68.691	15	.000
Likelihood Ratio	25.751	15	.041	61.945	15	.000
Linear-by-Linear Association	1.315	1	.251	21.599	1	.000
N of Valid Cases	601			601		

Interpretation

From Table 5.48 the significant values are 0.041 and 0.000 for Tanzania and India respectively both of which are less than 0.05. Therefore the null hypothesis fails to be accepted. This means the larger the land size, the higher the rate of per ha consumption of fertilizers, hence high agricultural productivity in both countries respectively.

Sub-Hypothesis

H0: The use of hand hoe is independent to accessibility rather than land size and desire

H1: The use of hand hoe is dependent to accessibility regardless the land size and desire

Table 5.49: Chi Square Test: Relationships between land size, use of hand hoe and accessibility in Tanzania and India

	Tanzania			India		
	Value	Df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.781	3	.008	2.265	3	.519
Likelihood Ratio	13.265	3	.004	3.616	3	.306
Linear-by-Linear Association	10.415	1	.001	1.927	1	.165
N of Valid Cases	601			601		

Interpretation

From Table 5.49 the significant values are 0.008 and 0.519 for Tanzania and India respectively. It is less than 0.05 for Tanzania. Therefore the null hypothesis for Tanzania fails to be accepted. But the p- value for India is higher than 0.05, therefore the null hypothesis for India fails to be rejected. This means the accessibility in Tanzania is a determinant for use of hoe while in India the use of hand hoe is dependent of land size and farmer's desire.

Sub-Hypothesis

H0: The use of plough is independent to accessibility rather than land size and desire
H1: The use of plough is dependent to accessibility regardless the land size and desire

Table 5.50: Chi Square Test: Relationships between land size use of plough and accessibility in Tanzania and India

	Tanzania			India		
	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.114	3	.000	7.554	3	.056
Likelihood Ratio	21.377	3	.000	9.359	3	.025
Linear-by-Linear Association	13.610	1	.000	.894	1	.344
N of Valid Cases	601			601		

Interpretation

From Table 5.50 the p- values are 0.000 and 0.056 for Tanzania and India respectively. It is less than 0.05 for Tanzania. Therefore the null hypothesis for Tanzania fails to be accepted. But the p- value for India is higher than 0.05, therefore the null hypothesis for India fails to be rejected. This means the land size and farmer's desire in Tanzania are not a determinants for use of plough but accessibility matters while in India the use of plough is dependent of land size and farmer's desire.

Sub-Hypothesis

H0: The use of power tiller is independent to accessibility rather than land size and desire

H1: The use of power tiller is dependent to accessibility regardless the land size and desire

Table 5.51: Chi Square Test: Relationships between land size use of power tiller and financial ability in Tanzania and India

	Tanzania			India		
	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.817	3	.005	1.351	3	.717
Likelihood Ratio	10.097	3	.018	2.421	3	.490
Linear-by-Linear Association	1.828	1	.176	.621	1	.431
N of Valid Cases	601			601		

Interpretation

From Table 5.51 the p- values are 0.005 and 0.717 for Tanzania and India respectively. It is less than 0.05 for Tanzania. Therefore the null hypothesis for Tanzania fails to be accepted. But the p- value for India is higher than 0.05, therefore the null hypothesis for India fails to be rejected. This means the land size and farmers' wish in Tanzania are not a determinant for use of power tiller but accessibility matters while in India the use of power tiller is independent to accessibility rather than land size and wish by a farmer.

Sub-Hypothesis

H0: The use of tractors is dependent to accessibility regardless the land size and desire

H1: The use of tractors is independent to accessibility rather than land size and desire

Table 5.52: Chi Square Test: Relationships between land size use of tractor and financial ability in Tanzania and India

	Tanzania			India		
	Value	Df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.634	3	.131	8.241	3	.041
Likelihood Ratio	6.023	3	.110	9.827	3	.020
Linear-by-Linear Association	.030	1	.862	.022	1	.882
N of Valid Cases	601			601		

Interpretation

From Table 5.52 the p- values are 0.131 and 0.041 for Tanzania and India respectively. It is higher than 0.05 for Tanzania. Therefore the null hypothesis for Tanzania fails to be rejected. But the p- value for India is less than 0.05; therefore the null hypothesis for India fails to be accepted. This means accessibility in Tanzania is a determinant for use tractors not land size and farmers' aspiration while in India the use of tractor is independent from accessibility rather than land size and desire of a farmer.

Sub-Hypothesis

H0: Agriculture financing is dependent on farmers own funds rather than government Grants

H1: Agriculture financing is dependent on government grants rather than farmers own Funds

Table 5.53: Chi Square Test: Farmers' source of agriculture financing costs – government grants or own funds for Tanzania

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.102	1	.750		
Continuity Correction	.010	1	.919		
Likelihood Ratio	.105	1	.746		
Fisher's Exact Test				1.000	.477
Linear-by-Linear Association	.102	1	.750		
N of Valid Cases	601				

Table 5.54: Chi Square Test: Farmers source of agriculture financing costs – government grants or own funds for India

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.909	1	.340		
Continuity Correction	.000	1	1.000		
Likelihood Ratio	1.294	1	.255		
Fisher's Exact Test				1.000	.524
Linear-by-Linear Association	.908	1	.341		
N of Valid Cases	601				

Interpretation

From Table 5.53 and 5.54 the p- values are 0.750 and 0.340 for Tanzania and India respectively. Both are higher than 0.05 therefore the null hypothesis fails to be rejected. This means the financing of daily agriculture activities is dependent on farmers own funds rather than government grants within both countries

Sub-Hypothesis

H0: Agriculture financing is dependent on loans from money lenders rather than government Grants.

H1: Agriculture financing is dependent on government grants rather than loans from money lenders

Table 5.55: Chi Square Test: Farmers source of agriculture financing costs – government grants or Money lenders for Tanzania

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.148	1	.700		
Continuity Correction	.009	1	.923		
Likelihood Ratio	.156	1	.693		
Fisher's Exact Test				1.000	.487
Linear-by-Linear Association	.148	1	.700		
N of Valid Cases	600				

Table 5.56: Chi Square Test: Farmers source of agriculture financing costs – government grants or money lenders for India

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.103	1	.294		
Continuity Correction	.002	1	.961		
Likelihood Ratio	1.487	1	.223		
Fisher's Exact Test				.476	.476
Linear-by-Linear Association	1.101	1	.294		
N of Valid Cases	601				

Interpretation

From Table 5.55 and 5.56 the p- values are 0.700 and 0.294 for Tanzania and India respectively. Both are higher than 0.05 therefore the null hypothesis fails to be rejected. This means the financing daily agriculture activities is dependent on loans from money lenders rather than government grants within both countries

Sub-hypothesis

H0: Agriculture financing is dependent on loans from banks rather than government Grants

H1: Agriculture financing is dependent on government grants rather than loans from banks.

Table 5.57: Chi Square Test: Farmers source of agriculture financing costs – government grants or loans from banks for Tanzania

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.146	1	.143		
Continuity Correction	1.369	1	.242		
Likelihood Ratio	1.849	1	.174		
Fisher's Exact Test				.144	.124
Linear-by-Linear Association	2.142	1	.143		
N of Valid Cases	601				

Table 5.58: Chi Square Test: Farmers source of agriculture financing costs – government grants or loans from banks for India

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	214.381	1	.000		
Continuity Correction	211.996	1	.000		
Likelihood Ratio	229.370	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	214.025	1	.000		
N of Valid Cases	601				

Interpretation

From Table 5.57 and 5.58 the p- values are 0.143 and 0.000 for Tanzania and India respectively. It is higher than 0.05 for Tanzania. Therefore the null hypothesis for Tanzania fails to be rejected. But the p- value for India is less than 0.05; therefore the null hypothesis for India fails to be accepted. This means the financing of daily agriculture activities in Tanzania is dependent on loans from commercial banks rather than government grants while in India it is the different.

Sub-Hypothesis

H0: Agriculture financing is dependent on government grants rather than traders loans

H1: Agriculture financing is dependent on traders' loans rather than government Grants.

Table 5.59: Chi Square Tests: Farmers source of agriculture financing costs – government grants or loans from traders for Tanzania

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.299	1	.004		
Continuity Correction	5.043	1	.025		
Likelihood Ratio	5.500	1	.019		
Fisher's Exact Test				.024	.024
Linear-by-Linear Association	8.286	1	.004		
N of Valid Cases	601				

Table 5.60 Chi Square Tests: Farmers source of agriculture financing costs – government grants or loans from traders for India

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.822	1	.177		
Continuity Correction	.410	1	.522		
Likelihood Ratio	2.590	1	.108		
Fisher's Exact Test				.500	.274
Linear-by-Linear Association	1.819	1	.177		
N of Valid Cases	601				

Interpretation

From Table 5.59 and 5.60 the p- values are 0.004 and 0.177 for Tanzania and India respectively. It is higher than 0.05 for India. Therefore the null hypothesis for India fails to be rejected. But the p- value for Tanzania is less than 0.05; therefore the null hypothesis for fails to be accepted. This means the financing of daily agriculture activities in India is dependent on government grants while in Tanzania it is the different.

- **Farmers' capacity building and sources of funding**

Sub-Hypothesis

H0: Farmers capacity building is subject to self funding rather than government funding
H1: Farmers capacity building is mainly covered by government funding

Table 5.61: Chi Square Tests: Farmers Capacity building and financing sources – own source for India

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.013	1	.908		
Continuity Correction	.000	1	1.000		
Likelihood Ratio	.013	1	.910		
Fisher's Exact Test				1.000	.615
Linear-by-Linear Association	.013	1	.908		
N of Valid Cases	312				

Table 5.62: Chi Square Tests: Farmers Capacity building and financing sources – own source for Tanzania

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.927	1	.165		
Continuity Correction	1.377	1	.241		
Likelihood Ratio	1.942	1	.163		
Fisher's Exact Test				.200	.120
Linear-by-Linear Association	1.919	1	.166		
N of Valid Cases	255				

Interpretation

From Table 5.61 and 5.62 the p- values are 0.908 and 0.165 for India and Tanzania respectively. They are all higher than 0.05. Therefore the null hypothesis for both India and Tanzania fails to be rejected. This means farmers capacity building within both countries is mainly subject to self funding rather than government funding.

Sub-Hypothesis

H0: The government plays it role on farmer's capacity building through funding

H1: The government does not play it role on farmer's capacity building through funding

Table 5.63: Chi Square Tests: Farmers Capacity building and financing sources – Government sponsored for India

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.082	1	.149		
Continuity Correction	1.107	1	.293		
Likelihood Ratio	1.799	1	.180		
Fisher's Exact Test				.231	.146
Linear-by-Linear Association	2.076	1	.150		
N of Valid Cases	311				

Table 5.64: Chi Square Tests: Farmers Capacity building and financing sources – Government sponsored for Tanzania

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.490	1	.115		
Continuity Correction	2.110	1	.146		
Likelihood Ratio	2.494	1	.114		
Fisher's Exact Test				.133	.073
Linear-by-Linear Association	2.480	1	.115		
N of Valid Cases	255				

Interpretation

From Table 5.63 and 5.64 the p- values are 0.149 and 0.115 for India and Tanzania respectively. They are all higher than 0.05. Therefore the null hypothesis for both India and Tanzania fails to be rejected. This means both governments play their role on farmer's capacity building through funding. The questions remain on what extent do they make it for the effective sector growth.

Sub-Hypothesis

H0: Farmers capacity building is dominated by DP's funding rather than government

H1: Farmers capacity building is dominated by government funding rather than DP's

Table 5.65: Chi Square Tests: Farmers Capacity building and financing sources – Development Partners sponsored for India

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	14.058	1	.000		
Continuity Correction	3.045	1	.081		
Likelihood Ratio	4.249	1	.039		
Fisher's Exact Test				.064	.064
Linear-by-Linear Association	14.012	1	.000		
N of Valid Cases	309				

Table 5.66: Chi Square Tests: Farmers Capacity building and financing sources – Development Partners sponsored for Tanzania

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.892	1	.169		
Continuity Correction	1.559	1	.212		
Likelihood Ratio	1.895	1	.169		
Fisher's Exact Test				.205	.106
Linear-by-Linear Association	1.884	1	.170		
N of Valid Cases	255				

Interpretation

From Table 5.65 and 5.66 the p- values are 0.000 and 0.169 for India and Tanzania respectively. It is less than 0.05 for India. Therefore the null hypothesis for India fails to be accepted. But it is higher than 0.05 for Tanzania. Therefore the null hypothesis fails to be rejected. This means the DP's involvement on farmer's capacity building in India is not necessary. But they play a vital role for Tanzania's farmer's capacity building..

- **Farmers crop losses and reasons associated there with**

Sub-Hypothesis

H0: Farmers crop losses were mainly caused by inadequate government support

H1: Farmers crop losses were mainly caused by climatic condition changes

Table 5.67: Chi Square Tests: Farmers Crop losses and causes - Climatic reasons for Tanzania

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.368	1	.242		
Continuity Correction	.545	1	.460		
Likelihood Ratio	1.159	1	.282		
Fisher's Exact Test				.217	.217
Linear-by-Linear Association	1.365	1	.243		
N of Valid Cases	499				

Table 5.68 Chi Square Tests: Farmers Crop losses and causes – Climatic reasons for India

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	20.347	1	.000		
Continuity Correction	4.612	1	.032		
Likelihood Ratio	4.681	1	.031		
Fisher's Exact Test				.045	.045
Linear-by-Linear Association	20.309	1	.000		
N of Valid Cases	526				

Interpretation

From Table 5.67 and 5.68 the p- values are 0.242 and 0.000 for Tanzania and India respectively. It is higher than 0.05 for Tanzania. Therefore the null hypothesis for Tanzania fails to be rejected. But the p- value for India is less than 0.05; therefore the null hypothesis for fails to be accepted. This means farmers crop losses were mainly caused by inadequate government support in Tanzania, for India climatic condition changes was the main reason.

Sub-Hypothesis

H0: Farmers crop losses were mainly caused by inadequate government support

H1: Farmers crop losses were mainly caused by economic reasons

Table 5.69 Chi Square Tests: Farmers Crop losses and causes – economic reasons for Tanzania

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.000	1	.985		
Continuity Correction	.000	1	1.000		
Likelihood Ratio	.000	1	.985		
Fisher's Exact Test				1.000	.617
Linear-by-Linear Association	.000	1	.985		
N of Valid Cases	497				

Table 5.70 Chi Square Tests: Farmers Crop losses and causes – economic reasons for India

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.182	1	.277		
Continuity Correction	.441	1	.506		
Likelihood Ratio	1.333	1	.248		
Fisher's Exact Test				.415	.263
Linear-by-Linear Association	1.180	1	.277		
N of Valid Cases	525				

Interpretation

From Table 5.69 and 5.70 the p- values are 0.985 and 0.277 for Tanzania and India respectively both of which are higher than 0.05. Therefore the null hypothesis fails to be rejected. This means farmers' crop losses were mainly caused inadequate government support within both countries.

Sub-Hypothesis

H0: Farmers crop losses were mainly caused by inadequate government support

H1: Farmers crop losses were mainly caused by poor quality of inputs

Table 5.71: Chi Square Tests: Farmers Crop losses and causes – poor quality of inputs for Tanzania

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.041	1	.839		
Continuity Correction	.000	1	1.000		
Likelihood Ratio	.081	1	.776		
Fisher's Exact Test				1.000	.960
Linear-by-Linear Association	.041	1	.840		
N of Valid Cases	499				

Table 5.72: Chi Square Tests: Farmers Crop losses and causes – poor quality of inputs for India

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.023	1	.879		
Continuity Correction	.000	1	1.000		
Likelihood Ratio	.046	1	.830		
Fisher's Exact Test				1.000	.977
Linear-by-Linear Association	.023	1	.879		
N of Valid Cases	526				

Interpretation

From Table 5.71 and 5.72 the p- values are 0.839 and 0.879 for Tanzania and India respectively both of which are higher than 0.05. Therefore the null hypothesis fails to be rejected. This means farmers' crop losses were mainly caused inadequate government support rather than poor quality of inputs within both countries.

- **Government support to farmers after crop loss and alternative means of recovery**

Sub-Hypothesis

H0: Government does not play significant role in helping farmers to revert into their normal economic statuses after experiencing crop losses.

H1: Government plays significant role in helping farmers to revert into their normal economic statuses after experiencing crop losses

Table 5.73: Chi Square Tests: Farmers' alternatives used to revert into their normal economic statuses after experiencing crop losses in Tanzania and India

Alternative means of recovery	Chi Square P-Values	
	Tanzania	**India**
Crop Insurance cover	0.893	0.895
Government grants	0.892	0.891
Loans from Banks and/or financial Institutions	0.609	0.134
Loans from individual relatives	0.288	0.000
Sale of property	0.422	0.000
Sale of husbandry	0.252	0.000
Borrowing from money lenders	0.508	0.000
Never recovered	0.346	0.588

Interpretation

From Table 5.73 the p- values of all farmers' alternatives for Tanzania are higher than 0.05 Therefore the null hypothesis for Tanzania fails to be rejected. The p- values of the first three and the last farmers' alternatives for India are higher than 0.05 therefore the null

hypotheses fail to be rejected except for these four whose p – values are less than 0.05 respectively. This means respective government does not play significant role in helping farmers to revert into their normal economic statuses after experiencing crop losses.

For Specific Objectives:

Hypotheses for objectives number one to five were explored from secondary data respectively.

Hypotheses for objectives number 6 and 7 were tested by Kruskal-Wallis Tests as it can be observed in the following illustrations. To evaluate the level of agricultural stakeholders satisfaction with government support to promote the sector growth and improve their economy through farming

5.6. 2 Kruskal-Wallis Test

Sub - Hypothesis

H0: Farmers were not satisfied with government support on land survey, acquisition and management

H1: Farmers were satisfied with government support on land survey, acquisition and management

Table 5.74: Mean Rank Farmers satisfaction with government support on land survey, acquisition and management in Tanzania

	Satisfaction level	N	Mean Rank
Government support on Land ownership	Dissatisfied	3	2.00
	Satisfied	2	4.50
	Total	5	

Table 5.75: Mean Rank Farmers satisfaction with government support on land survey, acquisition and management in India

	Satisfaction level	**N**	**Mean Rank**
Government support on Land ownership	Extremely Dissatisfied	106	186.59
	Neutral	2	138.75
	Satisfied	487	325.82
	Extremely Satisfied	4	242.88
	Total	599	

Table 5.76: Kruskal-Wallis Test – Farmers satisfaction with government support on Land ownership in the case study countries

S.N	Country	Sig. Value
1	Tanzania	0.053
2	India	0.000

Interpretation

From Table 5.76 the p- value for Tanzania is higher than 0.05 Therefore the null hypothesis for Tanzania fails to be rejected. The p- value of farmers' satisfaction with government support on Land ownership for India is less than 0.05, therefore null hypothesis fails to be accepted. This means Tanzanian farmers were not satisfied with government support on land ownership. But Indian farmers were happy with that service.

Sub-Hypothesis

H0: Farmers were not satisfied with government support on agricultural financial facilities

H1: Farmers were satisfied with government support on agricultural financial facilities

Table 5.77: Mean Ranks Farmers satisfaction with government support on agriculture financial facilities in Tanzania

	Satisfaction Level	N	Mean Rank
Government support on Financial Facilities	Extremely Dissatisfied	4	226.75
	Dissatisfied	10	247.2
	Neutral	8	226.75
	Satisfied	387	203.24
	Total	409	

Table 5.78: Mean Ranks Farmers satisfaction with government support on agriculture financial facilities in India

	Satisfaction Level	N	Mean Rank
Government support on Financial Facilities	Extremely Dissatisfied	4	205.00
	Dissatisfied	10	205.00
	Neutral	8	205.00
	Satisfied	387	205.00
	Total	409	

Table 5.79: Kruskal-Wallis Test – Farmers satisfaction with government support on financial facilities in the case study countries

S.N	Country	Sig. Value
1	Tanzania	0.481
2	India	1.000

Interpretation

From Table 5.79 the p- values for Tanzania and India are higher than 0.05. Therefore the null hypothesis fails to be rejected. This means farmers from both countries were not satisfied with government support on financial facilities or service.

Sub-Hypothesis

H0: Farmers were not satisfied with government support on agriculture mechanization

H1: Farmers were satisfied with government support on agriculture mechanization

Table 5.80: Mean Rank Farmers satisfaction with government support on agriculture mechanization in Tanzania and India

Particulars		**Tanzania**		**India**	
Farming Instrument	Satisfaction Level	N	Mean Rank	N	Mean Rank
Hand Hoe	Extremely Dissatisfied	4	183.50	130	111.00
	Dissatisfied	186	180.59	72	107.33
	Neutral	8	183.50	8	116.50
	Satisfied	163	181.29	10	122.00
	Total	361		220	
Plough	Extremely Dissatisfied	4	195.50	130	109.50
	Dissatisfied	186	184.83	72	110.42
	Neutral	8	195.50	8	128.75
	Satisfied	163	175.57	10	109.50
	Total	361		220	
Power Tiller	Extremely Dissatisfied	4	183.00	130	114.58
	Dissatisfied	186	180.09	72	106.75
	Neutral	8	183.00	8	106.75
	Satisfied	163	181.89	10	87.50
	Total	361		220	
		N	Mean Rank	N	Mean Rank
Tractor	Extremely Dissatisfied	4	177.00	130	109.96
	Dissatisfied	186	180.88	72	112.81
	Neutral	8	177.00	8	109.75
	Satisfied	163	181.43	10	101.50
	Total	361		220	

Table 5.81: Kruskal-Wallis Test – Farmers satisfaction with government support on agriculture mechanization in the case study countries

	Tanzania	India
	Sig. Value	Sig. Value
Hand Hoe	0.966	0.821
Plough	0.244	0.707
Power Tiller	0.819	0.036
Tractor	0.957	0.807

Interpretation

From Table 5.81 the p- values for Tanzania and India are higher than 0.05. Therefore the null hypothesis fails to be rejected. This means farmers from both countries were not satisfied with government support on agriculture mechanization service.

Sub-Hypothesis

H0: Farmers were not satisfied with government support on crop loans

H1: Farmers were satisfied with government support on crop loan

Table 5.82: Mean Rank Farmers satisfaction with government support on crop loans in Tanzania

Satisfaction Level		N	Mean Rank
Government support on crop loan or Subvention	Extremely Dissatisfied	1	3.5
	Dissatisfied	1	3.5
	Neutral	1	3.5
	Satisfied	1	3.5
	Extremely Satisfied	1	1
	Total	5	

Table 5.83: Mean Ranks Farmers satisfaction with government support on crop loans in Tanzania

	Satisfaction Level	N	Mean Rank
Government support on crop loan or Subvention	Extremely Dissatisfied	3	4.5
	Dissatisfied	4	4.5
	Satisfied	1	4.5
	Total	8	

Table 5.84: Kruskal-Wallis Test – Farmers satisfaction with government support on crop loan in the case study countries

S.N	Country	Sig. Value
1	Tanzania	0.406
2	India	1.000

Interpretation

From Table 5.85 the p- values for Tanzania and India are higher than 0.05. Therefore the null hypothesis fails to be rejected. This means farmers from both countries were not satisfied with government support on crop loans.

Sub-Hypothesis

H0: Farmers were not satisfied with government support on warehousing

H1: Farmers were satisfied with government support on warehousing

Table 5.85: Mean Ranks Farmers satisfaction with government support on warehousing in Tanzania

	Satisfaction level	N	Mean Rank
Government support on Warehousing	Extremely Dissatisfied	61	61
	Dissatisfied	5	61
	Neutral	1	61
	Satisfied	54	61
	Total	121	

Table 5.86: Mean Ranks Farmers satisfaction with government support on warehousing in India

	Satisfaction Level	N	Mean Rank
Government support on Warehousing	Dissatisfied	4	196.50
	Neutral	4	196.50
	Satisfied	384	196.50
	Total	392	

Table 5.87: Kruskal-Wallis Test – Farmers satisfaction with government support on warehousing in the case study countries

S.N	Country	Sig. Value
1	Tanzania	1.000
2	India	1.000

Interpretation

From Table 5.87 the p- values for Tanzania and India are higher than 0.05. Therefore the null hypothesis fails to be rejected. This means farmers from both countries were not satisfied with government support on warehousing.

Sub-Hypothesis

H0: Farmers were not satisfied with government support on transport infrastructure

H1: Farmers were satisfied with government support on transport infrastructure

Table 5.88: Mean Ranks Farmers satisfaction with government support on transport infrastructure in Tanzania

	Level of Satisfaction	N	Mean Rank
Government support on Transport Infrastructure	Extremely Dissatisfied	503	252.50
	Dissatisfied	1	252.50
	Total	504	

Table 5.89: Mean Ranks Farmers satisfaction with government support on transport infrastructure in India

	Level of Satisfaction	N	Mean Rank
Government support on Transport Infrastructure	Extremely Dissatisfied	262	281.00
	Dissatisfied	8	281.00
	Neutral	10	281.00
	Satisfied	281	281.00
	Total	561	

Table 5.90: Kruskal-Wallis Test – Farmers satisfaction with government support on transport infrastructure in the case study countries

S.N	Country	Sig. Value
1	Tanzania	1.000
2	India	1.000

Interpretation

From Table 5.90 the p- values for Tanzania and India are higher than 0.05. Therefore the null hypothesis fails to be rejected. This means farmers from both countries were not satisfied with government support on transport infrastructure.

5.6. 3 Mann-Whitney U Test

Sub - Hypothesis: Relationship between land size and Farming instruments used

H0: Land size is not a determinant of the farming instruments to be used but accessibility

H1: Land size determines the farming instruments to be used rather than accessibility

Table 5.91: Mann-Whitney Ranks Table for Tanzania

	What is the size of Land you own for farming?	N	Mean Rank	Sum of Ranks
Which Farming Instrument do you use-H/Hoe	Small	223	225.40	50264.00
	Medium	236	234.35	55306.00
	Total	459		
Which Farming Instrument do you use-Plough?	Small	223	251.60	56107.00
	Medium	236	209.59	49463.00
	Total	459		
Which Farming Instrument do you use-P/Tiller?	Small	223	229.71	51225.00
	Medium	236	230.28	54345.00
	Total	459		
Which Farming Instrument do you use-Tractor?	Small	223	224.71	50111.00
	Medium	236	235.00	55459.00
	Total	459		

Table 5.92: Mann-Whitney Test Statistics Table for Tanzania

	Which Farming Instrument do you use-H/Hoe	Which Farming Instrument do you use-Plough?	Which Farming Instrument do you use-P/Tiller?	Which Farming Instrument do you use-Tractor?
Mann-Whitney U	25288.000	21497.000	26249.000	25135.000
Wilcoxon W	50264.000	49463.000	51225.000	50111.000
Z	-.983	-4.236	-.129	-1.612
Asymp. Sig. (2-tailed)	.326	.000	.897	.107

Table 5.93: Mann-Whitney Ranks Table for India

	What is the size of Land you own for farming?	N	Mean Rank	Sum of Ranks
Which Farming Instrument do you use-H/Hoe	Small	238	247.40	58881.00
	Medium	254	245.66	62397.00
	Total	492		
Which Farming Instrument do you use-Plough?	Small	238	242.69	57761.00
	Medium	254	250.07	63517.00
	Total	492		
Which Farming Instrument do you use-P/Tiller?	Small	238	246.40	58643.00
	Medium	254	246.59	62635.00
	Total	492		
Which Farming Instrument do you use-Tractor?	Small	238	250.34	59580.00
	Medium	254	242.91	61698.00
	Total	492		

Table 5.94: Mann-Whitney Test Statistics[a] Table for India

	Which Farming Instrument do you use-H/Hoe	Which Farming Instrument do you use-Plough?	Which Farming Instrument do you use-P/Tiller?	Which Farming Instrument do you use-Tractor?
Mann-Whitney U	30012.000	29320.000	30202.000	29313.000
Wilcoxon W	62397.000	57761.000	58643.000	61698.000
Z	-.620	-1.188	-.080	-2.085
Asymp. Sig. (2-tailed)	.535	.235	.936	.037

a. Grouping Variable: What is the size of Land you own for farming?

Interpretation

From Table 5.94 all p- values except for plough in Tanzania all for India are higher than 0.05. Therefore the null hypothesis fails to be rejected. This means Land size is not a determinant of the farming instruments to be used by a particular farmer rather than accessibility of the respective instruments. But the null hypothesis for plough in Tanzania is rejected. Therefore for Tanzania, Land size is a determinant for acquiring a plough for farming

5.7 Expected economic impacts from government investment on agriculture sector and the actual situation at the lower levels

In a bid to explain the relationship between public investment, agriculture sector and economic growth, the researcher decided to test it by using three major form; secondary data, previous studies by the other intellectuals and primary data from the prospective beneficiaries.

From the secondary data point of view the researcher used some of the important endogenous factors to the growth of the sector termed as (p-factors), the expected exogenous factors termed as the (r-factors) respectively assuming the quantity of resources injected to the sector at a particular time as an independent factor and the exogenous factor. The p-factor include the percent of arable land equipped for irrigation, fertilizer consumption (kg/ha), Number of Agricultural Experts (FTE) present, total expenditure per ha of arable land and capital expenditure per ha of arable land. The r-factors include food grain production per ha (kg/ha), number of undernourished people (million), cereal yield trends (kg/ha) and domestic food price volatility (index).

If P_1 = percentage of arable land equipped for irrigation in both countries respectively.

Then as it can be observed in Table 5.95 it is observed that there are no direct relationships between public investment and the percentage of arable land equipped for irrigation in Tanzania. Despite the inconsistence of budgetary allocation to the sector, the percentage of arable land equipped for irrigation has maintained a constant fall with time. However, this might have caused by other factors like marginalization of the irrigation sector by the respective government. While in India a unit change in percentage of resources allocation to the agriculture sector have been causing an increase of 0.2 percent of arable land equipped for irrigation on average.

Table 5.95: Analysis of economic impacts resulting from a unit injection of public resources allocated to the agriculture sector through percentage of arable land equipped for irrigation in both countries

Year	Tanzania				India			
	Budget (%)	Annual % Change (A)	P_1	Annual % Change (B)	Budget	Annual % Change (A)	P_1	Annual % Change (B)
2005	4.7	-	2	-	5.6	-	40.1	-
2006	5.8	22.7	1.9	(5.0)	6.3	11.8	40.6	1.2
2007	5.8	-	1.9	-	6.5	4.3	41.1	1.2
2008	6.2	7.4	1.8	(5.3)	6.9	5.1	41.6	1.2
2009	7.2	15.5	1.7	(5.6)	7.9	15.7	41.9	0.7
2010	7.6	6.0	1.6	(5.9)	7.0	(11.8)	42.2	0.7
2011	7.8	2.4	1.6	-	6.9	(1.9)	42.4	0.5
2012	6.9	(12.0)	1.5	(6.3)	6.3	(7.7)	42.6	0.5
2013	7.4	7.4	1.4	(6.7)	6.6	3.5	42.7	0.2
2014	5.0	(32.3)	1.5	7.1	6.7	2.3	42.9	0.5
2015	5.5	9.6	1.4	(6.7)	7.6	13.7	43	0.2
Average		**2.7**		**(3.4)**		**3.5**		**0.7**

Source: Self computation using FAO, Min. of Finance – India and Min. of agriculture – Tanzania respectively

Table 5.96: Analysis of economic impacts resulting from a unit % of public resources allocated to the sector based on per ha consumption in both countries

Year	Tanzania				India			
	Budget (%)	Annual % ▲	P_2	Annual % ▲	Budget (%)	Annual % ▲	P_2	Annual % ▲
2006	5.8	-	5.4	-	6.3	-	136.4	-
2007	5.8	-	5.1	(5.6)	6.5	4.3	142.8	4.7
2008	6.2	7.4	4.7	(7.8)	6.9	5.1	153.3	7.4
2009	7.2	15.5	7.5	59.6	7.9	15.7	167.5	9.3
2010	7.6	6	8.8	17.3	7	(11.8)	179	6.9
2011	7.8	2.4	8.6	(2.3)	6.9	(1.9)	180.8	1.0
2012	6.9	(12)	7.7	(10.5)	6.3	(7.7)	164.8	(8.8)
2013	7.4	7.4	4.7	(39.0)	6.6	3.5	158.2	(4.0)
2014	5	(32.3)	8.5	80.9	6.7	2.3	165.1	4.4
2015	5.5	9.6	8.8	3.5	7.6	13.7	167.2	1.3
Average		3.0		9.6		3.5		2.2

Source: Self computation using WB 2016 Min. of Finance – India and Min. of agriculture – Tanzania respectively

$P_{2 =}$ Average annual fertilizer consumption (kg/ha) in each of the countries respectively

From Table 5.96 it can be interpreted that there was inconsistence of change between public investment to the sector and per ha consumption of fertilizers in Tanzania. This may have caused by other factors like lack of fertilizer manufacturing industries and high importation costs. However, on average an act to increase the percentage of resources allocation to the agriculture sector could result into a 3.2 percent of the rate of annual fertilizer consumption per ha. While in India a proportionate change between public investments to the sector and per ha consumption of fertilizers is observed. A unit change in percentage of resources allocation to the agriculture sector have been causing an increase of 0.63 percent of annual fertilizer consumption per ha on average.

Table 5.97: Analysis of economic impacts resulting from a unit percent of public resources allocated to the agriculture sector based on a number of qualified agricultural experts full time employed (FTE) in both countries

Year	Tanzania				India			
	Budget (%)	Annual % ▲	P_3	Annual % ▲	Budget (%)	Annual % ▲	P_3	Annual % ▲
2005	4.7	-	687	-	5.6		12,283	-
2006	5.8	23.4	697	1.5	6.3	12.5	11,720	(4.6)
2007	5.8	-	695	(0.3)	6.5	3.2	11,395	(2.8)
2008	6.2	6.9	690	(0.7)	6.9	6.2	11,379	(0.1)
2009	7.2	16.1	684	(0.9)	7.9	14.5	11,217	(1.4)
2010	7.6	5.6	693	1.3	7.0	(11.4)	11,330	1.0
2011	7.8	2.6	815	17.6	6.9	(1.4)	11,308	(0.2)
2012	6.9	(11.5)	813	(0.2)	6.3	(8.7)	12,650	11.9
2013	7.4	7.2	855	5.2	6.6	4.8	13,109	3.6
2014	5.0	(32.4)	911	6.5	6.7	1.5	13,716	4.6
2015	5.5	10.0	958	5.2	7.6	13.4	14,515	5.8
Average		**2.8**		**3.5**		**3.5**		**1.8**

Source: Self computation using FAOSTAT 2016 data, Min. of Finance – India and Min. of agriculture – Tanzania respectively

P_3 = Annual average number of qualified agricultural experts full time employed (FTE) of the countries respectively

From Table 5.97 it can be interpreted that there was an inverse relationship between of change between public investment to the sector and the average number of qualified agricultural experts full time employed within both countries. However, on average, an act to increase the percentage of resources allocation to the agriculture sector I n Tanzania, could result into a 1.25 percent increase of the average number of qualified agricultural experts full time employed. For India a unit percentage change of resources allocation to the agriculture sector could cause an increase of 0.51 percent of average number of qualified agricultural experts full time employed on average.

Table 5.98: Analysis of economic impacts resulting from a unit percent of public resources allocated to the agriculture sector based on the total sector expenditure per ha of arable land

Year	Tanzania				India			
	Budget (%)	**Annual % ▲**	**P_4**	**Annual % ▲**	**Budget (%)**	**Annual % ▲**	**P_4**	**Annual % ▲**
2006	5.8		21		6.3	-	83	-
2007	5.8	-	23	9.5	6.5	3.2	101	21.7
2008	6.2	6.9	27	17.4	6.9	6.2	129	27.7
2009	7.2	16.1	35	29.6	7.9	14.5	174	34.9
2010	7.6	5.6	46	31.4	7.0	(11.4)	170	(2.3)
2011	7.8	2.6	53	15.2	6.9	(1.4)	203	19.4
2012	6.9	(11.5)	43	(18.9)	6.3	(8.7)	195	(3.9)
2013	7.4	7.2	50	16.3	6.6	4.8	213	9.2
2014	5.0	(32.4)	41	(18.0)	6.7	1.5	235	10.3
2015	5.5	10.0	46	12.2	7.6	13.4	274	16.6
Average		**0.5**		**10.5**		**2.4**		**14.8**

Source: Self computation using FAOSTAT 2016 data, Min. of Finance – India and Min. of agriculture – Tanzania respectively

P_4 = Average annual total sector expenditure per ha (U$/ha) of arable land in each country respectively

From Table 5.98 it can be interpreted that the change in total sector expenditure per ha of arable of land has been directly proportional to change in percentage of resources allocation to the agriculture sector within both countries. In Tanzania, on average an act to increase the percentage of resources allocation to the agriculture sector could result into a 21 percent increase of total sector expenditure per ha of arable of land. For India a unit change in percentage of resources allocation to the agriculture sector have been causing an increase of 6.2 percent increase of total sector expenditure per ha of arable of land on average.

Table 5.99: Analysis of economic impacts resulting from a unit percent of public resources allocated to the agriculture sector based on capital expenditure per ha of arable land

Year	Tanzania				India			
	Budget (%)	**Annual % ▲**	**P_5**	**Annual % ▲**	**Budget (%)**	**Annual % ▲**	**P_5**	**Annual % ▲**
2006	5.8	-	9	-	6.3	-	8	-
2007	5.8	-	10	11.1	6.5	3.2	11	37.5
2008	6.2	7.4	13	30.0	6.9	6.2	13	18.2
2009	7.2	15.5	14	7.7	7.9	14.5	17	30.8
2010	7.6	6.0	11	(21.4)	7.0	(11.4)	23	35.3
2011	7.8	2.4	12	9.1	6.9	(1.4)	16	(30.4)
2012	6.9	(12.0)	11	(8.3)	6.3	(8.7)	21	31.3
2013	7.4	7.4	20	81.8	6.6	4.8	22	4.8
2014	5.0	(32.3)	13	(35.0)	6.7	1.5	22	-
2015	5.5	9.6	14	7.7	7.6	13.4	38	72.7
Average		**0.4**		**8.3**		**2.4**		**22.2**

Source: Self computation using FAOSTAT 2016 data, Min. of Finance – India and Min. of agriculture – Tanzania respectively

P_5 = Annual average capital expenditure per ha of arable land in each country respectively

From Table 5.99 it is observed that the change in capital expenditure per ha of arable of land has been directly proportional to change in percentage of resources allocation to the agriculture sector within both countries. In Tanzania, a change by one percentage increase of resources allocation to the agriculture sector could result into about 21 percent increase of capital expenditure per ha of arable of land. For India a unit change in percentage of resources allocation to the agriculture sector could cause an increase of 9.25 percent increase of capital expenditure per ha of arable of land on average.

From the exogenous factors (r-factors) point of view, the researcher carried out the following analysis or tests also using secondary data collected from the respective countries. The researcher also aimed to check if there were any bond between the resources allocated to the agriculture sector and the economic benefits thereon.

Table 5.100: Analysis of economic impacts resulting from a unit percent of public resources allocated to the agriculture sector based on cereal yield (kg/ha) in Tanzania and India

Year	Tanzania				India			
	Budget (%)	Annual % ▲	R_1	Annual % ▲	Budget (%)	Annual % ▲	R_1	Annual % ▲
2006	5.8	-	1,327	-	6.3	-	2,447	-
2007	5.8	-	1,427	7.5	6.5	3.2	2,583	5.6
2008	6.2	7.4	1,334	(6.5)	6.9	6.2	2,638	2.1
2009	7.2	15.5	1,110	(16.8)	7.9	14.5	2,581	(2.2)
2010	7.6	6.0	1,648	48.5	7.0	(11.4)	2,676	3.7
2011	7.8	2.4	1,390	(15.7)	6.9	(1.4)	2,861	6.9
2012	6.9	(12.0)	1,319	(5.1)	6.3	(8.7)	3,010	5.2
2013	7.4	7.4	1,418	7.5	6.6	4.8	2,963	(1.6)
2014	5.0	(32.3)	1,660	17.1	6.7	1.5	2,981	0.6
2015	5.5	9.6	1,790	7.8	7.6	13.4	3,122	4.7
Average		**0.4**		**4.4**		**2.4**		**2.8**

Source: Self computation using FAOSTAT 2016 data, Min. of Finance – India and Min. of agriculture – Tanzania respectively

R_1 = Annual cereal yield (kg/ha) in each country respectively

From Table 5.100 it is observed that there was an inverse relationship between between public investment to the sector and the average annual cereal yield (kg/ha) within both countries. However, on average, in Tanzania an increase of resources allocation to the agriculture sector by one percentage could result into about 11 percent increase of annual cereal yield (kg/ha). For India a unit change in percentage of resources allocation to the agriculture sector could cause an increase of 1.2 percent increase of Annual cereal yield (kg/ha) on average.

Table 5.101: Analysis of economic impacts resulting from a unit percent of public resources allocated to the agriculture sector based on number of undernourished people (million) in Tanzania and India

Year	Tanzania				India			
	Budget (%)	**Annual % ▲**	**R_2**	**Annual % ▲**	**Budget (%)**	**Annual % ▲**	**R_2**	**Annual % ▲**
2007	5.8	-	14.1	-	6.5	-	233.8	
2008	6.2	7.4	14.1	-	6.9	6.2	218.7	(6.5)
2009	7.2	15.5	14.3	1.4	7.9	14.5	202.5	(7.4)
2010	7.6	6.0	15.1	5.6	7.0	(11.4)	192.6	(4.9)
2011	7.8	2.4	15.6	3.3	6.9	(1.4)	189.7	(1.5)
2012	6.9	(12.0)	16.1	3.2	6.3	(8.7)	189.9	0.1
2013	7.4	7.4	16	(0.6)	6.6	4.8	191	0.6
2014	5.0	(32.3)	16.1	0.6	6.7	1.5	193.1	1.1
2015	5.5	9.6	16.3	1.2	7.6	13.4	194.1	0.5
Average		0.5		1.8		2.4		(2.2)

Source: Self computation using FAOSTAT 2016 data, Min. of Finance – India and Min. of agriculture – Tanzania respectively

R_2 = Annual average number of undernourished people (million) in each country respectively

From Table 5.101 it is observed that the change in annual number of undernourished people has been directly proportional to change in percentage of resources allocation to

the agriculture sector within both countries. In Tanzania, an increase of resources allocation to the agriculture sector by one percentage could result into about 3.6 percent decrease of annual number undernourished people. However, things have been converse; the number of undernourished people has been increasing with time. This may have been caused by other related factors. For India a unit change in percentage of resources allocation to the agriculture sector could cause a reduction of 0.92 percent of the annual number of undernourished people on average.

Table 5.102: Analysis of economic impacts resulting from a unit percent of public resources allocated to the agriculture sector based on domestic food price volatility (index) in Tanzania and India

Year	Tanzania				India			
	Budget (%)	**Annual % ▲**	**R_3**	**Annual % ▲**	**Budget (%)**	**Annual % ▲**	**R_3**	**Annual % ▲**
2007	5.8	-	11		6.5	-	4.7	-
2008	6.2	7.4	8.1	(26.4)	6.9	6.2	6.8	13.2
2009	7.2	15.5	8.5	4.9	7.9	14.5	7.7	(54.5)
2010	7.6	6	12	41.2	7	(11.4)	3.5	(14.3)
2011	7.8	2.4	4.9	(59.2)	6.9	(1.4)	3	66.7
2012	6.9	(12)	4.9	-	6.3	(8.7)	5	28
2013	7.4	7.4	7	42.9	6.6	4.8	6.4	31.3
2014	5	(32.3)	4.8	(31.4)	6.7	1.5	8.4	(21.4)
2015	5.5	9.6	4.9	2.1	7.6	13.4	6.6	44.7
Average		**0.5**		**(3.7)**		**2.4**		**11.7**

Source: Self computation using FAOSTAT 2016 data, Min. of Finance – India and Min. of agriculture – Tanzania respectively

R_3 = domestic food price volatility (index) in each country respectively

From Table 5.102 it is observed that in Tanzania, a unit change in percentage of resources allocation to the agriculture sector could cause a reduction of about 7.4 percent of domestic food price volatility (index). In India an increase of resources allocation to the agriculture sector by one percentage was in a converse relationship with the domestic

food price volatility (index) as it could result into about 4.9 percent increase. This may have been caused by other related factors.

Table 5.103: Analysis of economic impacts resulting from a unit percent of public resources allocated to the agriculture sector based on food grain production ('000') tones in Tanzania

Year	Allocations (%)		Wheat		Maize		Beans Dry		Beans Green		Rice Paddy	
	Budget	Annual % ▲	A. P	Annual % ▲	A. P	Annual % ▲	A. P	Annual % ▲	A. P	Annual % ▲	A. P	Annual % ▲
2005	5.8	-	102	-	3,132	-	626	-	1	-	1168	-
2006	5.8	-	110	7.8	3,423	9.3	708	13.1	1	-	1206	3.3
2007	6.2	7.4	83	(24.5)	3,659	6.9	889	25.6	3	200.0	1342	11.3
2008	7.2	15.5	43	(48.2)	5,441	48.7	571	(35.8)	4	33.3	1421	5.9
2009	7.6	6.0	82	90.7	3,326	(38.9)	774	35.6	3	(25.0)	1335	(6.1)
2010	7.8	2.4	62	(24.4)	4,733	42.3	868	12.1	3	-	2650	98.5
2011	6.9	(12.0)	113	82.3	4,341	(8.3)	676	(22.1)	4	33.3	2248	(15.2)
2012	7.4	7.4	109	(3.5)	5,104	17.6	1,199	77.4	4	-	1801	(19.9)
2013	5.0	(32.3)	104	(4.6)	5,356	4.9	1,114	(7.1)	5	25.0	2195	21.9
2014	5.5	9.6	167	60.6	6,737	25.8	1,115	0.1	6	20.0	2621	19.4
Average		0.5		15.1		12.0		11.0		31.9		13.2

Source: Self computation using FAOSTAT 2016 data, Min. of Finance – India and Min. of agriculture – Tanzania respectively

A. P = Average annual production of the respective food grain in '000' tones

From Table 5.103 it is observed that in Tanzania, on average, the food grain production trends were directly proportional to the respective public investment in a particular year. Thus, a unit change in percentage of resources allocation to the agriculture sector could cause an average increase of food grain production about 33.3 percent of wheat, 11.9 percent for maize, 24.4 percent for beans dry, 70.7 percent for beans green and 29.4 percent for rice paddy.

Table 5.104: Analysis of economic impacts resulting from a unit percent of public resources allocated to the agriculture sector based on food grain production ('000') tones in India

Year	Allocation (%)		Wheat		Maize		Beans Dry		Beans Green		Rice Paddy	
	Budget	Annual % ▲	A. P	Annual % ▲	A. P	Annual % ▲	A. P	Annual % ▲	A. P	Annual % ▲	A. P	Annual % ▲
2005	5.6	-	68,637	-	14,710	-	2,631	-	505	-	137,690	-
2006	6.3	11.8	69,354	1.0	15,097	2.6	3,270	24.3	522	3.4	139,137	1.1
2007	6.5	4.3	75,807	9.3	18,955	25.6	3,930	20.2	538	3.1	144,570	3.9
2008	6.9	5.1	78,570	3.6	19,731	4.1	3,010	(23.4)	554	3.0	148,036	2.4
2009	7.9	15.7	80,679	2.7	16,720	(15.3)	2,430	(19.3)	571	3.1	135,673	(8.4)
2010	7.0	(11.8)	80,804	0.2	21,726	29.9	4,890	101.2	586	2.6	143,963	6.1
2011	6.9	(1.9)	86,874	7.5	21,760	0.2	4,330	(11.5)	601	2.6	157,900	9.7
2012	6.3	(7.7)	94,880	9.2	22,260	2.3	3,710	(14.3)	620	3.2	157,800	(0.1)
2013	6.6	3.5	93,510	(1.4)	23,290	4.6	3,630	(2.2)	620	-	159,200	0.9
2014	6.7	2.3	95,850	2.5	23,670	1.6	4,110	13.2	636	2.6	157,200	(1.3)
Average		**2.4**		**3.8**		**6.2**		**9.8**		**2.6**		**1.6**

Source: Self computation using FAOSTAT 2016 data, Min. of Finance – India and Min. of agriculture – Tanzania respectively

A. P = Average annual production of the respective food grain in '000' tones

From Table 5.104 it is observed that in India, there was no direct relationship between public investment and the food grain production trends in a particular year. However, on average a unit change in percentage of resources allocation to the agriculture sector could cause an average increase of food grain production about 1.6 percent of wheat, 2.6 percent for maize, 4.2 percent for beans dry, 1.1 percent for beans green and 0.7 percent for rice paddy.

Table 5.105: Analysis of economic impacts resulting from a unit percent of public resources allocated to the agriculture sector based on GDP in Tanzania and India

Year	Tanzania				India			
	Budget (%)	Annual % ▲	GDP	Annual % ▲	Budget (%)	Annual % ▲	GDP	Annual % ▲
2006	5.8	-	31.00		6.30	-	18.80	
2007	5.8	-	28.80	(0.07)	6.50	0.03	18.30	(0.03)
2008	6.2	0.07	30.80	0.07	6.90	0.06	18.30	-
2009	7.2	0.15	32.40	0.05	7.90	0.14	17.80	(0.03)
2010	7.6	0.06	32.00	(0.01)	7.00	(0.11)	17.70	(0.01)
2011	7.8	0.02	31.30	(0.02)	6.90	(0.01)	18.20	0.03
2012	6.9	(0.12)	33.20	0.06	6.30	(0.09)	17.90	(0.02)
2013	7.4	0.07	33.30	0.00	6.60	0.05	17.50	(0.02)
2014	5.0	(0.32)	31.50	(0.05)	6.70	0.02	18.20	0.04
2015	5.5	0.10	32.00	0.02	7.60	0.13	17.80	(0.02)
Average		0.005		0.005		0.02		(0.01)

Source: Self computation using data from Min. of Finance – India and Min. of agriculture – Tanzania respectively

From Table 5.105 it is observed that the contribution of the sector to the national GDP has been directly proportional to change in percentage of resources allocation to the agriculture sector within both countries. In Tanzania, on average, an act to increase a unit percent of resources allocation to the agriculture sector could result into about 1.03 percent growth of the annual agricultural GDP. For India the GDP has been falling with time despite the slightly increase of the budgetary allocation to the sector. However, a unit change in percentage of resources allocation to the agriculture sector could cause about 1.28 percent growth of the annual agricultural GDP on average.

5.8 Test of the economic impacts resulting from public investment to the agriculture sector using linear regression analysis

Table 5.106: Model summary –Tanzania

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.974[a]	.948	.884	.33450

a. Predictors: (Constant), Total expenditure per ha of arable land, Capital expenditure per ha of arable land, Number of Experts_FTE, Average annual per ha consumption, Arable land equipped for irrigation

Table 5.107: ANOVA[a] table economic benefits test for Tanzania

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.225	5	1.645	14.701	.011[b]
	Residual	.448	4	.112		
	Total	8.672	9			

a. Dependent Variable: % of total govt expenditure allocated to the sector

b. Predictors: (Constant), Total expenditure per ha of arable land, Capital expenditure per ha of arable land, Number of Experts(FTE), Average annual per ha consumption, Arable land equipped for irrigation

Table 5.108: Coefficients[a] economic benefits test for Tanzania

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.728	6.223		1.563	.193
	Arable land equipped for irrigation	.416	2.210	.080	.188	.860
	Average annual per ha consumption?	-.169	.126	-.307	-1.335	.253
	Number of Experts (FTE)	-.009	.002	-.962	-4.259	.013
	Capital expenditure per ha of arable land	-.018	.077	-.056	-.234	.826
	Total expenditure per ha of arable land	.121	.025	1.403	4.844	.008

Table 5.109: Coefficients[a] economic benefits test for Tanzania

Model		95.0% Confidence Interval for B	
		Lower Bound	Upper Bound
1	(Constant)	-7.550	27.005
	Arable land equipped for irrigation	-5.719	6.551
	Average annual per ha consumption?	-.520	.182
	Number of Experts_FTE	-.015	-.003
	Capital expenditure per ha of arable land	-.233	.196
	Total expenditure per ha of arable land	.052	.190

a. Dependent Variable: % of total govt expenditure allocated to the sector

A multiple linear regression was conducted to predict whether there were any impacts from public spending on agriculture based on endogenous factors – arable land equipped for irrigation, per ha consumption of fertilizers, number of experts (FTE), capital expenditure per ha of arable land and total expenditure per ha of arable land.

A significant regression equation was found ($F(5, 4) = 14.701$, $p < .011$) with an R^2 of .884

The economic benefit predicted from budget allocation equation to the sector is given by as: 9.728 -.169 (FC) -.018(CE) - .009(NE) +.121(TE) +.416(ALI)

Where FC = Per ha fertilizer consumption measured in ka/ha

CE= Capital expenditure per ha of arable land (US$/ha)

NE= Nummber of agricultural experts (FTE)

TE= Total expenditure per ha of arable land (US$/ha)

ALI= percentage of arable land equipped for irrigation (%)

A unit increase of budget allocation to the sector could decrease per ha fertilizer consumption by .169 kg/ha, decreased the capital expenditure per ha of arable land by .018 US$/ha, decrease the Number of agricultural experts (FTE), increase the total expenditure per ha of arable land by .121US$/ha and increased the arable land equipped for irrigation by .416 percent.

All items were significant predictors of the economic advantages from public investment to agriculture sector.

Table 5.110: Model Summary economic benefits test for India

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.904[a]	.817	.589	.33789

a. Predictors: (Constant), Total expenditure per ha of arable land, Average annual per ha consumption, Capital expenditure per ha of arable land, Arable land equipped for irrigation, Number of Experts (FTE)

Table 5.111: ANOVA[a] economic benefits test for India

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.044	5	.409	3.581	.120[b]
	Residual	.457	4	.114		
	Total	2.501	9			

a. Dependent Variable: % of total govt expenditure allocated to the sector

b. Predictors: (Constant), Total expenditure per ha of arable land, Average annual per ha consumption?, Capital expenditure per ha of arable land, Arable land equipped for irrigation, Number of Experts_FTE

Table 5.112: Coefficients[a] economic benefits test for India

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	64.893	23.560		2.754	.051
	Arable land equipped for irrigation	-1.104	.629	-1.667	-1.756	.154
	Average annual per ha consumption?	-.040	.032	-1.088	-1.242	.282
	Number of Experts_FTE	-.001	.000	-2.174	-2.185	.094
	Capital expenditure per ha of arable land	.066	.036	1.048	1.838	.140
	Total expenditure per ha of arable land	.031	.011	3.492	2.687	.055

Table 5.113: Coefficients[a] economic benefits test for India

Model		**95.0% Confidence Interval for B**	
		Lower Bound	**Upper Bound**
1	(Constant)	-.520	130.306
	Arable land equipped for irrigation	-2.850	.641
	Average annual per ha consumption?	-.130	.050
	Number of Experts_FTE	-.002	.000
	Capital expenditure per ha of arable land	-.034	.165
	Total expenditure per ha of arable land	-.001	.063

a. Dependent Variable: % of total govt expenditure allocated to the sector

A multiple linear regression was conducted to predict whether there were any impacts from public spending on agriculture based on endogenous factors – arable land equipped for irrigation, per ha consumption of fertilizers, number of experts (FTE), capital expenditure per ha of arable land and total expenditure per ha of arable land.

A significant regression equation was found (F (5, 4) = 3.581, $p < .120$ with an R^2 of .817

The economic benefit predicted from budget allocation equation to the sector is given by as: 64.893 -1.104 (ALI) -.040(FC) - .001(NE) +.031(TE) + .066(CE)

Where FC = Per ha fertilizer consumption measured in ka/ha
CE= Capital expenditure per ha of arable land (US$/ha)
NE= Number of agricultural experts (FTE)
TE= Total expenditure per ha of arable land (US$/ha)
ALI= percentage of arable land equipped for irrigation (%)

A unit increase of budget allocation to the sector could decrease the arable land equipped for irrigation by 1.104 percent, per ha fertilizer consumption by .040 kg/ha, decreased the Number of agricultural experts (FTE), by .001, increased the total expenditure per ha of arable land by .031US$/ha and increased the capital expenditure per ha of arable land by .066US$/ha respectively.

All items were significant predictors of the economic advantages from public investment to agriculture sector.

Based on the above analysis it is observed that there are direct economic impacts on the agriculture sector resulting from the public investment on the endogenous factors – (percent of arable land equipped for irrigation, fertilizer consumption (kg/ha), Number of Agricultural Experts (FTE) present, total expenditure per ha of arable land and capital expenditure per ha of arable land). It can therefore be summarized that since the prosperity the endogenous factors is dependent on public investment and since agricultural growth is highly determined by the endogenous factors among many other factors as well, then there are direct economic impacts resulting from public investment to the agriculture sector.

From the previous studies by the other intellectuals' context, it was confirmed that there are positive economic impacts resulting from public investment on agriculture sector. Several studies (De Janvry and Sadoulet 2010, Cleaver 2013, Mogues et al 2012, Ravallion 2001 and the World Bank 2007) have confirmed this. According to the World Bank (2007) as quoted by Cleaver (2013), investment in agriculture is 2.5 to 3 times more effective in increasing the income of the poor than is non-agricultural investment. De Janvry and Sadoulet (2010) found that a 1 percent growth in agriculture induces a direct reduction in the poverty rate of 1.73 percent. But Ravallion (2001) found that a rise in average household income by one percent leads to a fall in the poverty rates by about doubled percent on average while Cleaver, (2013) insisted that an act by the government to stimulate agriculture at scale pays off by increasing food production and rural incomes. With reference to World Bank the GDP growth originating from agriculture is about four times more effective in reducing poverty than GDP growth of other sectors and it can help reduce poverty for about 78 percent of the world's poor, who live in rural areas and work mainly in farming. With reference to Mogues et al (2012) there are significant potential and observable effects on health and nutrition resulting from agricultural public investments viz. (i) increased production for self-consumption, in the case of subsistence farmers; (ii) reduced (low) prices for net buyers of food (Fan & Breisinger 2011); and (iii) increased marketable output for agricultural producers who sell whole or part of their output, resulting from increased agricultural productivity which then ensures food access, better nutrition through greater calorie consumption and gains in dietary diversity and improved health and access to health services. It was found by Mogues (2012) that a 10 percent increase in the instability of total government spending on the agricultural sector causes, on average, a 0.36 percent decline in agricultural growth but a 1 percent change in agricultural expenditure as a share of GDP produces a 0.43 percent reduction in poverty.

Viewed from the primary data context, different situations were observed from the individual prospective beneficiaries of the government investment into the agriculture sector within the surveyed areas. There seems existence of a wide gap between the

secondary data from the respective governments and the actual situations at the lower levels. This was evidenced with the extent of involvement of the respective governments to support farmers and/or other stakeholders to get the basic requirements pertinent to their daily farming activities together with their levels of satisfaction with such support. More details about this matter already discussed in sections 5.3 to 5.5 of this chapter respectively.

CHAPTER - 6

Research Findings, Suggestions and Conclusion

6.1 Research Findings

With this chapter, the researcher unveils what he has come across during the entire research pertinent to relevant objectives. Results for this study are grouped into three categories namely (i) general findings; (ii) findings from secondary data; and (iii) findings from primary data. Findings from both sources (primary and secondary) were treated evenly in order to ascertain trends and current statistical statuses but to avoid biased (single source based) findings by putting in plain words the actual situations as observed from the respective prospected beneficiaries of the matter under the study within the case study countries and other relevant regions. They all draw the past and current status images pertaining to economical results from government investment on the case study sector. Various indicators of outcomes from government investment to the sector were considered from the individual stakeholders (beneficiaries), individual government economies and the international community.

I. Overall Objective: To ascertain the economic benefits resulting from injection of public resources to agriculture sector

- It has been proved from both secondary data and the literature of the economic theories that there is a positive correlation between public investment and agriculture sector growth, rural development and poverty reduction. However, the magnitude of returns from such investment to the sector is subject to the political will and commitment of a particular government towards it. In many cases government spending on agriculture has contributed substantially to employment, agricultural productivity, rural household income and consumption, food and nutrition security,

export earning, land development and education, health and industry sector - hence poverty reduction.

- It was noted from the secondary data that a 1 percent increase in total government expenditure on agriculture will increase the sector contribution to the national GDP by 1.03 percent in Tanzania and 1.28 percent in India whereas the number of undernourished people could fall by about 3.6 and 0.92 percent respectively.

- It was found by Cleaver, (2013) that an act by the government to stimulate agriculture at scale pays off by increasing food production and rural incomes. According to the World Bank the GDP growth originating from agriculture is about four times more effective in reducing poverty than GDP growth of other sectors and it can help reduce poverty for about 78 percent of the world's poor, who live in rural areas and work mainly in farming.

- It was stated by Mogues et al (2012) that a ten percent increase in the instability of total government spending on the agricultural sector causes, on average, a 0.36 percent decline in agricultural growth but a one percent change in agricultural expenditure as a share of GDP produces a 0.43 percent reduction in poverty. Thus, there are significant potentials and observable effects on health and nutrition resulting from public agricultural investments through: (i) increased production for self-consumption, in the case of subsistence farmers; (ii) reduced (low) prices for net buyers of food (Fan & Breisinger 2011); and (iii) increased marketable output for agricultural producers who sell whole or part of their outputs.

- It was observed that public investments on agriculture not only benefit the sector but also have indirect effects to almost all other nonagricultural sectors.
    - It feeds employees of almost all other sectors hence ensuring healthy work force for a continued production and growth.

- It provides raw materials to manufacturing sector. About 25 to 35 percent of all commodity inputs to some manufacturing industries come from agriculture sector while others like gametes, cigarette, tea and sugar manufacturing industries their commodity inputs depend mainly on the sector. Therefore a well financed agriculture sector ensures a year round production of these nonagricultural sectors.

- A well financed agriculture sector demands modern farming instruments, agrochemicals and equipments (fertilizers, tractors, harvesters and packaging and distribution equipment) all of which comes from the manufacturing sector this ensures market to their products.

It is therefore clear that there are economic benefits resulting from the government injection of public resources on agriculture sector.

Also spending into some other sector has an effect to the sector as it was found by Fan et al, (2012) that agricultural spending, education, and roads contributed strongly to agriculture sector growth.

II. Objective: To ascertain the role and responsibilities of government on agricultural development.

It has been proved by the literature of the economic theories that the primary responsibility for creating opportunities, legal framework and policies for the general development of the economy of the respective country and its individual sectors rests to the government. For this particular study, the governments are responsible for ensuring the development of agriculture sector. This is achieved through comprehensive planning, oversight and regulation, institutional control, institutional and organizational reform, setting up financial institutions, public undertakings and economic planning without forgetting transparency and accountability, responsiveness, strengthening linkages and setting strategic vision.

6.1. 1 Findings from secondary data

The researcher conducted a thorough analysis, discussion and interpretation of relevant secondary data that were collected from reliable local and international sources pertinent to the matter under study. And the following were the observations based on the aspects that were considered to be feasible indicators pertinent to the study respectively.

I. Objective: To ascertain the role and responsibilities of government on agricultural development

Creation and facilitation of opportunities or features supporting agriculture sector

- It was noted that there were no purposeful initiatives by both of the governments of the case study countries on creation and facilitation of opportunities or features supporting the sector.

- The number of agricultural stakeholders served by an individual agricultural expert within both countries is very high and unacceptable.

- It was further noted that the trends of the amounts of capital expenditure per ha of arable land were almost negligible compared to the importance of the sector.

- The number of qualified agricultural experts full time employed (FTE) in Tanzania and India has remained low and not proportional to number of agricultural stakeholders expecting their services respectively. Statistics proved that both countries are exposed to a problem of insufficient number of full time employed agricultural researchers.

- The current ratios of total expenditure of the sector per ha of arable land of $274 and $46 for India and Tanzania and capital expenditure per ha of arable land of $38 and $14 for India and Tanzania respectively are too minimal for the effective growth of the sector.

Fertilizer consumption trends and the current status

- The per ha consumption of fertilizer in India was almost 24 times of that in Tanzania in which it was almost negligible with an average of less than 10 kg/ha.

- The reason for such success of high consumption in India was noted to be investment in fertilizers manufacturing industries while their absence in Tanzania has caused high fertilizers importation and transportation costs which are always absorbed by the final consumer - farmers.

- Therefore, Tanzania has a great potential of increasing it productivity upon increasing the per hectare fertilizer consumption through investment in fertilizers manufacturing industries.

- However, there is a possibility of the more fertilizers to have been consumed in Tanzania but were not recorded due to the fact that most of the agrochemicals are being imported by private companies and there has been no clear government unit for tracking these chemicals. Therefore the reported figures do reflect those which pass on the eyes of the government.

Agriculture mechanization

- It was noted that mechanization of agriculture in Tanzania is still a big challenge facing majority of farming communities. Majority of farmers are still using hoes and animals for cultivating their farms.

- Reports on the current estimates and projections indicated that about 70 percent of Tanzania's total crop producing area is cultivated by the hand hoe, 20 per cent by ox-ploughs and leaving only 10 per cent for tractors.

- It was further noted that Tanzania was currently likely to have about 2 tractors per 1,000 ha of arable land compared to the global average of 19.7 tractors per 1,000 hectares.

- India has excelled well on this aspect. Reports indicated that the latest tractor density in India stood about 16 tractors for 1,000 hectares, as against the world average of 19 tractors and that in USA of 27 tractors per one thousand hectare of cropped area.

- The major factor of success for India in this aspect was investing into own tractor manufacturing industries.

- In Tanzania low producer prices, high cost of agricultural machinery caused by transportation and importation duties and farmers' inadequate capital due to lack of trade financing are among other setbacks on this aspect.

- This implies that Tanzania has a great potential of promoting agriculture mechanization through investment in tractor manufacturing industries within the country rather than importing them and establishment of special agricultural banks or financial institution to avail soft loans to farmers to purchase agricultural machinery.

- Other reasons were nature of the industry itself – seasonal which has always been leading into farm machinery to remain idle for much of the time is the common factor within both of the case study countries. This was mainly caused by dependence on rainy fed farming. Respective governments are also in a position to eradicate it through establishment of permanent irrigation schemes which will ensure full year farming.

Irrigation farming promotion

- The current situations of irrigation within the case study countries are varying depending on both the nature of land and government inventiveness.
- In India reports indicate that the rain fed area constitutes 70 percent of the entire cultivated area and about 35 per cent of cropped area in the country is irrigated although the ultimate irrigation potential is estimated at about 140 million ha.

- This implies a wide gap (about 15 percent) between that irrigation potential created and that being utilized.

- Further, the percentage of arable land equipped for irrigation within India has maintained a steady increase from 39.6 to 42.7 percent between 2004 and 2013 respectively (which is even above the world standard of 22.5) registering a growth of about 8 percent.

- In Tanzania reports indicate that by 2012 Tanzania mainland only had a total irrigation potential of 29.4 million ha but only 0.33 million ha about 1.13 percent in were currently under irrigation.

- The percentage of arable land equipped for irrigation in Tanzania has remained below 5 percent dropping from 2.1 to 1.4 percent between 2004 and 2013 respectively registering a downfall of about 33 percent. This may have been due to fewer resources allocated to this sub-sector and lack of specific agency to monitor and engineer it.

- It is just in 2014 the irrigation services have received extensive government consideration by constituting the National Irrigation Commission under the National Irrigation Act No. 5 of 2013 as an independent agency of the Government under the Ministry responsible for irrigation. By the year 2015-16 the commission was still under preparatory strategies.

- To step up from the current situation the newly established irrigation commission should be equipped with all necessary resources. India also should not relax but endeavor to have at least 50 percent of arable land equipped for irrigation.

- It can be said generally that India has devoted remarkable efforts and resources to promote irrigation for the sector development. Tanzania is lagging behind due to different reasons including fewer resources allocated to this sub-sector but also lack of

special agency to monitor and promote it resulting from inadequate government attention to the agriculture sector as a whole.

Post harvest losses management

- Research suggests that almost one – third of world's agricultural production is wasted and does not reach the final consumer. Both Tanzania and India are exposed to the problem though at different levels.

- In Tanzania According to the APHLIS, the losses are ranging from 20 to 40 percent against the world's standard of between 2 and 5 percent. According to TMP (2013) a total of 40 percent of the annual national production of cereals is lost due to post harvest losses in the country

- In India according to Kulakarni (2013) the level of post-production losses ranged from 5 to 15 percent in durables, 20 to 30 percent in semi-perishables and 30 to 40 percent in perishables all of which also were above the world's standard of between 2 and 5 percent respectively.

- This means the problem of losses after harvest within both countries is still high despite the nominal data of storage facilities availability respectively.

Agriculture Insurance

- Agriculture is restrained by vagaries of weather, pests, marketing and poor infrastructure that result into crop failure and adverse effects on the farmers' economic conditions respectively. Agricultural stakeholders within the case study countries are highly susceptible to both natural risks and economic risks.

- Agriculture insurance schemes are considered as the major risk transfer measures in the entire strategy of agricultural risk management. The poorest agricultural populations, whose livelihoods depend on agriculture, are considered to have a high demand for agricultural insurance since in most cases are least able to bear such risk.

- Reports indicate that the Government of India from time to time has been introducing different crop insurance schemes throughout the country to insure farmers against natural calamities and today over the last 10 years index insurance has grown to enable access to agricultural credit for over 22 million farmers, unlocking a value of 3.1 billion US$ in agricultural investment within the country with very minimal premium rates varying from 1.5 percent to 3.5 percent of sum assured being charged for food crops, while for horticultural and commercial crops, actuarial rates are charged and small and marginal farmers are entitled to a subsidy of 50 percent of the premium charged. This subsidy is shared equally between the Government of India and the States.

- In Tanzania as by December 2016 there was no any insurance scheme relevant to agriculture be it under the government or private sector. Reports showed that Tanzania launched the first trial service of insurance to small- holder farmers in January 2007 that was carried out within two districts in Manyara Region out of 114 districts by then. However, as this thesis is being submitted, there is no any update or relevant specific details related to the development of this trial service since then.

- It can generally be said that the nominal agricultural insurance information for India reflects visible government efforts to indemnify their farmers. In Tanzania, to the contrary farmers are exposed to total agricultural risks ranging from weather, pesticides and diseases, infrastructure, price fluctuation, limited access to markets and financial difficulties as there is no any agricultural insurance scheme to date.

Special Agriculture banking and credits

- It was noted that the National Bank for Agriculture and Rural Development (NABARD) is the India's special financial institute for agriculture and rural development in India established by Parliamentary Act in 1982.

- Reports show that the bank was set up with an initial capital of ₹1 billion ($15.87 million) and by 31 March 2015 the paid up capital, stood at ₹50 billion ($794 million) and a total of ₹12,700 billion ($2,016 billion) financial support to targeted beneficiaries has been distributed by March 2014.

- The charged lending interest rates were reported to be as low as between 4.5 to 10.5 percent depending on the nature of the credit.

- In Tanzania by early August 2015 the country had no functioning special bank or financial institution to facilitate transformation of the agricultural sector from subsistence to commercial farming.

- Reports showed that the newly established Tanzania Agricultural Development Bank Limited (TADB) was officially launched in August 2015 with a working capital of TSh 850 billion ($389 million). As by January 2017 it had only one branch in Dar es Salaam and the lending interest rates were as high as 16.1 percent compared to that of India of only 10 percent.

- It can be generally said that the age of the Indian government agricultural bank, its functions, nominal data about number of schemes financed, the working capital injected by the government and number of shares held by the government reflects their perceptible efforts to prosper the sector growth through this aspect.

- In Tanzania, as by late 2015 farmers had no any special government financial institute to support their efforts on agricultural activities as there was no any agricultural financial institution.

- The functions of the newly established bank according to TADB were:
    - Coordinating government intervention and interface with other stakeholders in the field;
    - Developing suitable policy, legal and regulatory frameworks for the sector;
    - Guiding the development of the agricultural sector; and
    - Gathering relevant information about the sector and monitoring the performance of the sector.

Agricultural Marketing

- It was observed that collection and spread of market information in India is the duty of the government through the directorate of Economics and Statistics, Ministry of food and agriculture.

- Actual buying and selling of the agricultural products takes place mainly in primary and secondary (wholesale markets) and rural periodic markets commonly known as *haats* spread all over the country. The country has around 7,000 regulated markets and 22,000 rural primary markets.

- Reports show that it owns one of the world's largest fruit and vegetable project – Mother Dairy Fruit and Vegetable Ltd with an annual capacity of 120,000 tones and a chain of 300 retail and the world largest fruit and vegetable market with 76 acre yard and annual capacity of 460,000 tones with a capacity of over 15,000 tones of fruits and vegetables daily connecting about 100,000 people for trade daily all in Delhi.

- The country also has a special Agricultural Marketing training institute - The National Institute of Agricultural Marketing for conveying training to farmers on marketing management.

- In Tanzania it was noted that it is the duty of government to gather and extend the market information through the National Bureau Statistics (NBS).

- However reports show that farmers' access to agricultural marketing is adversely constrained by lack of marketing structures, poor linkages within the marketing, processing and production chains, poor market-orientation and inadequate processing facilities leading to high levels of produce wastage.

- Agricultural value addition is also still a major problem. Majority of crops in the country are marketed in their raw forms, losing opportunities for higher earnings and generating employment due to various constraints facing the agro-processing industry.

- To date there is neither specific price regulatory board/committee for grains and horticulture produce nor special Agricultural Marketing training institute.

- Generally, the Indian government efforts to address the agricultural marketing are more visible. Nevertheless, the gap between the place of production and that of consumption is still wide.

- In Tanzania conversely, agricultural marketing extension services and value addition have not been emphasized properly by the government.

Food security and self sufficient statuses

- It was noted that Tanzania has been lagging behind India in all four major cereal farm produce (wheat, maize, beans dry and beans green) for the period of the last fourteen years up to 2014.
- For the general cereal production, India has maintained a steady rate of production increase from 2,447 kg/ha in 2006 up to 3,122 kg/ha in 2015 registering a growth of about 28 percent while in Tanzania it was increasing in a fluctuation way from 1,327 kg/ha in 2006 up to 1,790 kg/ha in 2015 respectively registering a growth of about 35 percent.

- Reports indicate that Tanzania has recorded a high average value of food imports (about 29 percent) over total merchandise exports for the last eighteen years up to 2010 compared to India whose value was 5 percent during the same period.

- Domestic Food Price Volatility in Tanzania is as high as twice that of the world's standard. This means foods are less accessible or affordable in Tanzania compared to her counterpart.

- Reports indicate that the percentages of undernourished populations within Tanzania and India by 2015 were 32.1 and 15.7 respectively. The rates are high and unacceptable.

- Statistics by NSSO suggest that India has counted tremendous achievements by dropping the portion of households that had nothing to eat from 17.3 percent in 1983 to 2.5 percent in 2004-05.

- Data by NBS in Tanzania indicated that for the period of twenty years from 1991-92 to 2011-12 the country has attained a notable plunging of the percentage of its population below food poverty line from 26.1 to 9.7 respectively.

- In view of the Hunger Index for the last two decades, both countries have performed well. While it has dropped from 42.1 to 28.4 for the period between 1992 and 2016 for Tanzania, it has dropped from 46.4 to 28.5 during the same period in India

- However, both countries have not done well in the general food security aspect. Despite their lower hunger indexes score, the number of hungry people within their jurisdiction is still high and unacceptable. Tanzania is highly subjected to low cereal yield, leading into high foods importation rates together with high domestic food price volatility index as compared to her counterpart India. On the other hand, reports indicate that the India's number of undernourished people and the malnutrition levels are as twice as much of the world standards and some countries in Africa.

II. Objective: To ascertain the government exertion on proper management of public resources allocated to the sector and compare priorities for public spending between capital and recurrent expenditure

Management of funds allocated to the sector

- Huge amounts of approved funds for agriculture sector have been spent on recurrent expenditure for activities like conferences and seminars, sitting allowances, overtime, motor vehicle fuels, etc, that have no direct impact to individual stakeholders and the sector as a whole rather than benefit a few individuals especially government officials in offices leaving very minor portions being allocated to the capital expenditures which are deemed to have not only direct but also visible impact to individual stakeholders and the sector as a whole.

- For the period of last ten years up to 2015 the average recurrent expenditure as a portion of total funds allocated to the sector stood at 58 and 89 percent for Tanzania and India respectively leaving only 42 and 11 percent for capital expenditure respectively.
- This means governments have not managed properly public funds and/or resources allocated to the sector for its effective growth. Instead, the sector has been used as seepage for extracting public resources for extravagant expenses for some few government officials with no remarkable returns to the general public.

III. Objectives:

i) To analyze the trends of budget allocation to agriculture sector and the current percentage of agriculture funding as a part of total annual budget.

ii) To analyze the trends of disbursement of budgeted and approved funds to the agriculture sector from central government

Budgetary Allocation Trends to the Agriculture Sector in study areas

- The percentage of budgetary allocation trend to the agriculture sector as a portion of total government expenditure within both countries is not promising. Although India has done better as compared to Tanzania, neither of them has attained the one - tenth of the national expenditure to the sector which is internationally recommended.

- This means there were no specific policies and/or priorities within both of the case study countries for funding the sector rather than political drives because as it was observed that the maximum portions of funds allocated to the sector as compared to the total national expenditure used to be attained either prior year to or during the general election year or both but could drop suddenly in the subsequent years.

Disbursement of budgeted and approved funds to the Agriculture sector

- It was observed that even such small amounts of funds budgeted and approved for the agriculture sector have not been released from the central governments respectively.

- For the period of last eight years up to 2015 the average of budgeted and approved funds but not disbursed from the respective central governments stood at 12 and 71 percent for Tanzania and India respectively. This situation not only has been limiting the implementation of the planned activities but also the sector growth.

- It was therefore concluded that there is no correlation between verbal and political government commitment to promote the sector growth and the actual budgetary allocation and funds disbursement trends.

- However, several reasons were related with this situation including inadequacy of funds, dependence on development partners but the most is less consideration of the sector by the respective governments.

IV. Objective: To evaluate the trends of public investment to the sector pertinent to its respective contributions to the national GDPs.

Contribution of Agriculture Sector to the National GDP of the case study countries

- More than one-third of the Tanzanian economy is depending on agriculture sector. The sector has registered an increase of more than 3 percent of contribution to the national GDP between 2006 and 2015 respectively compared to the service sector that has registered a downfall of more than 8 percent between the same period. This means the sector plays a great role into the national economy growth. Therefore the Tanzanian agriculture sector needs much attention and promotion for its effective and sustainable growth.

- The agriculture sector contribution to the Indian National GDP has remained less than 20 percent registering a downfall of more than 5 percent between 2006 and 2015 respectively compared to the service sector that has registered an increase of more than 4 percent between the same period.

- It was observed that the Indian economy is transforming from agriculture to the service with a maximum of about 4 percent annual growth. However, based on its current contribution to the national GDP, the agriculture is still an important sector to the national economy as it sustains more than 80 percent of the country's population.

Public investment trends to agriculture sector pertinent to its respective contributions to the national GDP

- The agriculture sector has not received adequate consideration pertinent to its respective contributions to the national GDP of the respective case study countries. It has remained a less considered sector despite its vital donation to their economy.

- In India the agriculture sector contribution to the national GDP has been decreasing with time from 18.8 to 17.8 percent between 2006 and 2015 respectively meaning that the Indian economy is currently transforming from agriculture to other sectors. However, the amounts of funds and other resources injected to the agriculture sector as a portion of the total annual government expenditure has remained below ten percent ranging from 6.3 to 7.6 percent between 2006 and 2015 respectively.

- In Tanzania it was noted that the agriculture sector contribution to the national GDP has been increasing with time from 28.8 percent in 2007 as a minimum up to 33.3 percent in 2013 as a maximum respectively during the same period with an average of about 32 percent. This can be concluded that about one-third of the Tanzanian economy is controlled or determined by agriculture sector.

- To the contrary, the amounts of funds and other resources injected to the agriculture sector as a portion of the total annual government expenditure during the same period were not in line with its respective contribution to the national GDP. They have remained as low as between 5 percent to 7 percent respectively.

- Neither of the case study countries has attained the one-tenth of the total annual government expenditure to be allocated to the sector during the same period which is internationally recommended.

- This was further concluded that the amounts to be allocated to the agriculture sector within both countries could be determined by the political tactics rather than the specific country policy for promoting agriculture sector because it was observed that all the highest or maximum rates of budget allocation to the agriculture sector within

both countries have been attained either prior to or during the general election years but could decline immediately after elections respectively.

- Therefore, public investment trends to the sector have not considered its respective contributions to the national GDPs by both governments of the case study countries.

6.1. 2 Findings from primary data

Despite the good nominal data provided by the officials of the respective government and their institutions, the situations were different when I went to the field and approached the individual prospective beneficiaries. The following is a summary of farmers' outcry concerning to farming activities at their village level. They explain the current actual status of their governments support to the sector through various aspects viz. financing, land acquisition and development, agricultural inputs, mechanization, supply of fertilizers, irrigation promotion, post harvest management, agriculture insurance, marketing, transport facilities, etc.

I. Objective: To ascertain the role and responsibilities of government on agricultural development

Through primary data, this objective was tested by considering the following aspects based on the individual experience and/or perceptions of the prospected beneficiaries about the government involvement and commitment to ensure their smooth availability from both of the case study countries respectively.

Land survey, acquisition and ownership:

- Most of farmers within the case study areas own small pieces of land. On average 15 percent own land less than 1ha, 40 percent had land pieces of up to 2ha while about 41 percent confessed to own pieces of land bigger than 2 ha. This depicts that agriculture within both countries is still dominated by small (subsistence) farming.

- However; most of them do not have land ownership certificate or title deeds as they are not surveyed. The situation that has made them to lack not only ownership evidences but also they can't use them to seek financial loans from financial institutions as they do not conform to be used as collateral.

- Among the reasons for such situation was high land survey costs and unnecessary bureaucracy. It was noted that land surveying was a long process that could cost someone two to three years or more. This has made majority to consider it as resources and time wastage.

Supply of Subsidized agricultural inputs

- **Seeds and agrochemicals:** Several villagers in Tanzania confessed to have never got any agricultural subsidies although they have been applying since the program started but their applications never been replied.

- A very minor portion of farmers use seeds from approved distributors. The majority of farmers (about 63 percent) depend on their locally own reserved seeds (inputs) and from their colleagues (about 42 percent) both of which are not appropriate for high crop yielding.

- Those few who get it, they said the inputs have been supplied late. Seeds and fertilizers for example could arrive at their field during the weeding period the situation that makes them useless.

- Almost all farmers in India (about 98 percent) depend on seeds (inputs) from approved farm implement distributers delivered on time. This implies a likelihood of high crop yielding from their farming.

- **Fertilizers:** despite of the nominal information from the government which indicate that India is owning more than 50 large size fertilizers plants manufacturing a wide

range of nitrogenous, phosphatic and complex fertilizers, Indian farmers confessed to have been facing difficulties in acquiring such important agricultural implement.

- It was noted that when required, artificial or chemical fertilizers were always not readily available from open market, instead they could only be available in the black market at very high prices instead of being available at respective *taluka* and/or cooperative unions.

- It was further noted that since last two years by august 2016, artificial or chemical fertilizers manufactured by the government companies viz. IFFCO, RFC, GNFC, etc were not available at the time of requirement. According to farmers, they were directly bought by some few traders who then sell it at high prices in the black market.

- In Tanzania more than 90 percent of the fertilizers used are being imported by private companies with profit motives. Therefore importation duties and transportation costs are being absorbed by the final consumers – farmer with minor support of their government.

Fertilizer consumption

- Majority of Indian farmers (84 percent) fall into a group who consume fertilizers between 101 and 1,000 kg/ha while about 10 percent consumed above 1,000 kg/ha as compared to Tanzania in which only 21 percent consume fertilizers between 101 and 1,000 kg/ha while only 5 percent consumed above 1,000 kg/ha. This means more than 70 percent of Tanzanian farmers consume less than 100 kg/ha.

Transport infrastructure

- In Tanzania poor transport infrastructure has remained one among the major obstructions of the agriculture sector development.

- According to farmers, it affects the entire farming cycle, by hindering them from getting farming inputs on time and at affordable prices but also delaying transportation

of their farm produce to the nearby local markets and or global markets. Those a few businessmen who dare to bring inputs to nearby local retail shops do sell them at high and unaffordable prices but in turn, those a few traders who dare to approach their villages to purchase their farm produce have always been taking them at non remunerative prices.

- For example apart from being located 4km away from the Tanga - Lushoto District main road, farmers in Boheloi village have been suffering from lack of markets for their farm produce for several years due to poor infrastructure which is not passable throughout a year.

- In India due to non availability of reliable *pucca* roads, during monsoon most of farmers' tractors get capped into the extremely wet mud the situation that not only delays farming activities but also leads to additional repair and maintenance expenses. Such poor condition of pucca hinders them from transporting their produce from farm yards to nearby local markets.

Irrigation facilities

- Year round farming can only be achieved through irrigation farming. However, it has a disadvantage of high initial costs.

- About four out of five interviewed farmers in India reported to have had practiced irrigation farming. However, in most areas there are no natural canals; as a result, irrigation depends on both public and/or individual bore wells in which current electricity is limited to 8 hours a day only. This has been dragging them back from achieving their targeted objectives. It was noticed that sometimes crops were drying due to lack of enough water caused by power supply scheduling. Farmers were requesting to be increased to at least 18 -20 hours a day.

- In Tanzania irrigation farming has not received attentive deliberation from the government. Despite the varsity of natural water sources all over the country, farmers still undergo rain fed farming.

- Those willing to drill their own bore wells still are dragged back by high purchasing and running costs of generators and fuel respectively since most of the rural areas are still not electrified.

Extension officers and capacity building

- Generally, more than 95 percent of all farmers within the case study countries are illiterate, some among them being with no passionate to practice anything new. Therefore regular and close supervision of their daily farming activities is necessary.

- However, they rarely get it as a result of limited number of agricultural extension officers, those few available are blamed they do not visit villages to share any latest technological information, but officers themselves say they fail due to several reasons including poor infrastructure, locations of some farmers, inadequate transport facilities and the number of farmers to be served by a single officer.

- Capacity building through regular training on modern farming is also necessary. Unfortunately most of them could not attend them due to the associated costs and/or lack of adequate relevant information. As a result, they have remained confined with primitive means of farming which in turn is associated with low productivity.

Agriculture Financial facilities

- In India, special agricultural banks and financial facilities are available. More than 50 percent of Indian farmers are boosted up by special agriculture banks and other financial institutions. Nevertheless, most of farmers never thought of seeking loans and/or other financial services from banks due to various reasons including lack of

adequate and relevant information. They believe that there is no intermediate bank(s) that provides loans to cooperative societies and individual farmers.

- In Tanzania as by the mid of 2015, there were no any formal or special agricultural banks and financial facilities. Those who could dare had to approach the commercial banks whose interest rates have been always complained about to be too high. This has resulted to less than 5 percent of Tanzanian farmers depending on commercial banks. This means agricultural activities in Tanzania are highly exposed to individual farmers' informal and uncertain financial sources.

- Majority of farmers within the case study areas depend on informal and uncertain (own) financial sources to facilitate their farming activities. This is due to the great gap between the two parts. Farmers do hesitate to go to banks for loan seeking due to high loan interest rates while banks do not trust those few who go there for loan seeking due to uncertainties facing agriculture within the country.

Agriculture mechanization

- In Tanzania farming is dominated by hand hoe and plough for about 78 and 31 percent respectively. A few farmers have managed to purchase power tillers and a very minor portion of them could manage to acquire tractors. Non affordability of the equipment and low support by the government were the major reasons.

- The situation is different in India; about 98 percent of farmers are using mechanized instruments (tractors) for their farming activities. And more than 3 percent are using power tillers or animal dragged hoes leaving less than one percent using hand hoe.

Public Storage and preprocessing facilities and Post Harvest Losses Management

- In India despite the good number of storage facilities indicated in the government nominal data, only 65 percent of the interviewed respondents within the surveyed areas confessed availability of storage facilities (warehouses) for farm produce within

their local areas. Because of that, most of farmers used to store their produce haphazardly in their limited spaces within their individual living houses.

- In Tanzania the number of public storage facilities is still limited below 1,500 throughout the entire country. And among those few available some are not accessible as they had been leased for other different private use.

- Only 20 and less than 10 percent of farmers in India and Tanzania respectively who confessed the availability of public storage facilities within their local areas agreed to have used them at least once.

- Lack of preprocessing facilities has posed a serious effect to farmers of both countries. Most of farm produce are seasonal but very perishable. Their seasonal – bulk production has always been leading them into lack of competitive rates on the produce followed with price falls resulting into financial losses.

- Post harvest losses are highly experienced by Indian farmers. About 78 percent of farmers experience losses of more than 10 percent of their produce per season.

- In Tanzania the problem is spread to all levels from less than 5 to more than 10 percent of the produce per season. More than 25 percent do not experience the problem. This doesn't mean they have got the solution, but because of their nature, i.e. subsistence farming which does not sustain them to the next harvesting season.

Farmers Capacity building on modern faming /agriculture

- More than an half (51 percent) of farmers in India had ever attended capacity building related to modern farming at least once while less than an half (44 percent) in Tanzania have got the same.

- Funding sources for such trainings in India were dominated by self sponsorship (91 percent) and government sponsorship (79 percent) respectively. In Tanzania funding

sources for the same was dominated by Development Partners sponsorship (57 percent) leaving the government contributing about 48 percent for the same respectively. This depicts how agricultural growth promotion in Tanzania is highly dependent on DP's compassion.

Insurance

- Crop failure, damage and loss depend on climatically changes that are not easily predicted by a normal farmer whereas loss recovery is always difficult.

- Despite the good nominal data of the Indian government about agricultural insurance within the country, about 99 percent of the interviewed respondents confessed to have encountered crop failure due to different reasons at different periods but had never heard about the agriculture insurance and did not know how it works.

- In Tanzania there was no, and as this thesis is being submitted, there is no any agricultural insurance scheme to date. Instead there exist general insurance companies only who hesitate to covers farmers due to several uncertainties associated with this sector. This situation has always left Tanzanian farmers exposed to total losses in case of any calamities.

Marketing infrastructure and farm produce exportation

- Marketing of the agricultural produce is an important aspect in the farming cycle, it absence which may lead into total loss. However, survey results indicate that it has not been emphasized within both of the case study countries.

- Farmers within both the case study countries confessed to have no freedom to sell their farm produce to the market due to different reasons including lack of perfect information relevant to their produce, price changes and poor infrastructure to ferry their produce to the markets, poor storage facilities, which could allow them to sell them later on demand when prices go up.

- More than 76 percent of farmers in India do not sell any portion of their farm produce per season while only 16 percent do dispose up to an half their produce per season.

- In Tanzania farmers have been even experiencing government barns from selling and or exporting their farm produce on the grounds of protecting them from food and nutritional insecurity that would have been resulting from sale of all of their food balances.

- About 46 percent of farmers in Tanzania do not sell any portion of their farm produce per season but more than 50 percent do dispose their produce from 5 up to more than 50 percent per season. Lack of storage facilities, post harvest management skills were among the key reasons.

Crop losses, causes and mitigations or ways used to regain

- At least eight farmers out of ten have ever experienced crop losses at least once in a period of last three years regardless the cause(s) within both countries.
- The most affected group was that of small farmers whose income ranges between $100 and $500 with more than an half of respondents within both of the case study countries.
- At least eight and nine farmers out of ten in Tanzania and India respectively ever encountered climatic causes of crop losses. This means majority of farmers within the case study countries depend mainly on uncertain rain fed farming.
- Economic factors were related to financial inability to: afford certified high yielding seeds, adequate quantity of fertilizers, appropriate farming equipment, storage material, pesticides, transportation and marketing facilities.
- Therefore, agriculture activities within both countries are highly stalled by climatic and economic factors.
- Neither of the farmers within the surveyed areas ever enjoyed agriculture insurance nor government subventions as a risk transfer.

- At least five farmers out of ten in India could secure loans from financial institutions (Special Agricultural Banks) to finance their farming, the service which does not exist in Tanzania. However, less than 5 percent of Tanzanian farmers confessed to have approached commercial financial institutions for the same service.
- While at least 3 farmers out of ten of those ever experienced crop losses in India could not regain their normal economical status, In Tanzania it was even doubled. They decide to changes into different other issues like sole trading, casual labor, sale and/or lease of their pieces of land.

II. Objective:

i) To ascertain the level of government support to agricultural stakeholders in all steps of crop farming cycle; and

ii) To evaluate the level of stakeholders satisfaction with such support

Government support on land survey and acquisition

- Neither of the farmers in Tanzania ever enjoyed government assistance on land survey and acquisition. This means farmers are exposed to a total risk of losing their pieces of land due to lack of relevant legal documents to verify their ownership.

- All farmers in India confessed availability of such service from their government. However, not all farmers were satisfied by such service. About 81 percent indicated to have been satisfied leaving about 17.6 being extremely dissatisfied.

Government support on inputs - seeds and agrochemicals

- The government support on inputs - seeds and agrochemicals to farmers is almost negligible within both of the case study countries with 15 and 1 percent for Tanzania and India respectively.

- More than 90 percent of those who receive the service in Tanzania were dissatisfied compared to 33 percent of India.

Government provision of agricultural subsidies

- At least 7 and 8 farmers out of ten in India and Tanzania have ever enjoyed the government support on agricultural subsidies to farmers respectively.

- More than 67 percent of farmers in India were satisfied with such service compared to less than1 percent of Tanzanian farmers.

- More than 70 percent of farmers in Tanzania were unhappy with the service compared to about 19 percent of Indian farmers. This means the Tanzanian government support to farmers on agricultural subsidies is too nominal and/or political.

Government support on Electricity

- The government provision of electricity service was in a converse relationship with about 9 out of ten Indian farmers having enjoyed the service, while in Tanzania about 8 out of ten farmers have never enjoyed the same.

- More than 67 percent of Indian farmers were happy with the service against more than 98 percent of Tanzanian farmers who were extremely unhappy with the service compared to about 18 percent of Indian farmers.

- This means the Tanzanian farmers are highly exposed to agricultural risks caused by lack electricity such as high irrigation costs, lack of storage and pre cooling facilities and limited value addition - sale of unprocessed farm produce.

Government support on Mechanization

- The government support on agriculture mechanization in India was 60 percent compared to Tanzania at 36 percent respectively.

- More than 45 percent of Indian farmers were happy with the service compared to less than 5 percent in Tanzania leaving about 90 percent of Tanzanian farmers unhappy with the service.

Government support on Irrigation

- About eight and one out of ten Indian and Tanzanian farmers respectively reported availability of the government support on irrigation farming.

- About 55 percent of farmers in Tanzania who receive the service were satisfied with it compared to about 78 percent of Indian farmers leaving about 44 percent of Tanzanian farmers being extremely dissatisfied with the service compared to less than 7 percent in India respectively.

Government support on crop loan

- The Tanzanian government does not provide any crop loan to their farmers.

- At least 65 percent of farmers in India ever received the service from the government with more than 98 percent being satisfied with that service.

- This means the possibility of an Indian farmer to skip farming just because of lack of normal farming equipment is less than 2 percent.

Government support on crop and/or agriculture insurance

- The Tanzanian government does not provide any crop and/or agriculture insurance to their farmers.
- Only less than 2 percent of Indian famers ever received crop and/or agriculture insurance service. On the other hand, the government information about agriculture insurance in India are too nominal and/or political if such service has not been there for some special group of agricultural stakeholders.

- Thus, almost all farmers within both countries are highly exposed to total loss in the instance of natural calamities or any other issue beyond their prediction.

- The satisfaction level of those getting the service in India was as high as more than 70 percent.

Government support on Horticulture Promotion

- Four out of ten Indian farmers ever received the government support on the horticulture promotion.

- Neither of Tanzanian farmers ever enjoyed any government support on horticulture promotion. This implies that horticulture in Tanzania is currently conducted on self initiatives of individual farmers.

- Among those who were receiving such service in India, more than 60 percent were satisfied with the service meaning that the possibility of improving the farmer's economy through horticulture is very high.

Government support on Warehousing services

- About 65.2 and 20.1 percent of farmers in India and Tanzania respectively confessed the availability of the government support on warehousing services within their local areas.

- Almost all (98 percent) of Indian farmers receiving the warehousing service were satisfied with it compared with only 44.6 percent of Tanzanian farmers who confessed the same leaving more than 50 percent of Tanzanian farmers who ever received such service being extremely unhappy with it.

Government support on Post Harvest Losses Management

- Six farmers and one farmer out every ten in India and Tanzania respectively had ever enjoyed the service of government support on PHL management.

- However, almost all respondents within both of the case study countries (98 and 96.7 percent) for India and Tanzania respectively were dissatisfied with it.

Government supports on Farm produce Processing and value addition

- Both governments do not provide support on farm produce processing and value addition to their farmers.

- This means smallholders of agriculture are highly exposed to the risk of distress sales of their farm produce instantly during or after harvest season, in law form and at non remunerative prices due to lack of adequate technologies and facilities for post harvest handling, storage and processing but later to buy the commodities at much higher prices. The situation has effects in two tires: (i) reducing their income from sale of their farm produce; and (ii) dragging most of their resources for purchasing food and other commodities from the market at very high prices.

Government support on transport infrastructure

- Transport infrastructure is available at the levels of 93.4 and 83.9 percent for India and Tanzania respectively.

- However, almost all Tanzanian respondents (99.8 percent) who confessed availability of such service were extremely unhappy with it. In India about 46 percent confessed to have been satisfied with the service leaving more than 50 percent of the respondents being dissatisfied with the service.

Government support on marketing infrastructure

- The Tanzanian government does not provide support on marketing infrastructure services to their farmers leaving majority farmers highly exposed to the risk individual fraudulent and/or unfaithfully middlemen who are always there just to take advantage of farmers' sweat.

- Three out of ten Indian farmers had ever enjoyed the government support on marketing infrastructure services within their respective local or nearby areas and all confessed to have been enjoying the service.

Government support on special agriculture banking and credits

- The Tanzanian government does not provide support on special agriculture banking and credits services to their farmers.

- This means that the financing of the agriculture for a Tanzanian farmer is subject to self individual efforts to seek financial credits from unreliable individual money lenders, creditors and private commercial banks and institutions most of which do not accept them because of their nature (termed as high risk borrowers) but also the interest rates charged are always high which cannot be afforded by majority smallholders.

- On the other hand, more than 68 percent of respondents in India confessed to have ever received the service out of which more than 95 percent of respondents indicated to have been satisfied with the service.

Government support on capacity building

- Both governments of India and Tanzania do provide support on capacity building to their farmers respectively. However, the current magnitude of stakeholders covered by such service does not suffice the demand of majority because the portion of respondents covered by such service was as less as 39.9 and 44.9 percent for India and Tanzania respectively.

- Further, majority among those a few who receive such service (85 and 99 percent) for India and Tanzania respectively indicated to have been dissatisfied with it. About 36.8

percent of Tanzanian farmers indicated to have been tremendously dissatisfied by the same.

Government support on export facilities

- Both governments do not provide support on farm produce exportation to their farmers.

- This can further be interpreted that majority of smallholders of agriculture within the case study countries are either practicing subsistence farming meaning that they have nothing to export or they have been marginalized by their respective governments.

- However it was realized that majority were restrained by both - illiteracy on marketing and exportation and government bans from selling their farm produce out of their local areas where there are markets.

Government support on agriculture technology

- The government of Tanzania does not provide support on agriculture technology services to their farmers. This means that modern agriculture for a Tanzanian smallholder is subject to self individual efforts to seek consultancy and advanced farming equipments from private institutions.
- More than 40 percent of respondents in India confessed to have ever received the service but more than an half (68 percent) of respondents were unhappy with the service leaving only less than 30 percent who confessed to have been enjoying the service.

Government support on timely delivery of agriculture inputs

- The government of Tanzania is not concerned with timely delivery of agricultural inputs (particularly seeds) to their farmers.

- Seeds were always being delivered late during weeding period the situation that made them useless.

- This means that a Tanzanian smallholder of agriculture has been exposed to the risk of using low yielding seeds which they have been acquiring from informal sources among themselves and or uncertified farm implements distributers the situation that has restrained most of them from achieving their targeted objectives of improving their agriculture productivity.

- More than 45 percent of Indian farmers confessed availability of government support on timely delivery of agriculture inputs (seeds) services within their respective local areas out of whom more than two-third (82 percent) of them were enjoying the service. About 16 percent who confessed to have been unhappy with the service.

Government support on First Call Centers

- The government of Tanzania does not provide support on first call center or kiosk services to their farmers.

- First Call Centers are schemes full financed by governments in most countries to where farmers do dial the toll-free numbers and get their queries answered by the respective expertise. This means farmer's queries (except those complex one that need physical appearance of an expert) are solved while he is at his farm yard proceeding with production activities and the expert in his office serving many others.

- To the contrary, all Tanzanian smallholders of agriculture are subjected to pay a physical visit to the respective offices which are always afar from their local residence or to wait until the respective extension officer makes a normal visit to his area which do not happen regularly.

- Less than 20 percent of Indian respondents confessed to had ever received the service leaving more than 80 percent of Indian smallholder farmers subjected to a situation of

Tanzanians to pay a physical visit to the respective offices which are always afar from their local residence or to wait until the respective extension officer make a normal visit to his area which do not happen regularly.

- More than 90 percent of respondents who confessed availability of government support on first call centre services were satisfied with the service leaving only less than 7 percent who confessed to have been unhappy with the service.

III. Objective: Identification of the problems faced by governments in agricultural public spending in the case study areas.

Several factors were mentioned and/or observed from the field as the barriers pertinent to implementation of public investment for agriculture sector within both of the case study countries. The huddles have a wide range of spread varying from individual to institutional but also from local to international levels respectively. The following are some of the observed major obstructions faced by stakeholders in implementing public investment for the effective growth of the agriculture sector:

At the individual farmers level

- Poor technical knowhow among most of the prospective individual beneficiaries on modern farming and value addition caused mainly by lack of regular capacity building.
- Poor economic condition of the village community limiting them to pay valuable participation on project implementation. For example in Tanzania it is a policy that any project brought to their local area either by the government par se or DPs the prospective community (farmers) are required to contribute 5 percent of total project costs before its commencement. This has been causing unnecessary delays of projects implementation as some groups/village councils take longer to contribute.

At the Local government level

- Untimed disbursement of funds for implementation of approved agricultural projects from respective central governments. It was noted that in most cases funds are

disbursed during the late days of the fourth quarter of the respective financial years and they are supposed to be spent within such financial year, whatever remains must be reimbursed back to the central government as on the day of the closure of the business of the last day of respective financial year.

- Unnecessary bureaucracy - in some cases the agriculture sector funds goes through many hands before it reaches the final intended beneficiaries. This attracts not only unnecessary delays but also corruption and embezzlement of public funds by some dishonest public servants.

- Contradictory priorities between development partners and the prospective beneficiaries of some projects. Sometimes project financiers do come with their own precedence on particular projects which in most cases are not in line with those of the beneficiaries - farmers.

- Inconsistency of government policies on the agriculture sector; it was noted that some of the policies related to the sector have been regularly changed by government executives. This has been causing multiplicity of projects without sufficient funds to finance them simultaneously.

- Political inquisitive for personal gain; this according to officials at LGA's there were a high interference of politicians particularly councilors in all activities related to implementation of funds be it from central government or development partners by denying professional advices with personal gain motives.
- Mismanagement and/or embezzlement of government subsidies (seeds, fertilizers, pesticides, etc) some dishonest government staff and/or approved distributers could collude with some businessmen whereby subsidized farm input could be released to them and they sell (instead of distributing them) the same to farmers at higher prices than market prices.

The situation was even worst to Indian farmers; according to the respondents, chemical or artificial fertilizers are only available in the black market at very high prices instead of being available at respective *Taluka* and cooperative unions. In some areas it was noted that for more than two years, chemical/artificial fertilizers manufactured by the government companies viz. IFFCO, RFC, GNFC, etc were not available at the time of requirements. They were directly bought by some few traders who then sold them at high prices in the black market.

- Untimed delivery of farm inputs distributed by the government to farmers. Farming in most of rural areas is a timed and seasonal commotion as they depend on uncertain rainfalls. In most areas farm inputs were reported to have been distributed late. About 78 percent of respondents in Tanzania confessed late receipt of subsidized seeds and fertilizers. They could reach farmers during the weeding session.

- Farmer's conservativeness from changing their mind sets for adopting new agricultural technologies; in some cases it happens when farmers resist government proposals for changing from their indigenous means of farming.

At the regional and/or state level

- Lack of project management awareness; in some occasions, some projects are being initiated by the central governments, just to instruct states and/or regions to implement them without imparting them with relevant knowledge on how to implement and manage the same.

- Inadequate agricultural research for launching new projects; this is caused by inadequate funds allocated to the lower levels both state or regional and local governments from the central governments respectively

At the National level

- Inadequate funds to finance the sector; in most cases development countries run their government in a discrepancy of funds the situation that has made them dependants of uncertain DPs' support for the same.

- Inadequate number of agricultural experts both researchers and extension officers; the number of skilled agricultural officers within the field is very limited compared to the actual demand.

- Corruption and embezzlement of public funds; this occurs at all levels of the government by some dishonest public servants.

At the global level

- Climate change resulting from global warming has posed a major obstruction on the international community on promoting the agriculture sector. Some projects could not be implemented as planned due to long sunny periods (droughts) followed with long rainy periods (floods) that in most cases destroy even the already existing infrastructures.

- Agriculture the less considered sector in the development era: Both the donors and developing countries seem to have not taken keen actions relevant to promoting the sector. According to Sigh (2011), despite the fact that three out of four of the world's poor live in the rural areas, there has been no clear evidences from the developing countries on how they invest on rural development. Sigh added that in SSA for example where agriculture is a key source of food security, employment, income and export earning only 4 percent of the public investment goes to the sector. Most of the development partners agree that the sector is the fundamental factor for both socio economic growth and poverty alleviation, while some politicians even dare to call the sector the mainstay of their countries' economy. Unfortunately, this has remained a theory rather than putting it into relevant actions/treatment accordingly.

- With reference to WB (2008), the agricultural and rural sectors have suffered from neglect and underinvestment over the past 20 years. Thus, while more than 75 percent of the world's poor live in rural areas, a mere 4 percent of official development assistance goes to agriculture in developing countries.

- All these were evidenced with data from the surveyed areas. While the sector has maintained an average of 32 and 18 percent contribution to the national GDPs for Tanzania and India during the period of ten years up to 2015, to the contrary an average of 6.5 and 6.9 percent has been recorded as the portion of the total national expenditure allocated to the sector for Tanzania and India respectively during the same period.

6.2 Suggestions

Both countries have great potentials of promoting the agriculture sector and improve productivity which in turn may result into employment, increased local income, foreign exchange, improved food and nutrition security of their populations and therefore ensure growth of other sectors through assurance of food and nutrition security to their work force, raw materials to manufacturing industries together with provision of reliable market to their products. However, such potentials have been stalled by different factors as discussed in the findings. In view of that, I suggest the following factors to be considered by all stakeholders involved into the sector for its effective growth:

1) Political will by respective governments – in most cases the political policies and decisions towards the sector promotion have been more speculative rather than being practiced. Let the government executives mean what they say on political platforms

about the sector and put into actions all the local and international resolutions towards the sector promotion.

2) Comprehensive planning, oversight and regulations – in collection should be in place for enabling a streamlined way of promoting the sector growth. If both oversight and regulations are considered properly will ensure every involved stakeholder meets his responsibilities accordingly.

3) Budgetary allocation – respective governments are urged to increase budgetary allocation to the sector to at least one – tenth of the total government expenditure annually which is internationally recommended.

4) Disbursement of budgeted and approved funds – respective governments are urged to ensure time disbursement of all budgeted and approved funds accordingly. This will help to implement all approved sector activities as planned.

5) Proper management of funds allocated to the sector – the current situation indicates that the sector has been used as seepage for extracting public resources for extravagant expenditures. Respective governments are advised to exert proper management of public funds for effective growth of the sector. The researcher suggests deduction of recurrent expenses to at most 40 percent of the total funds allocated to the sector while increasing capital expenses to at least 60 percent.

6) Public investment to the sector should be in line with its contribution to the national GDP of the respective government – the current situation indicates that despite its significant contribution between 18 and 32 percent to the national GDP, it has been receiving an allocation of less than 10 percent.

7) Special agricultural banking and credits – the Indian government is advised to extend the service to rural areas, ensure all prospective beneficiaries especially small scale rural farmers are reached to reflect their current nominal data; for Tanzania, the newly

established agricultural bank should be sponsored and expanded to all regions to ensure services at lower levels.

8) Fertilizer consumption – Indian government should consider to increase per ha consumption of fertilizers to the recommended international standards rates; Tanzania should consider to investing into fertilizer manufacturing industries for reducing the current importation costs and duties that have made it a price taker.

9) Agriculture mechanization – let the government especially of Tanzania consider increasing the tractor density per 1,000 ha to the recommended world standard. This can be achieved by subsidizing all mechanized equipment and/or providing loans to farmers for acquiring the same; the already acquired equipment should be complemented with other facilities like irrigation facilities to farmers for enabling them operate throughout the year rather than leaving them idle as it is currently due to dependence on rainy fed farming; Tanzania should consider investing into self manufacturing industries of mechanical equipment to cut off the current importation costs and duties.

10) Irrigation farming promotion – to ensure year round production, respective governments are advised to invest into irrigation farming. Currently there exist a wide gap between that irrigation potential and the actual irrigation statuses. This should be roofed. Let at least 50 percent of the irrigable land be utilized within each country respectively.

11) Institutional control to all agricultural service providing organizations (banks and insurance companies) – especially private firms are profit oriented, when not controlled and regulated, will always set interests and premiums in favor of themselves rather than serving farmers.

12) Sector reform – some of individual subsectors and/or departments of the sector (irrigation, horticulture, marketing, R&D) have been dormant. Respective

governments should undergo restructuring to ensure all necessary departments are functioning properly.

13) Post harvest losses management and value chain management – due to dependence on rainy farming, most of the crops farmed are seasonal the situation that makes many crops to get ripen on the same time and many of them just perish due to lack of cold storage and preprocessing facilities and/or distribution channels to market. Both governments are argued to establish adequate scientific storages facilities with adequate capacity in rural areas to persuade the farmers' demands for storage, cooling and processing their produce. Availability of storage facilities especially warehousing receipts is termed as the insurer of smallholder farmers this should be emphasized by governments of both countries. Both scientific storage and warehousing receipt system should be complemented with appropriate storage and preprocessing skills to the stakeholders.

14) Agriculture insurance - the Indian government is advised to extend the service to rural areas, ensure all prospective beneficiaries especially small scale rural farmers are reached to reflect their current nominal data; for Tanzania it is high time for establishment of special agricultural insurance schemes and extend them to the rural areas to insure all agricultural stakeholders.

15) Agricultural marketing - both governments are argued to strongly invest on this important aspect by considering the following features:
    a. Provision of relevant and adequate agricultural marketing information on time
    b. Imparting relevant skills to respective stakeholders, this will help them to …
    c. Avoiding unnecessary barns to farmers from selling and/or exporting their farm produce, instead they should facilitate their farming to ensure year round production
    d. Provision of pre-cooling and preprocessing facilities for value addition to their produce before they sell them

e. Food security – based on the findings, despite their good scores in the global hunger index the number of unnourished people is very high with both countries, and the domestic food price volatility and food import rate for Tanzania are very high. Respective governments are advised to increase food production to persuaded their population demand

16) Land survey, acquisition and management - Respective government should consider facilitating their farmers by giving them enough but surveyed land with all relevant documents which can be used as collaterals to secure loans from financial for enabling them to transform from subsistence farming to commercial or agribusiness to improve their individual economy and the countries as well. This was insisted by Charles (2010) that land ownership issues need to be clarified before farmers are truly empowered to run sustainable businesses.

17) Investment into research and development – this is only reliable instrument that will help any entity to analytically plan and decide how scarce resources should be allocated across different sectors of the economy or within a sector how should resources be distributed by priorities. Unfortunately, it has been receiving low consideration within both countries with an average of less than one percent of the total funds allocated to the sector.

18) Increasing the number of FTE agricultural experts - Governments need to facilitate this aspect by increasing the number of both agricultural researchers and extension officers together with increased agriculture research centers/institutions. More agricultural experts should be trained, distributed and retained within their respective rural areas; those few available should be equipped with appropriate working tools especial transport facilities. This should be to enable extension officers for an easier and wide reach to farmers.

19) Timely supply of agricultural inputs (seeds and agrochemicals) – Farming in most of the areas within both countries is a timed and seasonal activity as they depend on

uncertain rainfalls. This necessitates timely supply of respective inputs; otherwise an act of delay may result into becoming useless unless they are kept for the subsequent seasons.

20) Transport facilities – governments are advised to construct rural roads especially feeder/farm roads (known as pucca in India) and sustain routine maintenance to ensure passage throughout a year. This will facilitate easily ferrying of both farm inputs to the farm yard and farm produce from the farm yard to nearby markets.

21) Encourage involvement of private into agriculture promotion - A support on the participation of the private sector to promote the sector is important. This can be achieved when governments enact policies and laws that attract private investors to supply agricultural related equipments at subsidized costs.

22) First call centers - these are schemes full financed by governments in most countries to where farmers do dial the toll-free numbers and get their queries answered by the respective expertise. This means farmer's queries (except those complex one that need physical appearance of an expert) are solved while he is at his farm yard proceeding with production activities and the expert in his office serving many others. Indian government is advised to extend the service to all rural areas and ensure all prospective beneficiaries are covered. For Tanzania government they should consider to establish the same.

23) From politics to realistic – recognizing the importance of the sector to the country members' population on the political platforms is no longer a deal; there should be a rational reflection of such recognition to the sector through allocation of resources and management of such resources for the effective growth of the sector rather than using it as a seepage of public resources for personal gains.

All the above suggestions can be summarized in the words of GOI (2014): that improved performance at farm level results into improved food security and improved farm

livelihoods. But this can happen only if other components in the value-chain (infrastructure supporting agricultural upstream and downstream activities - transport, storage, processing and marketing) facilities for agricultural products are also developed simultaneously. This means governments should set enabling policies and institutions in a variety of domains – from R&D to trade and markets, natural resource governance to collective action by agricultural producers, agricultural extension and rural advisory services to bring knowledge, technologies, and services to farmers and entrepreneurs without forgetting investment in relevant public goods which work both as a catalyst of, and complements to, private investment in agriculture.

6.3 Conclusion

Based on the findings from both primary data and secondary data sources the researcher has set the following conclusion of the study

There are strong evidences that there is a positive correlation between public investment and agricultural growth, rural development and poverty reduction. Thus an act by the government to stimulate agriculture at a scale induces the sector growth by increasing food production and rural incomes hence poverty reduction. It has been proved by research that investment in agriculture is 2.5 to 3 times more effective in increasing the income of the poor than in non-agricultural investment but a one percent change in agricultural expenditure as a share of GDP turns out with a 0.43 percent reduction in poverty. Unfortunately, such impacts are rarely observed in the majority of the developing countries not only due to lack of both commitment and consistency in funding the sector but also a pile of erroneous in management of the funds allocated to the sector. Agriculture sector is the major factor for sustainable development particularly in most of

the developing countries. It is among the largest and most important sectors for economic growth and poverty reduction with high economic pay-off in terms of shares of GDP, capital formation, employment creation, and food and nutritional security. It has been concluded by the WB that the GDP growth originating from agriculture is about four times more effective in reducing poverty than GDP growth of other sectors and it can help reduce poverty for more than one-third of the world's poor, who live in rural areas and work mainly in farming. Therefore an act to investment to agriculture benefits not only the sector but also have both direct and indirect benefits to almost all other nonagricultural sectors especially manufacturing industry by ensuring food and nutrition security to their employees and assurance of raw materials and a reliable market of their products- agrochemicals, modern farming instruments, harvesting and packaging and distribution equipment.

The primary role and responsibility to ensure general economic stability and individual sector growth through full employment of resources for poverty reduction rests to the respective government. However, agriculture has historically remained a low considered sector in most of developing regions and received low investment compared to its vital contributions to the national GDP of the respective government including the case study countries. There lacks both deliberate plans and enabling policies to promote the sector and proper management of resources allocated to the sector for its effective growth. The budgetary allocation trends to the sector as a proportion of total government expenditure has remained as low as 7 percent for more than ten years. Budgeted and approved funds to the sector could be partially disbursed from central governments respectively. The sector has been used as seepage where huge amounts of meager resources allocated to it were used by a few in offices for non development activities. There still exists a wide gap between the nominal information provided by the governments about resources injected to the sector, availability and/or provision of necessary support of essential requirements to stakeholders for sector growth and the real situations at the respective fields together with farmers' outcry. Almost all kinds of investments that work to enhance agricultural growth have not been considered in most of the fields. A few services provided to stake holders do not satisfy majority of the individual prospective beneficiaries. Unless the

respective governments pay attentive consideration to the sector starting from funding to proper management of such funds and/or other resources allocated to the sector, it may take some decades more for the sector stakeholders to realize the socio economic benefits resulting from public investment to the agriculture sector.

However, the agriculture sector development cannot be brought or fulfilled by the public sector alone. There should be a fine bond between the public and private sectors. This can be achieved through clear policies encouraging private stakeholders to invest into the sector with minimum restrictions, taxes and rules. Let the existing policies be reformed in line with the current situation and demand for the sake of agriculture sector growth.

6.4 Major Contribution

This research was conducted as a comparative case study of the governments of the two countries of India and Tanzania aiming to gauge the economic relationship between public investment and the agriculture sector. The following is a summary of the original contribution of the thesis:

i) The linkage between public investment and agriculture sector together with the role and responsibilities of the respective governments for the sector growth has been ascertained clearly within this thesis with clear contribution of the agriculture sector to the national GDP within the respective case study countries. This will help respective governments and other respective regions country members to meet their responsibilities by allocating public resources to various sectors based on their contributions to the national GDP respectively.

ii) Previous trends of budgetary allocation and management of public resources allocated to the sector have been ascertained in this thesis. It will help the respective governments to allocate such meager resources disbursed to the sector for important activities or aspects which have direct impacts to both individual stakeholders and the government as a whole by exerting proper discipline on management of public resources allocated to the sector for effective growth outcomes.

iii) The thesis has ascertained a great gap between the nominal information about different aspects relevant to the sector growth from the respective governments and/or institutions and the actual situations at the field levels this attracts attention of a committed government to assess the causes of such difference and address them accordingly. It will help the respective governments to get rid of desk work and go to the field for ascertaining actual situations of stake holders of the sector.

iv) Farmers' outcries on the missing basic services that are deemed to be the primary responsibilities of respective governments pertaining to the sector growth together with causes of success and/or failure of either of the case study countries in some aspects relevant to the sector development have been identified within this thesis. If observed attentively will help the respective case study countries to promote growth of individual stakeholders and the whole sector in a prosperity way.

v) Problems faced by stakeholders in agricultural public spending from an individual stakeholder to the institutional level were clearly identified within the case study areas. When considered properly will help the respective governments to spend public resources in a cost effective way.

Generally, results of this thesis are useful to case study countries and their respective regions country members by assessing themselves about their performances compared to both the world and their regional standards, hence addressing all identified anomalies for effective growth of their individual stakeholders and the sector as a whole.

6.5 Scope for Future Research

The future research can be done on same way of comparison of individual local government authorities (LGA) in selected regions or states to identify and analyze the trends agriculture sector contribution to their own source revenue and of portion such revenue that have been re-invested into the agriculture sector for its growth. Research indicates that the sector has been one among their major sources of their own source

revenue contributing on average between 4 and 90 percent. However, it is not clearly known how much of such revenue have been re-invested into the sector.

Other areas may be conducted on:

i) Assessment of export earnings from major economic activities of the economy (agriculture, industry and construction and services) in a particular country.
ii) The position of a woman on access landholdings for agriculture activities, on individual countries or as a comparative study
iii) Initiatives of government to attract and lobby more youth to engage themselves into the sector and retain them at their local dwelling places in order to reduce the rates of village/rural – to urban fleeing of youth.

6.6 Limitations of the study

The study was not as smooth to allow everything to be done as planned. The following are the significant constraints that were encountered during the study:

i. Delayed permissions for entrance and data gathering from some of the targeted respondents especially government institutions. This could cost about eight to ten weeks from the date of submission of introduction letters and other relevant documents.
ii. Poor co-operation from some respondents approached within the study countries. This also was experienced from some of government officials within both of the case study countries as they were not ready to use their time.
iii. Limited access to secondary data sources especially from the Tanzania side; some of the responsible officials were not willingly what was being requested from their offices, this could cost much time and energy of the researcher for getting required information from a single department of the entity.
iv. Geographical location of some targeted respondents – because of the nature of our targeted respondents most of them live in rural areas and some among them were located in marginal areas where we were forced to hire private transport within those areas and sometimes walk on foot.
v. Communication barriers, most of the targeted respondents could not communicate in English the situation that forced the researcher to hire translators for translating the

questionnaires into respective local languages and to move with them during personal interviews for translations respectively.

vi. Biasness possibility in the primary data responses – there is no clear means to be certain with respondents' answers

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Appendices

Appendix A:

List of Published Papers

S	Title of the paper	Book/ Journal	Affiliated Institute	Year, Volume
Papers Published in International Referred Journals				
1.	Agricultural Marketing; Are governments Truly Committed to promote Small-Scale Famers? A case study of Gujarat State – India and Morogoro Region in Tanzania	IJRESS	Euro Asia – Research and Development Institute, ISSN: 2249-7382	Nov; 2017 Vol.7, No. 11, (pp. 376 – 397)
2.	A study on Women Access to Landholdings for Agriculture Activities; The case study of Gujarat State in India and Mbeya Region in Tanzania	Asian Agri-History Foundation Journal	Asian Agri-History Foundation, ISSN: 09717730	June 2017, Vol. 21 (3) (pp163 – 180
Papers Published in International Conference Proceedings				
3.	Post harvest losses; A Major Obstruction to Agribusiness for Small Holders of Agriculture Sector in Developing Countries; The case study of Gujarat State in India and Tanga Region in Tanzania	Twelfth biennial conference on entrepreneurship	Entrepreneurship Development Institute of India EDII, Ahmedabad Gujarat and Bookwell Dheli, ISBN: 978-93-80574-93-6	Feb; 2017
4.	Are the Constitutional Provisions of the Supreme Audit Institutions Independence Shielded? An analysis of the India and Tanzania	2nd International Conference on Corporative Governance: Contemporary Issues &	Gujarat Technological University, ISBN 978-93-5122-000-8	March, 2014 (pp156-166)

S	**Title of the paper**	**Book/ Journal**	**Affiliated Institute**	**Year, Volume**
	National Audit Offices	Challenges in Indian Economic Environment		
5.	The Role and Challenges of SAIs on Public Financial Management and Good Governance: An Analysis of Tanzania and India National Audit Offices	International Conference on "Management of Globalized Business; Emerging perspective"	Marwadi Education Foundation's Group of Institutions, Rajkot ISBN: 978-1-63266-982-7	Feb; 2014

Appendix B

Questionnaires in English Language

Questionnaire

I, David S. Lwechungura, a research scholar of Gujarat Technological University (GTU), Chandkheda Campus, Ahmedabad – India, am collecting information as a part of the requirements to fulfil my PhD program – **A study on Socio Economic Effect of Public Spending on Agriculture Sector in Tanzania and India.** I therefore hereby request your cooperation by providing relevant information by filling in this questionnaire to serve as data collection instrument that will help me to develop a sound report. I do appreciate your support and encouragement provided through this information and assures you that the information provided will be used for academic matters only. Thank you.

1. Name:
2. Gender: Male ____ Female_____
3. Age:_____ (in Years)
4. Your Occupation: Farming_____ Cattle Rearing_____ Job_____ Business_____
5. Village:_____
6. District:_____
7. Taluka/Ward:_____
8. State:_____
9. (a) Land Size: ***(Tick only one)***

Marginal (less than 1 ha)	Small (1 to 2 ha)	Medium (More than 2 ha)

(b) Nature of Land Owned for Farming: ***(Tick only one)***

Fully owned	Fully owned + other leased	Leased only

10. During the sowing season where do you get seeds for your farming? ***(Tick as applicable)***

Own locally reserved	From approved farm implements distributors	From fellow colleagues/ farmers	Others (Specify)

11. Which of the farm instruments do you use for farming? ***(Tick as applicable)***

Hand Hoe	Plough	Power Tiller	Tractor

12. How do you meet the farming cost? ***(Put √ accordingly)***

By Own Funds	
Money Lenders	
Loans from Banks/Financial Institutions	
Credits from traders	
Others (Specify)	

13. How many times in a year do you use the storage facility, which is available in the local area?_____ (Times)

14. On an average what percentage of losses do you experience post harvest (after harvest)? ***(Tick only one)***

None	1-5%	6-10%	Above 10%

15. How much percentage of your produce do you sell locally or export? ***(Tick only one)***

None	Less than 5%	5 to 10%	11 to 49%	50% and Above

16. What is the average of your per hectare consumption of fertilizer during last three years Kg/ha? ***(Tick only one)***

Less than 10	10 to 50	51 to 100	101 to 500	5001 to 1,000	Above 1,000

17. Have you ever attended any training, seminar or workshop on modern faming within the last two years? Yes _____ No_____

18. From Q18 above, if YES, How did you meet the participation cost? ***(Tick as applicable)***

Self Sponsored	Government	Development Partners

19. Have you ever receive any crop loans or government subventions related to agriculture? Yes_____ No_____

20. Have you ever experienced any crop loss in past 3 years? Yes_____ No_____

21. Give the amount of loss incurred in last three years:

Types of crops involved	Loss (in Rs.)
Total	

22. What was the major reason of crop failure? ***(Tick as applicable)***

Climatic condition	Economic reasons	Poor quality of raw material	Others (Specify)

23. How did you recover the loss and revert to your normal economical status? ***(Tick as applicable)***

Alternatives	***Put √***
Crop Insurance	
Government grant	
Loan from Banks	
Loans from relatives	
Sale of properties	
Sale of livestock	
Borrow from moneylender	
Never recovered	

24. Does the government provide the following services to support agriculture development within your area? Put √ **or X** towards provision of support. Also put appropriate √ to indicate your rate of satisfaction. (5: Extremely Satisfied, 4= Satisfied, 3= Neutral, 2 = Dissatisfied, 1= Extremely Dissatisfied)

	Particulars	**Provided**		**Satisfaction level**				
		Yes	**No**	**5**	**4**	**3**	**2**	**1**
1.	Land survey, acquisition, ownership & development							
2.	Agriculture input supply:							
	Seeds							
	Agrochemicals (fertilizers and pesticides)							
3.	Subsidies on Agriculture input supply							
4.	Electricity supply							
5.	Farm Mechanization (agricultural tools)							
6.	Irrigation facilities							
7.	Crop loan facilities							
8.	Crop insurance							
9.	Horticulture promotion							
10.	Animal husbandry and veterinary services							
11.	Diary faming support							
12.	Warehousing (Storage facilities)							
13.	Postharvest management							
14.	Farm produce Processing facilities							
15.	Transportation infrastructure (Farm roads)							
16.	Marketing infrastructure and support							
17.	Agricultural value addition							
18.	Agricultural banking and financial facilities							
19.	Agriculture insurance							
20.	Training and awareness							
21.	Export support							
22.	Agriculture technology							
23.	Timely delivery of inputs							
24.	Farmers' First Call Centers							

Appendix C:

Questionnaires in Local Language (Gujarat)

પ્રશ્નાવલી

1. નામ : .....
2. જાતિ : પુરૂષ ..... મહીલા .....
3. ઉંમર :..... (વર્ષમાં)
4. તમારો વ્યવસાય :
   ખેતી ..... પશુપાલન ..... નોકરી ..... ધંધો .....
5. ગામ : .....
6. જિલ્લો : .....
7. તાલુકો:.....
8. રાજ્ય:.....
9. જમીનની વિગત (√ નિશાની કોઇપણ એક ઉપર કરવી)
   સિમાંત ખેડુત (1 હેક્ટરથી ઓછી) .....
   નાના ખેડુત (1 થી 2 હેક્ટર) .....
   મોટા ખેડુત (2 હેક્ટરથી વધુ) .....
10. વાવણીના સમયે તમને ખેતી માટે બીજ ક્યાંથી ઉપલબ્ધ છે. (લાગુ પડે ત્યાં √ ચિન્હ કરો.)
    પોતાની પાસે સંગ્રહેલા જથ્થામાંથી .....
    માન્ય વિકેતા પાસેથી .....
    અન્ય ખેડુત મિત્રો પાસેથી .....
    અન્ય (જણાવો) .....
11. તમે કયા ખેત ઓજારો ખેતી માટે વાપરો છો? (લાગુ પડે ત્યાં √ ચિન્હ કરો.)
    હાથ ખેડવાનો ખરપિયો .....હળ .....પાવર ટ્રેલર .....ટ્રેક્ટર .....
12. તમે ખેતીના ખર્ચા માટે ક્યાંથી પૈસાની વ્યવસ્થા કરો છો?
    પોતાના પૈસા.....
    શાહુકાર પાસેથી .....
    બેન્ક/નાણાં સંસ્થામાંથી લોન .....
    વ્યાપારી પાસેથી ઉધાર મેળવીને .....
    અન્ય (જણાવો) .....
13. તમારા મંતવ્ય જણાવો:

વિગત	ચિન્હ √અથવા x મુકો
સમય પર ખેતીને લગતા બીજ અને ખાતર મળી રહે છે	
બીજ અને ખાતર પોસાય એવા ભાવ પર મળી રહે છે.	
સંગ્રહની સવલત સરળતાથી નજીકના વિસ્તારમાં મળી રહે છે.	
ખેત પિદાશોને મુલ્યવર્ધક બનાવવા માટે માળખાકીય સવલતો નજીકના	

વિસ્તારમાં મળી રહે છે.	
ખેડૂતો માટેના પ્રથમ કોલ સેન્ટર સેવા ઉપલબ્ધ છે.	
ખેતી માટેની ઇન્શ્યોરન્સ (વિમા) સ્કિમ ઉપલબ્ધ છે.	
ખેતી માટે સબસીડી ઉપલબ્ધ છે.	

14. તમે વર્ષમાં નજીકના વિસ્તારમાં મળતી સંગ્રહ કરવાની સવલતોનો કેટલીવાર ઉપયોગ કરો છો?

..... (વાર)

15. અંદાજીત કાપણી પછી સરેરાશ કેટલા ટકા નુકાશની ભોગવો છો? (√ ચિન્હ એક ઉપર જ કરવું)

કોઇ જ નહિ	1-5 ટકા	6-10 ટકા	10 ટકાથી વધુ

16. ખેત પેદાશોની કેટલી ટકાવારીની નિકાસ (એક્ષપોર્ટ) કરો છો?

17. છેલ્લી ખેતીની સિઝનમાં તમે હેક્ટરદીઠ કેટલા કિલોગ્રામ રસાયણનો ઉપયોગ કર્યો હતો? .....

(KG/HA)

18. શું તમે ક્યારેય છેલ્લા બે વર્ષ દરમિયાન ખેતીને લગતી કોઇ તાલીમ, સેમિનાર અથવા વર્કશોપમાં ભાગ લીધો છે?

હા ..... ના .....

19. તમે તાલીમનો ખર્ચ કેવી રીતે પહોંચી શક્યા?

જાતે પોતાના પૈસાથી	સરકાર તરફથી	વિકાસ સાથીદાર પાસેથી	લાગુ પડતુ નથી

20. શું તમે ક્યારેય કોઇ પાક માટે કે અન્ય ખેતી માટે કોઇ લોન મેળવી છે?

હા ..... ના .....

21. શું તમને છેલ્લા 3 વર્ષ દરમિયાન પાકની નુકશાની થઇ છે? હા ..... ના .....

22. છેલ્લા 3 વર્ષમાં નુકશાનીની રકમની વિગત આપશો

વર્ષ	ઋતુ	પાકનું નામ	કુલ નુકશાન (રૂ.માં)
2014-15			
2013-14			
2012-13			

23. પાકને નુકશાની કયા કારણોસર પહોંચી હતી? (લાગુ પડે ત્યાં √ ચિન્હ કરો.)

હવામાનની પરિસ્થિતિ .....

આર્થિક કારણોસર .....

કાચામાલની ખરાબ ગુણવત્તા .....

અન્ય (જણાવો) .....

24. તમે આર્થિક નુકશાનમાંથી કેવી રીતે બહાર આવી ને સામાન્ય સ્થિતિમાં આવ્યા? (લાગુ પડે ત્યાં √ ચિન્હ કરો.)

વિકલ્પો	ચિન્હ √ અથવા X મુકો
પાકનો વિમો	
ગર્વમેન્ટની ગ્રાન્ટ (સહાય)	

બેન્ક પાસેખી લોન	
સગાવાલા પાસેથી લોન	
પોતાની મિલકત વેચીને	
પશુઓ વેચીને	
સાહુકાર પાસેથી ઉધાર લઇને	
ક્યારેય નુકશાની ભરપાઇ થઇ નથી	

25. નીચે દર્શાવેલ મળતી વસ્તુ મુજબ તમારો અભિપ્રાય એક માર્જીનલ અને નાના ખેડુત તરીકે આપો.

વાક્ય	અત્યંત ઉપોયગી	ઉપયોગી	તટસ્થ	બિનઉપયોગી	અત્યંત બિનઉપયોગી
	5	4	3	2	1
ખેતી માટેની સબસીડી					
ખેતી વિમા યોજના					

26. શું સરકાર તમારા વિસ્તારમાં ખેતીને આગળ વધારવા અને મદદ કરવા સેવાઓ પૂરી પાડે છે? √ અથવા X મુકી જવાબ આપો. સાથે તે સેવાઓ કેવી છે તેનો અભિપ્રાય પણ √ ચિન્હ મુકીને આપો (5=સંપૂર્ણ સંતુષ્ટ, 4=સંતુષ્ટ, 3=તટસ્થ, 2=અસંતુષ્ટ, 1=સંપૂર્ણ અસંતુષ્ટ)

સેવાઓ	મળવાપાત્ર		સંતુષ્ટતાનું માપદંડ				
	હા	ના	5	4	3	2	1
1) જમીનની આકાંણની ખરીદી,માલિકી અને વિકાસ							
2) ખેતીમાં વપરાતી વસ્તુઓનો પૂરવઠો : બીજ, ખેતીને લગતા રસાયણ (ખાતર તથા જંતુનાશક)							
3) ખેતરમાં વપરાતી ચિજો ઉપર સબસીડી							
4) વિજ પુરવઠો							
5) ખેતરમાં વપરાતા ઓજારોનું આધુનિકકરણ							
6) સિંચાઇ સેવાઓ							
7) પાક માટે લોનની વ્યવસ્થા							
8) પાક વિમો							
9) હોર્ટીકલચરનો ફેલાવો							
10) રેશમ ઉત્પાદન/કુલ ઉછેર /જળચર ઉછેર ને ટેકો							
11) પશુપાલન અને પશુ ચિકિત્સા સેવાઓ							
12) દૂધ મંડળીને ટેકો							
13) સંગ્રહ મટેની સવલતો							
14) પાક કાપણી પછી જાળવણીની વ્યવસ્થા							
15) ખેત પેદાશોમાં મુલ્યવર્ધકની સેવાઓ							

16) વાહન વ્યવહારની સવલતો (ખેતરનો રસ્તો)							
17) વેચાણ માટેની માળખાકિય સવલતો અને ટેકો							
18) ખેત પેદાશમાં મુલ્યવર્ધક પગલા							
19) ખેતીને લગતી બેન્કિગ સેવાઓ અને નાણાંની સગવડ							
20) પાક વિમો							
21) તાલીમ અને જાણકારી							
22) નિકાસ માટે પ્રોત્સાહન							
23) અન્ય (Intelligence) સેવાઓ							
24) ખેતીને લગતી ટેકનોલોજી							
25) મરધા ઉછેર							
26) મત્સ્ય ઉછેર							
27) અન્ય (જણાવો)							

27. તમે ખેતીને લગતા રોજીંદા કયા પ્રશ્નનો તમે સામનો કરો છો, તે જણાવો?

.....

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.....

.....

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28. તમારા મંતવ્ય અનુસાર ખેતી ક્ષેત્રને કેવી રીતે સુધારી શકાય તેના સુચનો આપો?

.....

.....

.....

.....

.....

29. સરેરાશ તમે દરેક પાક ઉપર કેટલો ખર્ચ કરો છો (ખેતરની પૂર્વ તૈયારીથી વેચાણ સુધી)

વિગત	કપાસ	મકાઇ/ બાજરો	ઘઉ/ ચોખા	કેળા	શેરડી	મગફળી	એરંડા/ તેલીબીયા	કાસવા	ટામેટા	અન્ય (જણાવો
બીજ	1430									
ખાતર	715									
સિંચાઇ	2000									
જંતુનાશક	1290									
મજૂર ખર્ચ	4280									

Appendix D

Questionnaires in Local Language (Kiswahili)

DODOSO

1. Jina:
2. Jinsia: Mme ____ Mke_____
3. Umri:_____ (Miaka)
4. Kazi yako: Mkilima_____ Mfugaji_____ Mwajiriwa_____ Biashara_____
5. Kijiji Chako:_____
6. Kata:_____
7. Wilaya:_____
8. Mkoa:_____
9. (a) Ukubwa wa ardhi unayomiliki kwa ajili ya kilimo: ***(Weka (✓) sehemu moja)***

Chini ya hekta1	hekta1 mpaka 2	Zaidi ya hekta 2

(b) Aina ya umiliki wa hiyo ardhi: ***(Weka (✓) sehemu moja)***

Yangu mwenyewe	Yangu mwenyewe na ya kukodi	Nimekodi tu

10. Wakati wa msimu wa kupanda unapata wapi mbegu kwa ajili ya kilimo chako? ***(Weka (✓) sehemu husika)***

Nilizohifadhi mwenyewe	kutoka kwa wakulima wenzengu	kwa wasambazaji wa pemejeo waliothibitishwa	Njia nyinginezo (elezea)

Ikiwa nyinginezo, tafadhali elezea

_____

11. Kati ya nyenzo zifuatazo ipi unatumia kwa ajili ya kilimo? ***(Weka (✓) sehemu husika)***

Jembe la mkono	La kukokotwa na wanyama	Trekta la mkono	Trekta kubwa

12. Ni kwa jinsi gani huwa unazimudu gharama za kilimo? ***(Weka (✓) sehemu husika)***

Kwa vyanzo vyangu mwenyewe	
Kwa Mikopo kutoka Benki / Taasisi za Fedha	
Matajiri Wakopeshaji Fedha	
Njia nyinginezo	

13. Ni mara ngapi kwa mwaka unatumia ghara ya kuhifadhi mazao lililopo karibu na eneo lako? _____ (idadi)
14. Kwa wastani, ni asilimia ngapi ya mavuno ya mazao yako huharibika kabla ya kuuzwa au kuliwa? ***(Weka (✓) sehemu moja)***

Hakuna	1-5%	6-10%	Zaidi ya 10%

15. Kwa wastani, ni asilimia ngapi ya mazao yako ya kilimo kila mwaka unauza au kusafirisha nje ya nchi/ (Export)? ***(Weka (✓) sehemu moja)***

Hakuna	Chini ya 5%	5 mpaka 10%	11 mpaka 49%	50% na zaidi

16. Kwa wastani, ni kiasi gani cha mbolea kwa hekta (Kg /ha) ulitumia katika msimu miaka mitatu iliyopita? ***(Weka (✓) sehemu moja)***

Chin ya10	10 - 50	51 - 100	101 to 500	5001 - 1,000	Zaidi ya 1,000

17. Je, umewahi kuhudhuria mafunzo yoyote, semina au warsha juu kilimo cha kisasa kwa kipindi cha miaka miwili iliyopita? Ndiyo _____ Hapana_____

18. Kutoka Na. 17; Kama NDIYO Nani alikuwa mdhamini wa mafunzo hayo kwa ajili yako? ***(Weka (✓) sehemu husika)***

Binafsi	Serikali	Wadau wa Maendeleo

19. Je, umewahi kupata mkopo wowote wa mazao au ruzuku toka serikalini kuhusiana na kilimo? Ndiyo _____ Hapana_____ ***(Weka (✓) sehemu husika)***

20. Je, umewahi kupata hasara yoyote ya mazao katika kipindi cha miaka 3 iliyopita? Ndiyo _____ Hapana_____ ***(Weka (✓) sehemu moja tu)***

21. Kutoka Na. 20, Kama ndiyo, tafadhali kiasi cha hasara uliyopata:

Aina ya mazao	**Kiasi (shs)**
Jumla	

22. Ni nini ilikuwa Sababu au chanzo cha hasara uliyopata? ***(Weka (✓) sehemu moja tu)***

Hali ya hewa	Sababu za kiuchumi	Ubora wa pembejeo	Nyinginezo

23. Uliwezaje kurejea katika hali yako ya kawaida baada ya hasara? ***(Weka (✓) sehemu husika)***

Alternatives	**Use ✓**

Bima ya mazao	
Ruzuku toka serikalini	
Mkopo toka benki	
Mkopo toka kwa ndugu	
Kuuza sehemu ya mali	
Kuuza mifugo	
Mkopo toka wakopeshaji	
Sikuwahi kurejea hali yangu ya awali	

24. Serikali hutoa huduma zifuatazo ili kusaidia kukua kwa sekita ya kilimo katika eneo lako? Weka alama ya ✓ au **X** kukubali au kukataa. Pia weka alama ✓ panapohusika kuonyesha kiwango cha kuridhika na huduma husika. (5: Naridhika sana, 4= Naridhika, 3= Sina jibu, 2 = Siridhiki, 1= Siridhiki kabisa)

	Particulars	**Provided**		**Satisfaction level**				
		Yes	**No**	**5**	**4**	**3**	**2**	**1**
1.	Upimaji, ununuzi na umiliki wa aridhi							
2.	Usambazaji wa pembejeo za kilimo:							
	Mbegu							
	Kemikali za kilimo (mbolea na dawa)							
3.	Ruzuku kwa pembejeo Kilimo							
4.	Usambazaji wa umeme vijijini/mashambani							
5.	Zana za kilimo (mashine)							
6.	Vifaa vya umwagiliaji							
7.	Mkopo wa mazao							
8.	Bima ya mazao/kilimo							
9.	Ukuzaji wa kilimo cha mboga mboga na matunda							
10.	Huduma za mifugo							
11.	Uzalishaji maziwa							
12.	Huduma ya kuhifadhi mazao							
13.	Udhibit wa upotevu wa mavuno							
14.	Huduma ya kuchakata mazao							
15.	Miundombinu ya barabara							
16.	Miundombinu ya masoko							
17.	Kuongeza thamani							
18.	Benki ya kilimo							
19.	Bima ya kilimo							
20.	Kujenga uwezo							
21.	Kuuza mazao nje ya nchi							
22.	Teknolojia ya kilimo bora							
23.	Usambazaji wa pembejeo kwa wakati							
24.	Vituo vya huduma kwa wakulima							

Appendix E

Introduction Letter for Data Collection (in India)

Shri Jairambhai Patel Institute of Business Management & Computer Applications (SJPI)
(National Institute of Co-operative Management Group of Institutions)

Post Graduate Centers of Gujarat Technological University-MBA & MCA
Approved by All India Council for Technical Education, MHRD, New Delhi

Dr. S.O.Junare
Director-Technical Campus

Date :

Ref:Ph.D./David/Request_2015

Date: 16-02-2015

TO WHOM SO IT MAY CONCERN

This is to certify that Mr. David Stephen Lwechungura, is a Ph.D. Scholar, from Tanzania and he is pursuing his full time Doctoral degree (Ph.D.) in Management at this Research Center approved by the Gujarat Technological University. It may be noted that, Mr. David Stephen is a Government Employee in Tanzania and presently holding a position as an Auditor, in Revenue Authority, Government of Tanzania. Mr. David Stephen is pursuing his doctoral research, leading to Ph.D. degree on the Scholarships sponsored by the ICCR, Government of India.

Mr. David Stephen is pursuing his doctoral research at on the topic titled, "A Study on Socio-Economic Impact on Public Spending in Agriculture Sector: A comparative study of India and Tanzania". For his research he has selected three states from India, namely Gujarat, Madhya Pradesh, Rajasthan as a sample from India and he will make comparative analysis of public spending in agriculture sector by these states Vis-à-vis Tanzania.

As a part of his research he is required to visit various government offices like Department of Agriculture, Department / Directorate of Fisheries, Department of Horticulture, Department of Cooperation, Department of Finance, Department of Economics and Statistics and other government departments from Gujarat, Madhya Pradesh, Rajasthan states. He is also required to meet farmers from these states to measure the impact of public funding by government on their social and economic conditions of public in general and farmers in particular.

I as a Ph.D. Supervisor /Guide of Mr. David Stephen, request to all the concern officers to provide the authentic data/information to him for his doctoral research. I assure you that, the data provided by you will be used by him for academic/research purpose only.

Looking for your favorable support and cooperation for the cause of cooperation.

Thanking You,

Yours Trully,

SJPI NICM G'Nagar PG Centre of GTU Ahmedabad

Dr S O Junare
Director, SJPI-NICM Gandhinagar and
Dean, Faculty of Management, Gujarat Technological University

Nr. Infocity, Indroda Circle, Gandhinagar - 382 007, Gujarat.

Appendix F

Introduction Letter for Data Collection (in Tanzania)

THE UNITED REPUBLIC OF TANZANIA

NATIONAL AUDIT OFFICE

Office of the Controller and Auditor General, Samora Avenue, P.O. Box 9080, DAR ES SALAAM.
Telegram: "Ukaguzi", Telephone: 255(022)2115157/8, Fax: 255(022)2117527, E-mail: ocag@nao.go.tz, Website: www.nao.go.tz

22/04/2015

Permanent Secretary,
Ministry of Agriculture, Food and Cooperatives
P.O. Box 9192,
Dar es Salaam

INTRODUCTION OF MR. DAVID STEPHEN LWECHUNGURA - AUDITOR

This is to certify that Mr. David Stephen Lwechungura is an employee of the National Audit Office of Tanzania (NAOT) in the position of Auditor I.
Currently Mr. David id is pursuing his Doctoral degree (PhD in Management - Finance) at Gujarat Technological University (GTU) in India.
His research topic is titled: **"A Study on Socio Economic Impacts of Public Spending on Agriculture Sector: A Comparative Study of India and Tanzania".**

As a part of his research he is supposed to visit various government institutions, ministries and departments within the study countries respectively to collect data that will help him to develop a sound report. He has selected a sample of three states in India **(Gujarat, Maharashtra and Rajasthan)** and eight regions from Tanzania **(Dodoma, Kageara, Morogoro, Mbeya, Mwanza, Rukwa, Shiyanga and Tanga)** and all of their respective districts. He is also required to meet sampled farmers at district and/or village level from the selected states and regions respectively to measure the impact of public funding by the governments on their social and economic conditions of public in general and farmers in particular.

With this letter, I hereby request your good office to provide him the authentic data/information for enabling him to accomplish his research. I assure you that, the data provided will be used by him for academic/research purpose only.

Looking for your favorable support and cooperation to him,

Pili S. mazowea
***FOR:* CONTROLLER AND AUDITOR GENERAL**