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An AgriFoSe2030 Final Report from Theme 1 - Social and economic dimensions of smallholder based agriculture and food security

Local and regional variations in conditions for agricultural and food security in Tanzania

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AgriFoSe2030

Agriculture for Food Security 2030
- Translating science into policy and practice

Today more than 800 million people around the world suffer from chronic hunger and about 2 billion from under-nutrition.

This failure by humanity is challenged in UN Sustainable Development Goal (SDG) 2: “End hunger, achieve food security and improve nutrition and promote sustainable agriculture”.

The AgriFoSe2030 program directly targets SDG 2 in low-income countries by translating state-of-the-art science into clear, relevant insights that can be used to inform better practices and policies for smallholders.

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Front picture: Woman irrigating crops. Photo: Pixnio, CC0.

Contents

Summary

This study was undertaken to investigate the local and regional variations in conditions for agriculture and food security by identifying the factors that are responsible for the disparity in agricultural performance in Tanzania. The study attempts to answer the following questions: What is the distribution of key crops grown and livestock kept in Tanzania? What are the current institutional arrangements and how are different stakeholders (local, county, national and international) involved in agenda setting for policy research? What has been the impact of policies, programs and strategies targeting local and regional variations in conditions for agriculture in Tanzania: what lessons have been learnt? What major gaps.

Based on the desk review employed for purposes of this study from documents at both global and country levels, the study reveals that there is a difference in agricultural and productivity among regions. It was also found that considerable amount of variation in production and productivity exists among the regions. For the food crops, the total cropped area and productivity is higher in the southern highlands compared to the central and northwestern regions part of Tanzania. There has been a slow and unbalanced agricultural growth among regions in Tanzania over the years. The factors range from variation in climate and topography, farming system, social cultural, and enabling physical infrastructure and access to markets.

It has been established that apart from agro ecological settings, the agricultural infrastructure across states is highly uneven in the country. Moreover, the disproportionate distributions of public and private investment in favour of agriculturally developed states are found to be responsible for wide disparity in agricultural performances in Tanzania which, in turn, is considered to be responsible for wide disparity in both agricultural production and the per capita domestic product across regions in Tanzania. There is a need for taking some immediate steps to put a check in this disparity and lop-sided growth of the regional economy and should be given special priority to bridge-up the immense development by the proper agricultural policy. Further to strengthen capacity building of various institutions to ensure efficient and effective in service delivery. Strengthen the capacity of the Ministry and local governments in overseeing implementation of agricultural activities.

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I also wish to thank all my mates Dr Rashid Suleiman, Dr Teddy Jumbe and Dr. Mutethiwa. You have been a wonderful family abroad and I appreciate each of you.

I therefore hope that my findings will contribute towards a better understanding of the problems of local and regional variations in conditions for agricultural and food security in Tanzania.

List of Acronyms

AMSDP	Agricultural Marketing Systems Development Programme
ASDP	Agricultural Sector Development Programme
ASDS	Agricultural Sector Development Strategy
BOT	Bank of Tanzania
CAADP	Comprehensive Africa Agriculture Development Programme
FAO	Food and Agriculture Organization
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GDP	Gross Domestic Product
Ha	Hectares
IFAD	International Food and Agriculture Developmet Programme
IFPRI	International Food Policy Research Institute
Kg	Kilogramme
LGAs	Local Government Authorities/Agencies
MAFAP	Monitoring African Food and Agricultural Policies
MAFSC	Ministry of Agriculture, Food Security, and Cooperatives
MDG	Millennium Development Goal
MKUKUTA	Mkakati wa Kuinua Uchumi na Kuondoa Umaskini Tanzania
MVIWATA	Mtandao wa Vikundi vya Wakulima Tanzania
NAWAPO	The National Water Policy
NBS	National Bureau of Statistics
NSGRP	National Strategy for Growth and Reduction of Poverty
NSGRP	National Strategy for Growth and Reduction of Poverty
OECD	Organization for Economic Cooperation and Development
PRSP	Poverty Reduction Strategy Paper
SACCOs	Savings and Credit Cooperative Organizations
SACCOS	Savings and Credit Cooperative Societies
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
TAHA	Tanzania Horticultural Association
TSh	Tanzanian shilling
URT	United Republic of Tanzania
WB	World Bank

1. Background information

1.1 Introduction

Tanzania is a country with a vast geographical area with widely divergent characteristics from one region to another. It is characterized with marked regional disparities in agro-climate, environmental, resource endowment and population density and uneven economic and agricultural development among various regions (URT, 2016a). Nevertheless, agriculture has all along been the most crucial sector of the Tanzania economy. Agriculture is not only contributing sector of income and employment but is also one of the major sources of foreign exchange earnings in Tanzania.

Over time Tanzanian agriculture has witnessed gradual transformation through technological innovations for food security and self-sufficiency. This fundamental change and application of agricultural innovations has changed the traditional farming of many farmers and brought about remarkable success in food grains production in Tanzania (Dirk et al., 2015). This achieved agricultural development has had a great impact to alleviate poverty in the Tanzanian economy. For instance from 2006 to 2012 basic needs poverty, which refers to the minimum resources needed for physical wellbeing, declined from 34.4% to 28.2% (World Bank, 2015). During the same time period, extreme poverty also decreased from 11.7% to 9.7%. The steady decline in poverty is strongly associated with agricultural growth since agriculture is the single largest employer of the country currently employing 65% of the population (BOT, 2018). Further, agricultural sector in 2015 and 2016, contributed to 29.0% and 29.1% of the total GDP respectively (BOT, 2017).

This success has been achieved from various effort by the government and non governmental organization for establishing various programmes for agricultural development throughout the country. The recent one being the ongoing Agricultural Sector Development Stratergies[1] (ASDS) (URT, 2017a).

Notable achievements have been realized in pursuit of the vision of the ASDS, which was to have a modernized agricultural sector by year 2025. the achievement include improvement in crop and livestock production and productivity in Tanzania which encompass the expanded small scale irrigation projects, establishment of livestock dipping, charco dams, shallow wells and feeder roads (URT, 2017b). Other positive interventions recorded include strengthening of extension services (e.g. farmer field schools, Ward Agricultural Resource Centers), supply of farm power, small scale agro-processing, and building human capacity among farmers, farmer organizations, private sector service providers, extension personnel and national level staff (URT, 2016b). In addition, a number of policy and institutional changes have taken place recently in the agricultural sector and sub-sectors. There is a multiplicity of agricultural projects outside, but congruent with the Tanzania Agricultural Sector Developmet Programme (ASDP). These include: the Feed the Future programme (USAID) (USAID, 2018), the Bread Basket Initiative (AGRA) (2015), and the Marketing Infrastructure Value Addition and Rural Finance Support Programme (IFAD) (IFAD, 2014). For livestock sector, the Livestock Sector Development Programme has been in place since 2008 aiming at improving the livelihoods of the livestock farmers (including pastoralists) by enhancing delivery of livestock inputs and services to livestock farmers and by improving its marketing systems for livestock products (Michael et al., 2018).

The above initiatives has led the country to increase self-sufficiency in food production, though poverty and hunger still exist due to uneven crop production among regions. Production of crops has shown considerable regional differences in production and consumption (Minot, 2010; Mkonda and Xinhua, 2017) in different parts of the country with some regions growing more than others (Carlos and Caballero, 2015; URT, 2016a). For instance the Southern and Northwestern regions of the country produce more food compared to other areas of the country (Table 1). Also when looking on food self-sufficient, there exist also regional differences in productivity (Mueller, 2011; Mkonda, and Xinhua,2017), for instance the southern, southwestern and western areas of Tanzania such Kagera, Ruvuma and Iringa regions have high food self-sufficiency and can run a surplus compared to other regions (Table 1). On the other hand, the northern highlands and the drought-prone central areas covering Dodoma, Singida regions have low food self-sufficiency and are fragile in terms of food security.

[1] Agricultural Sector Development Strategy is a guiding tool for implementation of the sectoral policies in Tanzania for the next ten years (2015/16 – 2024/25). It aims at operationalizing transformation of the agricultural sector into modern, commercial, highly productive, resilient, competitive in the national and international market

The evidence on the imbalance in Tanzania´s agricultural production has several dimensions. Among them is evidence of disparities across regions income levels and growth rates. For instance, from 2011 to 2015 there was a significant uneven in GDP per capita among the regions and zones of Tanzania. The Southern Highlands zone of the country recorded the fastest GDP growth rate of 15.4 percent, mainly due to increased agricultural output following favorable

Table 1: Food Production in 2014/15 and Food Requirement in 2015/16

Zone	Production	Requirement	Surplus/Deficit
Central	2,174,737	1,944,045	230,692
Dar es Salaam	57,630	1,297,114	-1,239,484
Eastern	2,308,697	1,567,598	741,099
North Western	4,872,266	4,038,881	833,385
Southern	2,100,054	1,965,865	134,189

Source: BOT, (2017)

weather conditions. Nominal GDP in Eastern zone grew by 15.2 percent, attributed to improvement in agriculture and expanding manufacturing activities while in the central zone the growth rate was 12.3% (BOT, 2017).

This divergence are puzzling given that there are no political barriers to migration from one place to another within the country, there is almost free trade, and a common set of national institutions. Therefore this disproportion in agricultural production is a subject of deep concern because local variation in agricultural production affects price stability and the consumers, and increases vulnerability of low income households to market.

The need for reducing regional gaps has been argued from various angles such as social justice, accelerating the growth of economy, maintaining national integration, political stability and utility (Kilima et al., 2008; Atkinson and Lugo, 2010). It suggests an important policies and institutional arrangement which needs to be widely explored.

Keeping these in view, a detailed study was undertaken to investigate the local and regional variations in conditions for agriculture and food security by identifying the factors that are responsible for the disparity in agricultural performance in Tanzania. To achieve the objective, the study attempts to answer the following questions:

1. What is the distribution of key crops grown and livestock kept in Tanzania?
2. What are the current institutional arrangements and how are different stakeholders (local, county, national and international) involved in agenda setting for policy research?
3. What has been the impact of policies, programs and strategies targeting local and regional variations in conditions for agriculture in Tanzania: what lessons have been learnt? What major gaps exist?

The answers to the above questions are expected to be useful in Tanzania, where agricultural sector could not perform well despites of various developmental efforts and the resultant achievements under different agricultural development programmes continued to persist. It would also be helpful in locating the issues in the existing policies in understanding the factors involved in formulating policies that will foster food security and rapid economic development of the different regions.

1.2 Methodology

The study was mainly depended on the secondary data sources. The review included a desk review of documents at both global and country levels including the review of the existing Literature from published reviewed journal articles and reports related to agricultural development and policy in Tanzania. Various documents were also reviewed, including past agricultural sector review reports, public expenditure reviews, Tanzania Agricultural Sector Development Programme (ASDP) joint implementation reviews, Monitoring and evaluation reports from agricultural and livestock ministries, research reports, and other technical reports. In addition, secondary data on agricultural policies,

agricultural output, processing and other economic indicators were obtained from relevant government institutions such as the National Bureau of Statistics and the Bank of Tanzania and international agencies such as the FAO, IMF, and the World Bank. The review involved a detailed cross-referencing of sources of information, analysis of data collected, and synthesis of information to respond to the outline of the report.

1.3 Structure of the Study

The remainder of the report is organized as follows. Section two presets an overview of the macro-economy and the agricultural sector in Tanzania, section three examines the distribution of key crops grown and livestock kept in Tanzania. Section four synthesizes the current institutional arrangements and how the different stakeholders are involved in agenda setting for policy and research, while section five covers the impact of policies, programs and strategies targeting local and regional variations in conditions for agriculture in Tanzania. Section six presents conclusions and policy implications.

2. Overview of the macro-economy and the agricultural sector in Tanzania

2.1. Main Features of the Tanzanian Economy

Tanzania‘s macroeconomic indicators showed robust growth in Gross Domestic Product (GDP) before and during implementation of the first phase of the Agricultural Sector Development Programme (ASDP 1) which started in 2006 (URT, 2016a). In recent years, GDP growth rate was between 6.0% and 8.1% between 2006 and 2014 at 2007 constant prices. These levels of GDP growth happened at a time when agriculture sector growth, except for 2008, was far below GDP growth (Figure 1). On average, the service and industry sectors exhibited stronger growth rates than agriculture. The average growth rate for the agriculture sector during the period 2006–2014 was 3.9% per annum, and that of the service and industry sectors was respectively 8% and 7.8% for the same period. From 2006 to 2012, the share of the agriculture sector in total GDP decreased from 27.7% to 23.2%, while the shares of industry and service sectors increased from 20% to 22%, and from 46% to 49% respectively during this period (World Bank, 2017).

Given the decline in the agriculture sector‘s share of GDP and its contribution to real GDP growth, it is apparent that the robust economic growth is not a shared prosperity. On the contrary, those who earn their livelihood from agriculture and who happen to live in rural areas are trapped in poverty.

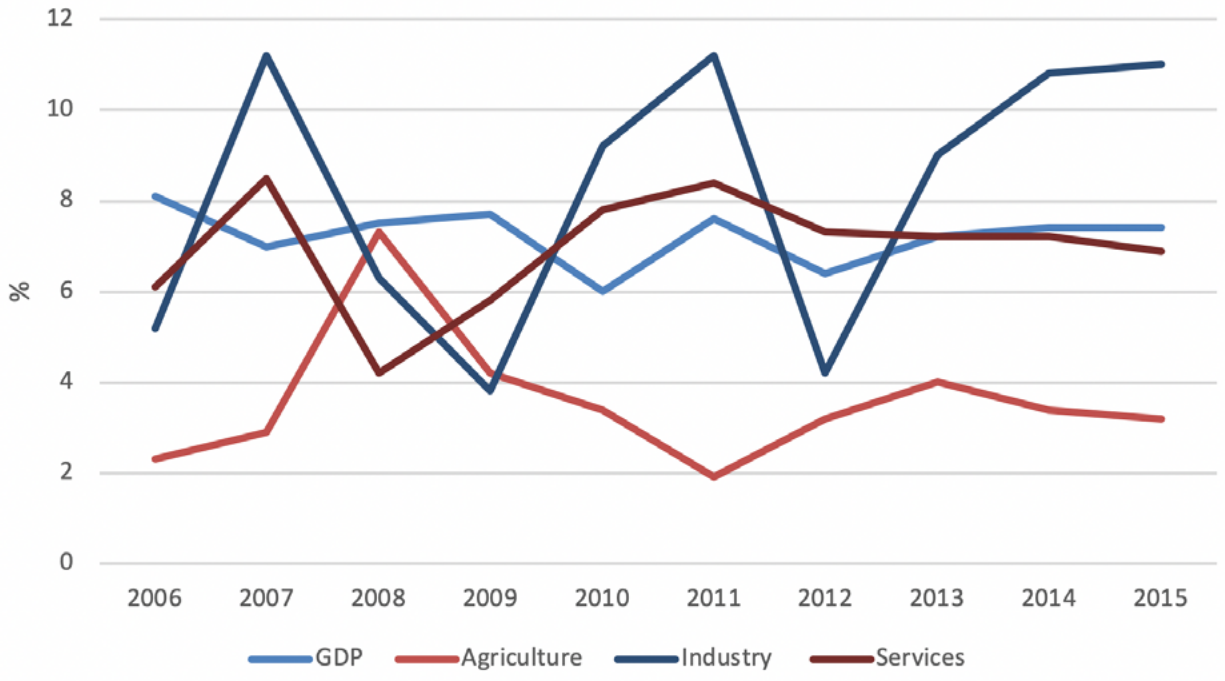

Figure 1: Growth rates of total GDP, agriculture, industry and services, 2006-2015 (%). Source: (BOT, 2016)

2.2. Agriculture in the Economy

Agriculture is the main part of Tanzania's economy. As of 2016, Tanzania had over 44 million hectares of arable land with only 33 percent of this amount in cultivation (URT, 2017a). The agricultural sector in Tanzania is characterized by traditional farming methods with low levels of technology, low utilization of modern inputs and inefficient resource allocation (URT, 2016b). Also characterized as a smallholder business, with farm sizes ranging in size from 0.9 to 3 hectares, dedicated to subsistence with limited marketable surpluses. A close scrutiny of the sectoral growth presented in Figure 2, shows that the agriculture's annual growth rate has been largely stagnant over the past 10 years, following persistent low and declining productivity. This owes to low utilization of improved farm technologies including fertilizer and improved seeds; a shortage of mechanical inputs; limited water for irrigation; poor reach of extension, research, technology (Trevor and Lewis, 2015).

Despite the shortfalls, agriculture remains the main sector in Tanzania in terms of its size, contribution to GDP, generation of employment and export earnings. Sector performance between 2006 and 2015 varied between sub-sectors, with all crops contributing up to 71 percent to agricultural GDP, and growing at a rate of 4.6 percent per annum (NBS, 2016). Livestock sub-sector growth rate averaged 3.2 percent (against 4.2 percent for the whole sector) (Fig 2). Also over this period the relative contribution to agricultural GDP by crop, (a figure on growth rate is needed) livestock, forestry and hunting, and fisheries in recent years averaged 18, 5, 3 and 1.4 percent, respectively (Figure 2). It was noted that, among crops, the best performance was recorded in export crops such as sugar, tea and tobacco, which recorded growth rates of almost 10 percent per annum (NBS, 2014a). However, these crops are concentrated in specific regions such as Tabora, Iringa, Morogoro and Rukwa (URT, 2016c). These crops they occupy only about 10 percent of cultivated land, but they contribute 70 percent of export earnings. Fisheries industry has been growing at around 5 percent per annum.

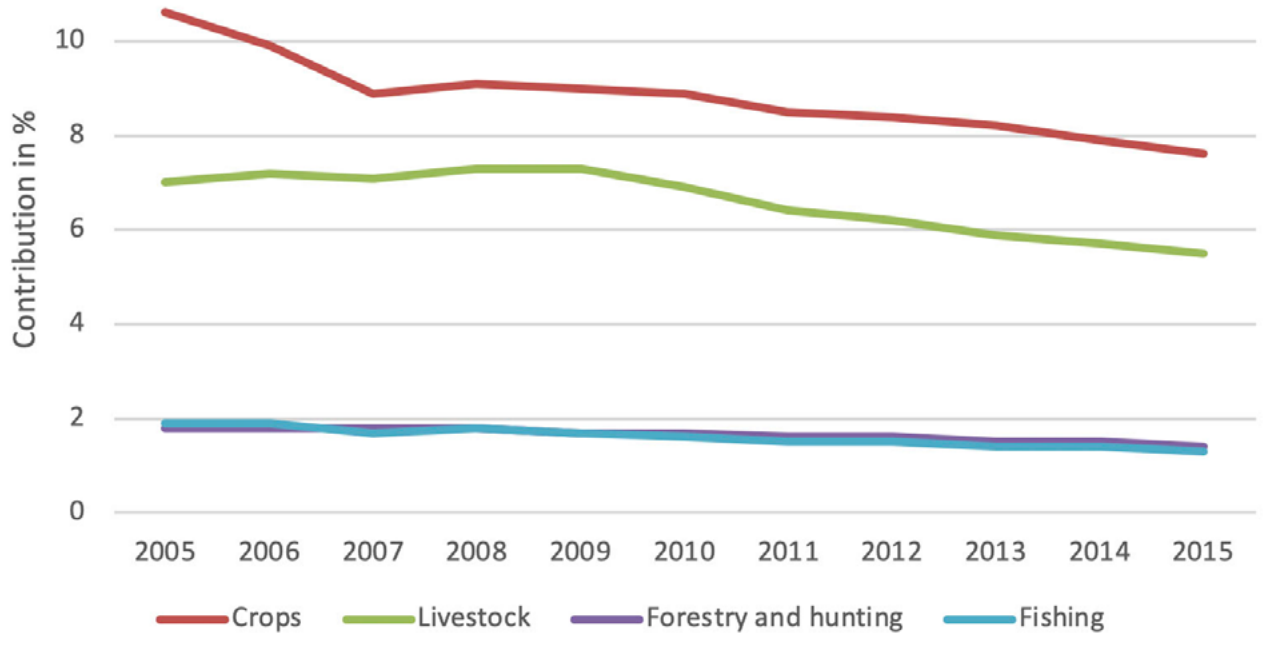

Figure 2: Decomposition of the agriculture sector (% share). Source: BOT, (2017).

For the Livestock subsector, according to Tanzania livestock master plan (2018), livestock sector contain about 21.3 million cattle, 15.2 million goats and 6.4 million sheep (Stephen et al., 2018). Other livestock kept in the country include 1.9 million pigs, 35.1 million indigenous and 23 million exotic chicken. The country has the third largest cattle population in Africa after Ethiopia and Sudan. About 90% of the livestock population is of indigenous types which are known for their low genetic potential in milk and meat production (URT, 2016b).

The low contribution has been associated with low livestock growth rates, high mortality rates, low production and reproductive rates, low off-take rates and poor quality of the final products from the industry (Engida

et al., 2015). However, it is important to note that contribution of livestock is not limited to its share in GDP. Other contributions are through national food supply and food security, source of income to the smallholders (which may not be captured in the national accounts), and inflation-free store of value. Further, the sector provides manure and animal draught power to the crop production sub-sector.

2.3. Food Security and Self-Sufficiency

Sustained by steady growth, over the past two decades Tanzania has made significant progress in economic, social and human development. This, however, has not benefited all sectors of society. Despite the country currently produces enough food to feed its population, the poorest and most marginalized families have limited access to it (André et al., 2013). Food production has remained low, failing to meet household and national requirements. Furthermore, the dependency on agriculture as the mainstay of the economy has made the Tanzanian economy more vulnerable to both external and internal shocks, given the lack of other important productive sectors such as manufacturing (Leyaro and Morrissey, 2013). As a result, the food security situation in Tanzania varies from one region to another and from one season to another (OECD, 2013).

Hence, famine in Tanzania is a largely seasonal. Climate-dependent phenomenon as food shortages, and or subsequent acute famines, are generally linked to weather-related circumstances. Up to 9% of the Tanzanian population experiences annual food shortages, most commonly between October and February every year (ESRF, 2015a). Periods of heightened food shortages following a shock, like a severe drought, are most pronounced in regions with unimodal rains, right before the start of the rainy season in December (CFSVA, 2012). The weather-related, largely seasonal, nature of food shortages in Tanzania means that year-to-year pockets of food shortages occur regardless of the country's ability to feed itself in terms of production potential. In 2011 for instance, the Ministry of Agriculture, Food Security and Cooperatives (MAFSC) declared that a total of 56 (out of 169) administrative districts in 16 (out of 30) regions, mostly in the bimodal North East, experienced acute food scarcity because of extreme drought. During this period 7 districts in three different regions were in need of emergency food assistance (URT, 2011a). In June 2012 again, nine regions of Northern and Central Tanzania, namely Arusha, Manyara, Kilimanjaro, Shinyanga, Dodoma, Iringa, Mwanza, Mara and Tabora faced chronic and transitory food insecurity due to poor harvesting (Makoi, 2017).

Ideally, it is not only these climatic shocks themselves that cause hunger, but rather the absence of 'buffers', and the lack of resources to prevent these shocks from having an impoverishing effect. Food insecurity is intrinsically linked to poverty and despite constant overall economic growth over the past decade, Tanzania remains one of the poorest countries in the world and currently ranks 154th out of 189 on the Human Development index (UNDP, 2018). According to 2011-2012 Household Budget Survey (HBS), 28.2% of Tanzanians live below the poverty line. Although this indicates some improvement since the 2007 HBS poverty incidence of 33.6% (ESRF, 2015b).

According to the 2015-2016 Tanzania Demographic and Health Survey (TDHS), 34.4% of children under the age of 5 years are stunted or short for their age, a condition reflecting cumulative effect of chronic malnutrition. About 5% of children are wasted or too thin for their height, which reflects the level of acute malnutrition while, at the other extreme, 4% are overweight or over-nourished and 14% of children are underweight or too thin for their age (URT, 2016c). However, data trends show that the prevalence of stunting and underweight in the country has been steadily decreasing since 1996. In contrast, the prevalence of wasting has remained almost unchanged between 1999 and 2016.

In relation to regional variability, the prevalence of stunting varies per regions where by it is relatively high in the Southern Highlands (44.7%) and South West Highlands (43.1%). The regions with high prevalence of stunting are Rukwa (56.3%), Njombe (49.4%), Ruvuma (44.4%) and Geita (40.5%) while the only region having the lowest prevalence (14.6%) in Tanzania mainland is Dar es Salaam (URT, 2017b). All three nutritional status indicators are highest among children in the lowest wealth quintile and lowest among children in the highest wealth quintile. It is also worth noting that, the most affected areas are the main food crop production regions. Overall, 5% of children are wasted. The regions having high prevalence of wasting include Manyara (6.4%), Geita (6.2%), Morogoro (6%) and Kigoma (6%). Dar es Salaam and Njombe have the lowest prevalence of wasting: Dar es Salaam (1.2%) and Njombe (1.3%) (URT, 2016c).

3. Distribution of crops grown and livestock kept in Tanzania

3.1 Distribution of Crops Grown

To have self-sufficiency in food is one of the most important objectives in Tanzania. To achieve this objective various programme and strategies have been formulated and implemented (Refer section 4.0). This effort led to a significant acceleration in growth of output and productivity in agriculture in Tanzania. However, the gains from productivity have been uneven across regions in the country. As from section (1.0) several aspects have been pointed out for the unevenness and variation in agricultural advancement among regions in Tanzania. They are variability in weather condition across regions, varied agro-climatic factors, varying levels of resource base, irrigation facility and varied infrastructural development across regions and high population growth (URT, 2011b). The essential question is to what extent the above factors are responsible for creating divergence in agricultural development.

Having a greaty diversity of topographical features (that leads to variation intemperature, humidity and rainfall), Tanzania's farmers grow variety of crops. The most common food crops in Tanzania are maize, cassava, sweet potatoes, bananas, sorghum, and paddy. While cash crops include coffee, cotton, sugar cane, sisal and tea (URT, 2011b). Maize is produced across the country, with a relative concentration in some regions, and is the main crop for the majority of households (more than 5.1 million) (URT, 2013; FEWSNET, 2018). It is estimated that, about 82% of Tanzanian farmers grow maize, 24% grow cassava, 16% grow rice, and 12% grow sorghum. Of those farmers that grow maize, 85% are smallholders, 10% are medium farms, and the remaining 5% are large farms. The largest producing regions (Shinyanga, Mbeya, Iringa, Rukwa, Tanga, and Manyara) and Ruvuma are also surplus areas, with per capita production 20 percent above the national average as presented in Figure (3 and 4). Rice farmers, on the other hand, are 94% smallholders and only 6% large farms.

It is also found that, generally, mixed maize production is common in central semi-arid regions whereas the northern zones provide better conditions for coffee, maize, and tea. Coffee and tobacco production is predominant in the southern and western zones, and the Lake Victoria area is suitable for cotton (Kimaro et al., 2009).

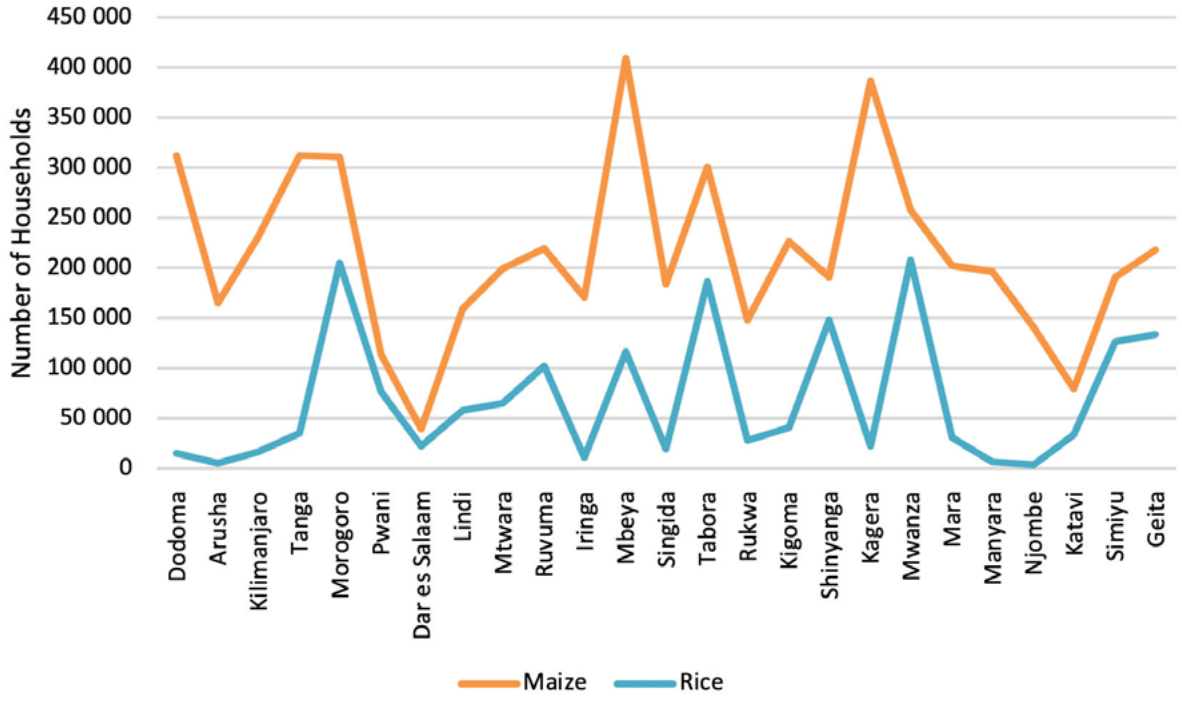

Figure 3: Total Number of Households Growing maize and rice for 2011/12 Agricultural Year by Region. Source: NBS, (2014a)

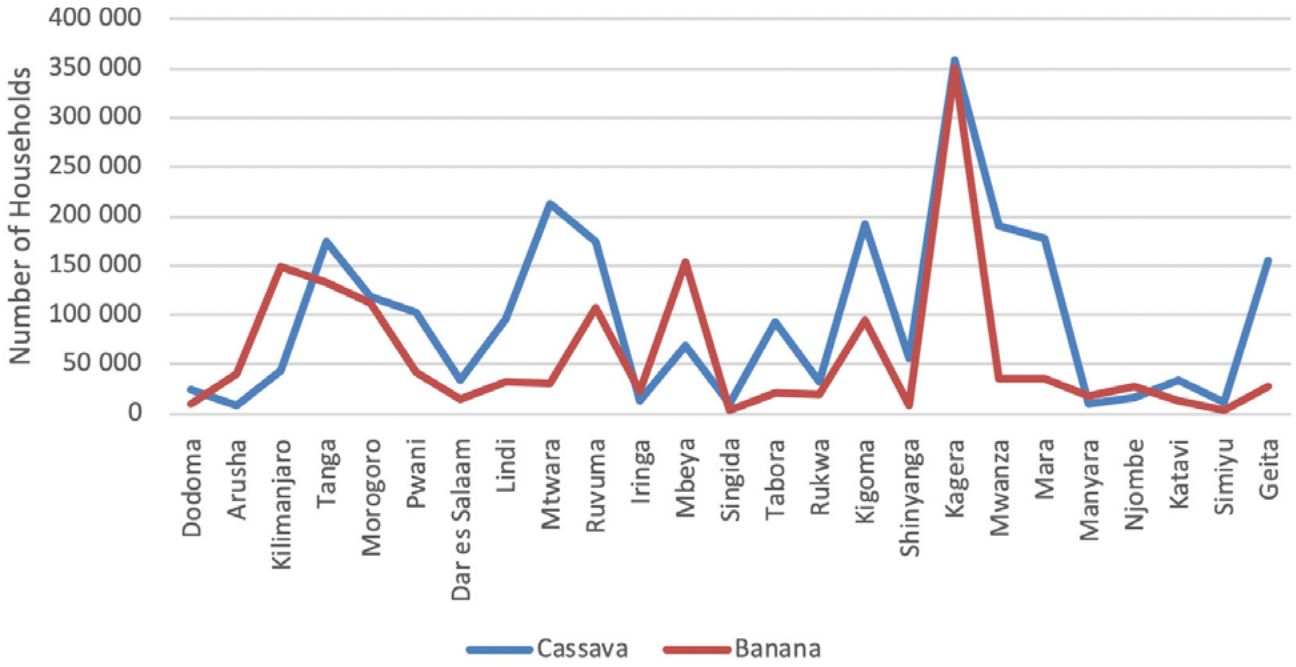

Figure 4: Total Number of Households Growing cassava and banana for 2011/12 Agricultural Year by Region.
Source: NBS, (2014a)

3.2 General Factors Contributing to Regional Variations in Agricultural Development

There are multiple factors that influence the farmer's choice of crops in Tanzania. They are categorized in to physical factors, economic factors, crop profiles, (including crop yield and pest resistance); and resource availability such as machinery and fertilizer (Anderson and Kay, 2011).

3.2.1 Climate and topography

Tanzania has a tropical climate but has regional variations due to variation in topography. The altitude ranges from sea level to over 1,600 meters altitude in the west part of the country while the Kilimanjaro Mountain located in the north eastern part has an altitude of 5,895 meters above sea level (Figure 5). Much of the country lies above with 1000 meters altitude with many areas above 1500m in the centre and north (GCAP, 2011). The coastal areas and southern areas are generally lower altitude. The northern borders lie almost on the equator while the southern border is at around 12°S. This places Tanzania directly in the tropics climatologically and hence the climate is entirely driven by tropical processes.

In the highland areas, temperatures range between 10 and 20 °C (50 and 68 °F) during cold and hot seasons respectively. The rest of the country has temperatures rarely falling lower than 20 °C (68 °F) (Hamisi, 2010).

Rainfall varies significantly from year to year, with an average rainfall of 400mm to 2,500mm (Kijazi and Reason, 2004). It also varies depending on the region where as the coastal areas and northern highland rainfall can exceed 1000 mm annually, while the northern and interior areas of the country get only 500-700mm annually. Some regions have two rainy seasons, the big rains in March to May (known as Masika in Kiswahili) and the short rains (also Known as Vuli) from October to December, while other regions have one single rainy season from November to April called Msimu (Hamisi, 2010).

Apart from the rainfall distribution, wheather variability influences crop production significantly. Thus, in most cases successful production depends on farmers' ability to make multiple decisions on key production variables, which sometimes have multiple dependent attributes. (Sarris and Karfakis, 2010). As a consequence, unpredictable rainfall is a major source of income uncertainty for Tanzanian households. Inability to manage this income risk has been found to hurt their welfare and investment decisions.

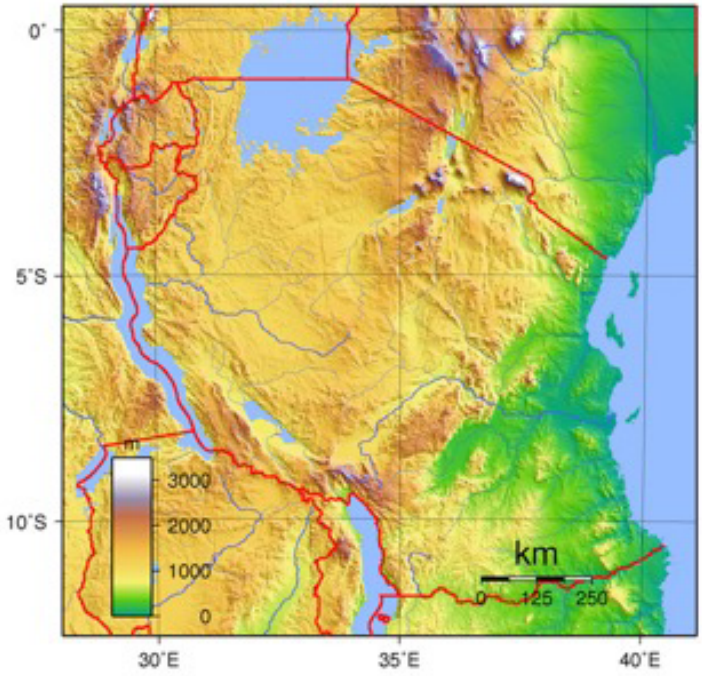

Figure 5: Detailed physical (elevation) map of Tanzania. Source: http://www.vidiani.com/physical-map-of-tanzania/

3.2.2 Farming systems

Tanzania has a considerable variation in farming systems due to the large variation in climatic and agro-ecological conditions. According to Golenco et al., (2013), there are ten major farming systems characterized by diverse livelihood activities, with agriculture-based livelihood activities being dominant across all of the systems. Agro-ecological zones are geographical areas exhibiting similar climatic conditions that determine their ability to support rained agriculture. FAO on the other hand defines Agro-ecological zone (AEZ) as: a land resource mapping unit, defined in terms of climate, landform and soils, and/or land cover, and having a specific range of potentials and constraints for land use. The country is divided into Eastern, Northern, Southern, Southern Highlands, Western, Central, and Lake Zones (Figure 6). Due to changes in regional administrative boundaries, some regions were not present during the construction of the Agro-ecological map.

The FAO identifies eight main farming systems in Tanzania which include: maize mixed; root crop; coastal artisanal

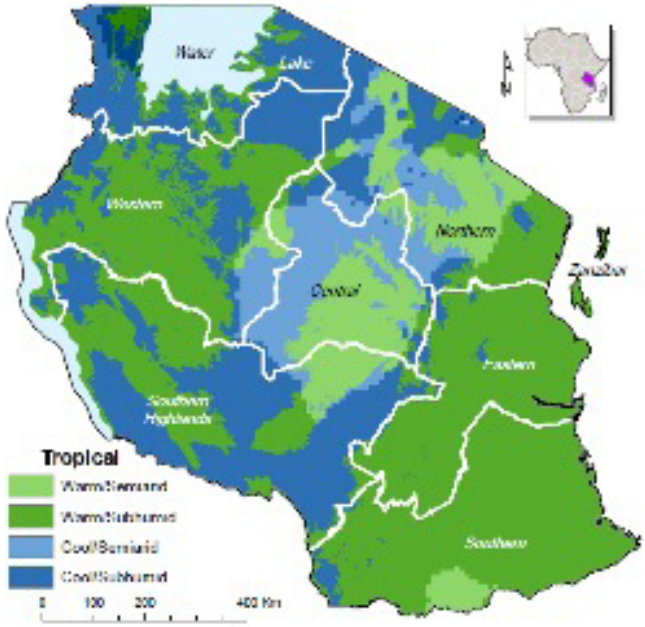

Figure 6: A map of Tanzania showing agroecological zones. Source: Catherine et al., (2017).

fishing; highland perennial; agro-pastoral millet/sorghum; tree crop; highland temperate mixed; and pastoralism (Karina et al., 2011).

It has been argued that the magnitude of the effect of changes in livelihood patterns on poverty among smallholder farmers in Tanzania varies across the farming systems smallholder farmers in farming systems with more diverse sources of livelihood are less affected than those with limited sources of livelihood (Mdoe et al., 2015). Given differences in resources, livelihood patterns, and constraints among the farming systems, farming system-specific rather than countrywide policy interventions will be required to improve agricultural productivity, enhance livelihoods, and reduce poverty levels in Tanzania.

3.2.3 Institutional factors

Institutional factors influencing crop productivity include farmers' access to extension services, credit, market, farmers' organization and mass media (NBS, 2017). Access to credit is regarded as one of the key elements in raising agricultural productivity. Thus, households with access to credit may be of help to farmers in obtaining the capital required for adopting the higher profit production technologies and therefore increase productivity (Wachira, 2012).

Extension services reflected by the number of extension contacts either through farm visits made or training sessions received prior to and during production season influence crop productivity (Anyiro and Oriaku, 2011). This is because farmers who get in touch with the extension agent are likely to get the right information not only on a technology but also its profitability.

Since 2007, the government of Tanzania has implemented a range of policy measures to rejuvenate the extension system and improve the agricultural service delivery to farmers. One measure has been to increase the number of agricultural personnel to work with farmers at village level. The results have been positive with doubling of extension staff in some regions and districts since 2007 (ASHC, 2015).

The government target was one extension officer to every village in Tanzania by 2015 (MAFSC, 2011), corresponding to 15,802 extension officers.The process started in 2007 by increasing enrolment of students in the Ministry of Agriculture Training Institutes and private institutes to about 3,500 students each year. In 2012, the most recent data available,there were 10,891 extension officers in Tanzania: 6,925 crop-focused and 3,966 livestock-focused (USAID,2018).

3.2.4 Adoption of improved farming technologies

Soil fertility is considered as one of the major limitations in maize production in Tanzania as evidenced by very low maize yields ranging between 0.9 to 1.4 t ha-1compared to the potential of most released varieties of about4 to 5 t ha-1 (Lyimo, 2014). There is a great variation in the use of Inorganic fertilizers in Tanzania and in southern regions the application is higher compared to other regions (Figure 7). The fertility status of the soils in many areas in Tanzania has not been assessed and monitored, so the amounts of nutrient supplements needed per ha to replenish the nutrients lost through various processes like uptake by plants are not known leading farmers to rely on their experiences to estimate the amounts of fertilizers to apply, particularly on maize. It is also noted that, about 0.7% of farmers in Tanzania use an average of 8 kg ha-1of inorganic fertilizers in maize production (Kamhabwa, 2014). This situation has led to higher variability in the use of inputs among the regions (MAFAP, 2013). Some farmers in Tanzania have the notion that their land is fertile and does not need chemical fertilizers for cereal crop production (Tanga, Morogoro, Dodoma and Singida regions (Nkonya and Mwangi, 2004; Moshi, 2017).

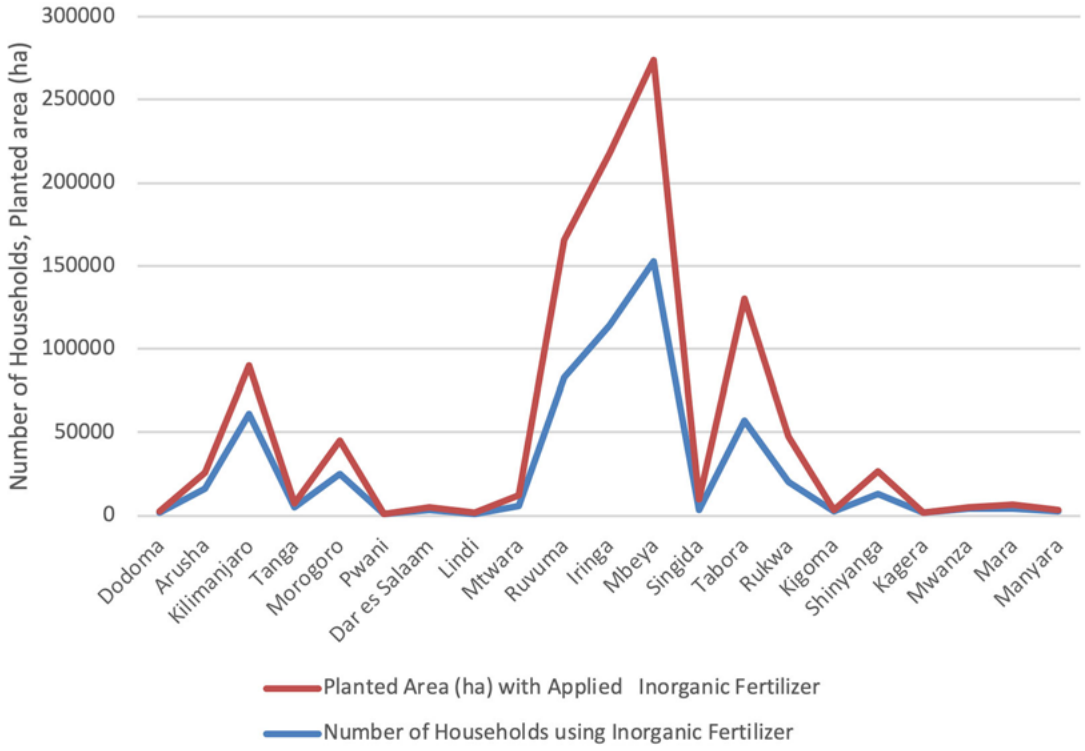

Figure 7: Area planted with applied inorganic fertilizer and number of households using inorganic fertilizer. Source: FAO, (2018)

Meanwhile also, there is a higher variability in the use of modern or improved seed varieties (Figure 8). Study by Moshi (2017) noted that the Main reason for the higher variation in using improved maize seed in Tanzania was lack of income to purchase improved seed varieties, susceptibility of the improved varieties to pests and diseases, and lack of information or knowledge about the varieties, and their availability and mistrust of input dealers. It is also believed that some retailers engage in unethical advertising practices or selling dyed grains under the name of known and trusted genuine varieties at cheap prices (Langyintuo et al., 2008). By doing so, they not only cheat farmers but also permanently damage the loyalty farmers have built for the variety over the years. Such practices go against the seed act 2007, which clearly ban import, export, produce, process, distribute or sell seeds unless such person/ company is registered (as stipulated in section 14 of the act) (Moshi, 2017). The implication is characterized by weak measures to protect genuine seed producers and farmers. Poor knowledge and lack of information on which type of

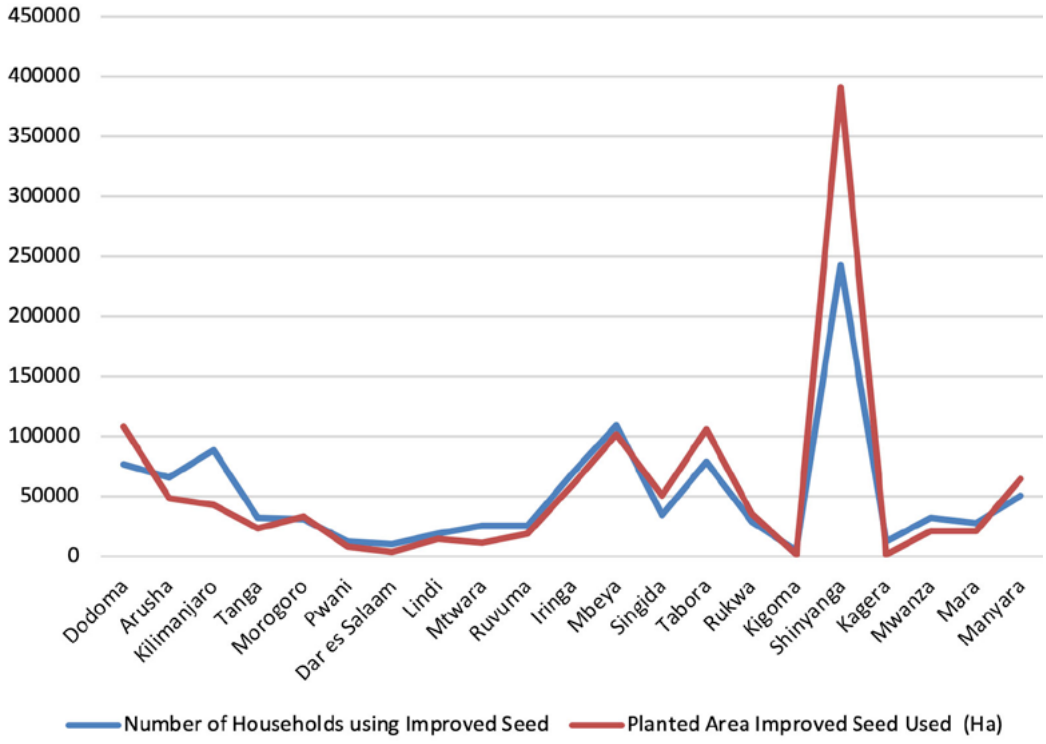

Figure 7: Area planted with applied inorganic fertilizer and number of households using inorganic fertilizer. Source: FAO, (2018)

improved seed varieties can be used in respective regions or agroecological area put some farmers in to dilemma on the appropriate seeds to use rendering them using local seed (Lyimo et al., 2014). Lack of awareness stems from the fact that numerous varieties are released into the market without adequate farmer education. Giving farmers options by putting on the market different varieties is a good idea but not when they bare unfamiliar names and their characteristics' details/information are scanty. Further it has been revealed that some of the seed retailers are not sufficiently knowledgeable about the characteristics of the seed they carry in their stores to be able to educate farmers who buy the seed. This situation discourages adoption of high yielding seed varieties. Also irrigation activities varies widely in Tanzania (Figure 9). 3.2.5 Lack of appropriate storage facilities

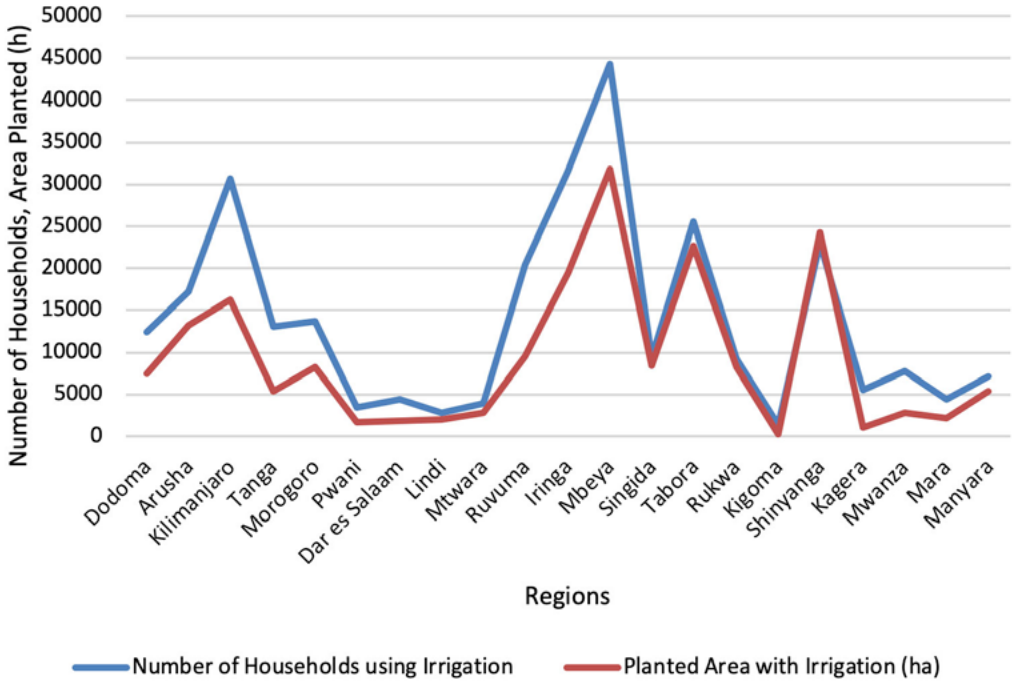

Figure 9: planted Area with irrigation and number of households using irrigation. Source: FAO, (2018)

Adequate storage facilities constitute another constraint to both marketing and food security. Large quantities of agricultural commodities produced by farmers tend to rot away unmarketed, while the smallholder farmers do not have the technology for timely consumption (Minot, 2010). This scenario is a common case for oranges in Tanga region, and tomatoes and onions in Singida region during peak period. When there is a bumper harvest it becomes more of a curse to the farmers than blessing. For instance 2015, the National Food Reserve agency (NFRA) was not able to buy the maize produced in the southern region of Tanzania. The condition led to farmers not to be able to recover the production cost. Similar scenario occurred in 2016/2017 season for pigeon peas where by the price dropped from 2500/= TSs in 2015/2016 to less than 300/= TSh in 2016/2017.

3.2.6 Poor marketing linkage

Key constraint on the output side to raising productivity of smallholder farmers in Tanzania has been the inability of most them to get linked into the reliable market. Most farmers produce without knowing the price they would come to sell their produce. This leads to price fluctuation around the year and between regions. As many farmers do not have direct link to the market, the middle men are the ones who link the farmer to the buyer leading to middle men taking a lion's share of the value of the crops sold. Good examples include cassava producers in the coast region in which the farmer has no chance to meet with the buyer instead it is the middlemen who negotiate price for both of them (Thorntorn et al., 2009).

3.2.7 Poor rural infrastructure

Poor infrastructure continues to impede agricultural activities in Tanzania. Most rural areas have poor road conditions which increase the transportation cost in the crop value chain. The key challenges are inadequate and poor conditions of the market facilities and transportation systems, including road and rail. For instance Mbeya, Rukwa, Ruvuma, and

Iringa regions account for 35-40 percent of Tanzanian maize production (Lyimo et al., 2014). But due to poor road infrastructure, make it very expensive to transport the the maize to regions with less food productions (URT, 2013). The road system, which is the most important for market development in terms of distribution of inputs and output to and from farms, is the most serious infrastructural bottleneck facing agricultural development. This has led to price variation of inputs among regions as well as variation in output price. It is also part of the reason why there can be food shortage in some parts of the country while there is a plenty of food crop in other regions (Kilima et al., 2008).

3.2.8 Lack of Access to Support Services

The development of competitive markets requires the existence of supporting market institutions and adequate provision of essential public goods and services. The sector requires financial services, technological and information services, marketing services and capacity building through training. Availability of formal agricultural credit for production has been limited. The main constraint to credit expansion is risk associated with poor credit recovery. Commercial bank lending for agricultural production is extremely limited, and with the collapse of the cooperative unions, farmers find it difficult if not impossible to access some reliable form of formal credit to facilitate purchase of production inputs. Despite this fact, in Tanzania accorting to URT, (2016b), agricultural financing (including livestock) from commercial banks in terms outstanding lending is gradually increasing and equivalent to 10% of the total, reaching to 1 trillion TSh. The public financial service includes TIB-agricultural window and the Tanzania agricultural development bank (TADB). Private provision of support services such as support from Private Agriculture Sector Support (PASS) Trust established in 2000, Vision Fund International, Formal and informal MFIs, financing to SACCOS, also support the agricultural economy of the smallholders farmers (URT, 2016a). However due to the nature of the challenges and risks of agricultural production and marketing, financial institutions are particularly reluctant to assume the specific risks in agriculture, i.e. the uncontrolled production and market risks (IFAD, 2014).

3.3 The Livestock Sector

Tanzania is the third country in Africa with large numbers of cattle after Ethiopia and Sudan. According to the National Bureau of Statistics (NBS), Tanzania had 25.8 million cattle by early October 2015 (NBS, 2016). Livestock is a popular asset among Tanzanian households where by 4.6 million or 50% of the 9.2 million households in the country report to keep livestock (NBS, 2013). Livestock populations in the country have been increasing steadily over the years. According to the report released in the year 2011 by National Bureau of Statistics, the livestock populations in Tanzania are estimated at 22.8 million cattle, 15.6million goats, 7.0 million sheep, 2.01 million pigs, 35.5 million indigenous chickens and 24.5 million improved chickens (NBS, 2014b). Further, more than 90% of the livestock population in the country is of indigenous types, having characteristic of low production and productivity but well adapted to the existing environment and resistant to diseases (URT, 2016b).

Livestock keeping in the country has been categorized into two major production systems namely intensive and extensive. The intensive system, though limited in size, has been receiving more emphasis in investment and improvement because of its contribution to the market oriented economy. More than 90% of the national cattle herd is found in the traditional sector, in which over 95% of the cattle originate from the small East African Zebu (EAZ) known as the Tanzania Shorthorn Zebu (TSZ). The TSZ cattle are characterized by low production coefficients compared with exotic cattle (Bos taurus) breeds (Ojango et al., 2016). Extensive system is mostly agro-pastoralism and pastoralism. Pastoralism is concentrated in the northern savannah plains where climatic and soil conditions do not favour crop production (Arusha, Manyara) while agro pastoralism is found in low rainfall of western (Shinyanga, and Tabora) and central (Dodoma and Singida) (Msalya et al., 2013).

Other areas with agro-pastoral characteristic include Lake, Eastern and Southern highland zones. Five leading regions with their cattle numbers in brackets are Tabora (2.74 million), Manyara (2.16 million), Mwanza (2.08 million), Mara (1.88 million) and Shinyanga (1.88 million) (Figure 10). Whereas livestock ownership is widespread, in aggregate numbers, ownership is highly concentrated, with the top 20% of livestock keepers holding over 80% of total livestock assets.

Livestock provides livelihoods support to an estimated 60% of all rural households, earning an average of over 20% of their income from livestock (Mwambene et al., 2014). Animal breeding provides a variety of benefits to rural communities, including risk mitigation, food security and improved nutrition. The type and quantity of livestock held depends heavily on the wealth of the household. The regional variation in livestock keeping is presented in Figure (10 and 11).

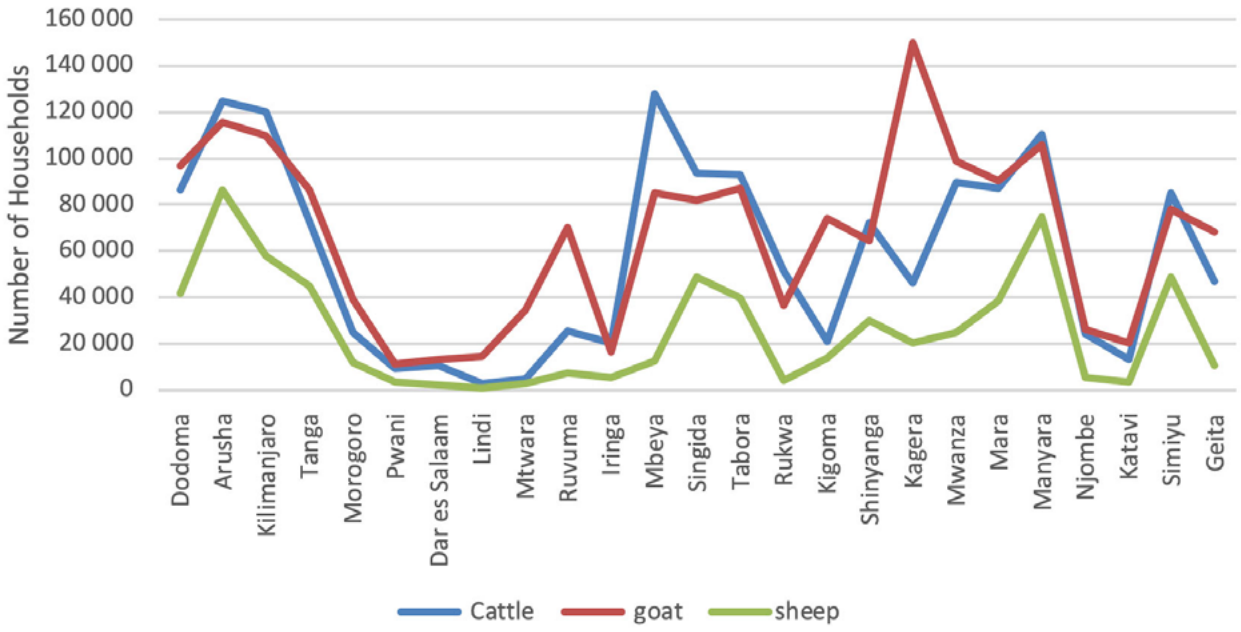

Figure 10: Number of households keeping livestock during 2011/12 agricultural year.Source: NBS, (2014a)

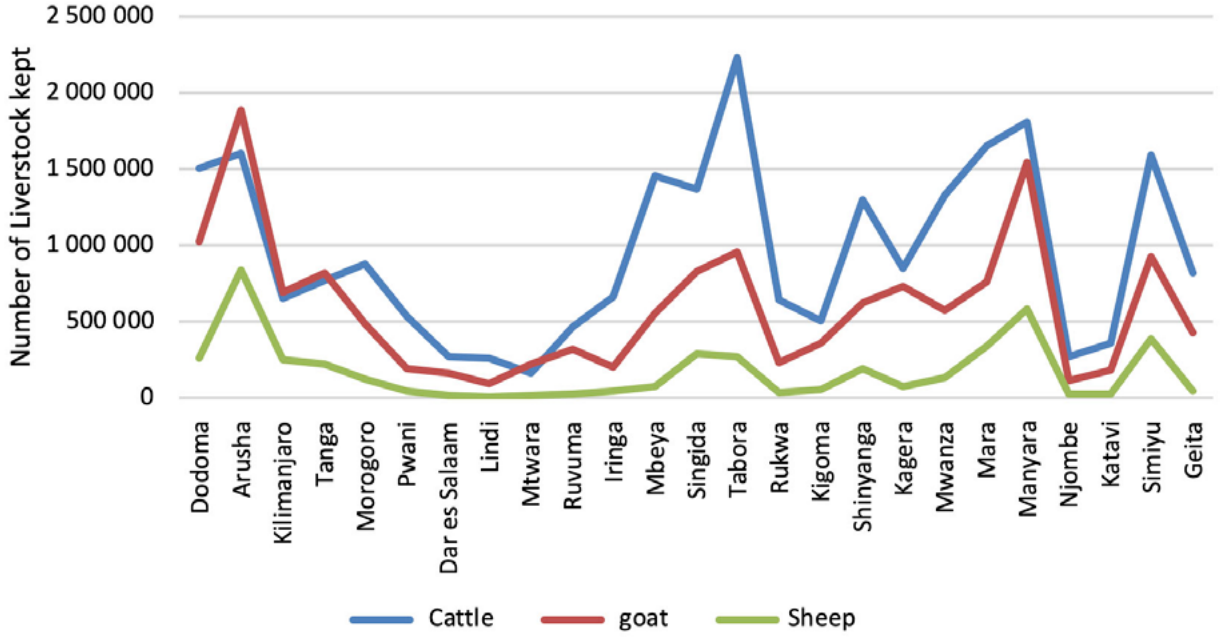

Figure 11: Number of livestock kept during 2011/12 agricultural Year. Source: NBS, 2014a.

Land, water and rangelands are the main resources which support this vast system of livestock production. Mwambene et al., (2014), noted that increasing land scarcity and conflicts of interest between different land users in have implied that huge numbers of people have migrated in search for pastures elsewhere. The effects of this are aggravated by the fact that the majority of people cultivating in these areas cannot afford to use any inputs to maintain and or improve soil fertility (Mwamfupe, 2015). Other implications of the spread of cultivation into marginal areas, is that access to grazing areas is consequently diminishing (Mattee and Shem, 2006). An increasing number of land conflicts are now occurring between different interest groups and between various types of land use (Nelson et al., 2012).

3.4 Reason for the Regional Variation of Livestock

3.4.1 Shorttage of Enough Pastures

The natural pastures in semi-arid central Tanzania are characterized by very rapid growth during the short rainy season, resulting in early maturity and rapid deterioration in nutritive value as the dry season sets in (Mbwambo et al., 2016). Therefore, for a period of six to nine months of the year, feeds available to the ruminant livestock are in short supply and whatever is available is of very low quality. With the existing land tenure system, the livestock compete for the available pasture. Such a system of grassland utilization leads to a high degree of overgrazing and overstocking with the resultant effect of land degradation.

Currently, pastoralism production system in Tanzania has been facing shortage of natural pastures and water for livestock (Sangeda and Malole, 2014). Gradual climate change and an increase of both human and livestock populations in both production systems have been attributed to these challenges.

Further, the establishment of new and expansion of existing game reserves by the government and other land acquisitions by investors have further implicated to amplify the shortage of grazing and cropping land in the country. All these challenges have therefore, been forcing agro-pastoral/pastoral communities to migrate into different regions of Tanzania to search for pastures and water since 1970s (Mwambene et al., 2010).

For instance, the major pastoral communities from North western part of Tanzania have been migrating with livestock to the Lake to the Eastern and Southern region of Tanzania to search for good pasture and water. for Instance a larger group migrated to Rukwa basin, and later to Usangu and Ihefu wetlands (Mwambene et al., 2014). Also large migration has been witnessed from Arusha-Manyara region to Tanga, Morogoro and the Coast region (Chachage, 2010; Mwamfupe, 2015). All these movements were aimed at searching for pastures, cropping land and water. Other factors includes: poor animal nutrition, animal diseases, water shortage and the low genetic potential of the indigenous cattle. The specific priority constraints identified to influence livestock production in Tanzania include the following:

3.4.2 Shortage water

Inadequate access to water for both human and livestock use during the dry season is identified as a priority problem in cattle production. These movement has been destroying some catchment areas and protected wetlands. Furthermore, inadequate recognition of pastoralism and the pastoral way of life in national policies has resulted in a great deal of conflict, mainly over land issues. This, in turn, has contributed to a negative state perspective on the pastoralist culture, way of life and its value as an economic activity.

Mussei et al., (2013), pointed out that, despite these livestock movements to cope against feeds and water shortages, most of the national policies were and still are based on the implicit notion that agro-pastoralism/pastoralism is not the most efficient use of land. Consequently, even in their new destinations, pastoral land has continued to be converted to farm land by small and large scale crop farmers and to conservation in the form of game parks, game reserves and game controlled areas.

In this context, pastoralists/agro-pastoralists are persistently forced to move to marginal areas along the periphery. As a result, land degradation along the shrinking pastoral areas due to overstocking has been increasing and conflicts with farmers and game reserve authorities are emerging frequently.

3.4.3 Animal diseases

Although Tanzania's rangeland resources is a major asset, 60% of this area is infested with tsetse fly and, as a result, animals are concentrated in the arid and semi-arid centre and north of the country. Improved livestock production has been hampered by poor health and very high mortalities. The most predominant livestock killer diseases were singled out as tick-borne diseases, especially East Coast fever (ECF) and anaplasmosis (Mdetele et al., 2014). Trypanosomiasis is endemic in areas bordering the tsetse fly belts of Arusha and Iringa regions. Also, repeated outbreaks of viral Foot and Mouth disease (FMD), bacterial (anthrax and black quarter) diseases and end parasites (gastro-intestinal helminthes) are widely distributed in the area (Kivaria, 2003).

4. Institutional arrangements and stakeholders agenda setting for policy research

4.1 Current Institutional Arrangement

In Tanzania institutional arrangement are governed by the main principle of having greater control by farmers and clients, in cooperation with the public sector agencies and, increasingly, with the private sector agricultural service providers, Non-Governmental Organizations (NGOs) and civil society organizations. The institutional arrangement in the agricultural sector are organized under three levels; the Local level, the Regional level and the National levels (Shemdoe, 2013; Eaton et al., 2008).

4.1.1 The Local Level

Local level governance includes district, ward and village. They implement their activities under the leadership of the District Executive Directors (DEDs) in accordance with the existing local government financial and other regulations and rules. Day-to-day management, facilitation and backstopping of activities related to agriculture and livestock are the responsibility of the District Agricultural and Livestock Development Officer (DALDO) as a senior person with subject matter specialists located at the district headquarters and the District headquarter with Ward and Village Extension Officers (VEOs) as the frontline extension staff (JICA, 2008). Tanzania has been striving to increase the number of extension officers however, there is roughly one VEO post per village, vacancy rates are high, and the actual ratio is closer to one VEO per two villages, Village Extension Officers (VEO,s) are based at ward or village level depending on district circumstances. They play key roles in training, facilitating and supporting farmer group formation, farmer networking and assisting groups and farmers' fora/networks to develop service contract proposals and plans. They collaborate with research in conducting on farm trials. They also link with the district in ensuring the availability of current extension materials for their villages. At this level, Farmers' involvement in decisions concerning agricultural activities primarily come about through two processes which are:

(i) With increased empowerment, particularly through the gradual formation/evolution of Ward and District Farmer Fora (WFF and DFF). It is envisaged that, over time, ward and district fora will also determine the service Government Programme Document needs of their members, jointly plan annual activities for service delivery. The will also participate in the selection of service providers, their contracting and in quality control of service delivery;

(ii) Agricultural investments: all investment at the local level are built on the principle of planning starting at the village level, then being consolidated at the ward and finally at the district level. The programme's efforts at strengthening this mechanism are expected to gradually lead to a situation where the farmers' and local communities' own priorities effectively, guide the investment contents of the plans and determine the use of the funds.

The reporting mechanism follows the existing government structure whereby at the local level, where by five to six villages are grouped into wards, and 2-3 wards into divisions, which report to the district. The Local Government Authorities (LGAs) submit report through Regional Secretariats which forward the reports to the national level. Then MAFC have the overall responsibility of consolidating all the reports, and presenting a consolidated report to the agricultural activities basket fund steering committee.

4.1.2 Regional Level

Regional Secretariats assist LGAs on matters related to agricultural activities including: assisting councils in the preparation of and quarterly and annual reports; evaluating LGA quarterly reports, collating LGA plans and quarterly reports; undertaking regular monitoring visits to review quality of supported investments and services; and advising LGA on required improvements.

4.1.3 National Level

The national level governance is under the Agriculture and livestock sector lead Ministries. The responsibility of the ministries includes: (i) formulating and reviewing sectoral policies and monitoring performance; (ii) providing and supervising the implementation of regulatory services for crop and livestock development, marketing and farmers' organizations; (iii) contributing to the development and promotion of improved and sustainable agricultural practices; (iv) monitoring the performance of both public and private sector agricultural support services; (v) promoting the private sector's role in primary production, processing, marketing and provision of agricultural services; and (vi) promoting farmers' organizations (URT, 2008).

4.2 Relationship within the institutional arrangement

Figure 12 displays the conceptual diagram illustrating the linkages and interfaces between the Central government, regional and local governments, and social actors to bring about improved participation of the stakeholders.

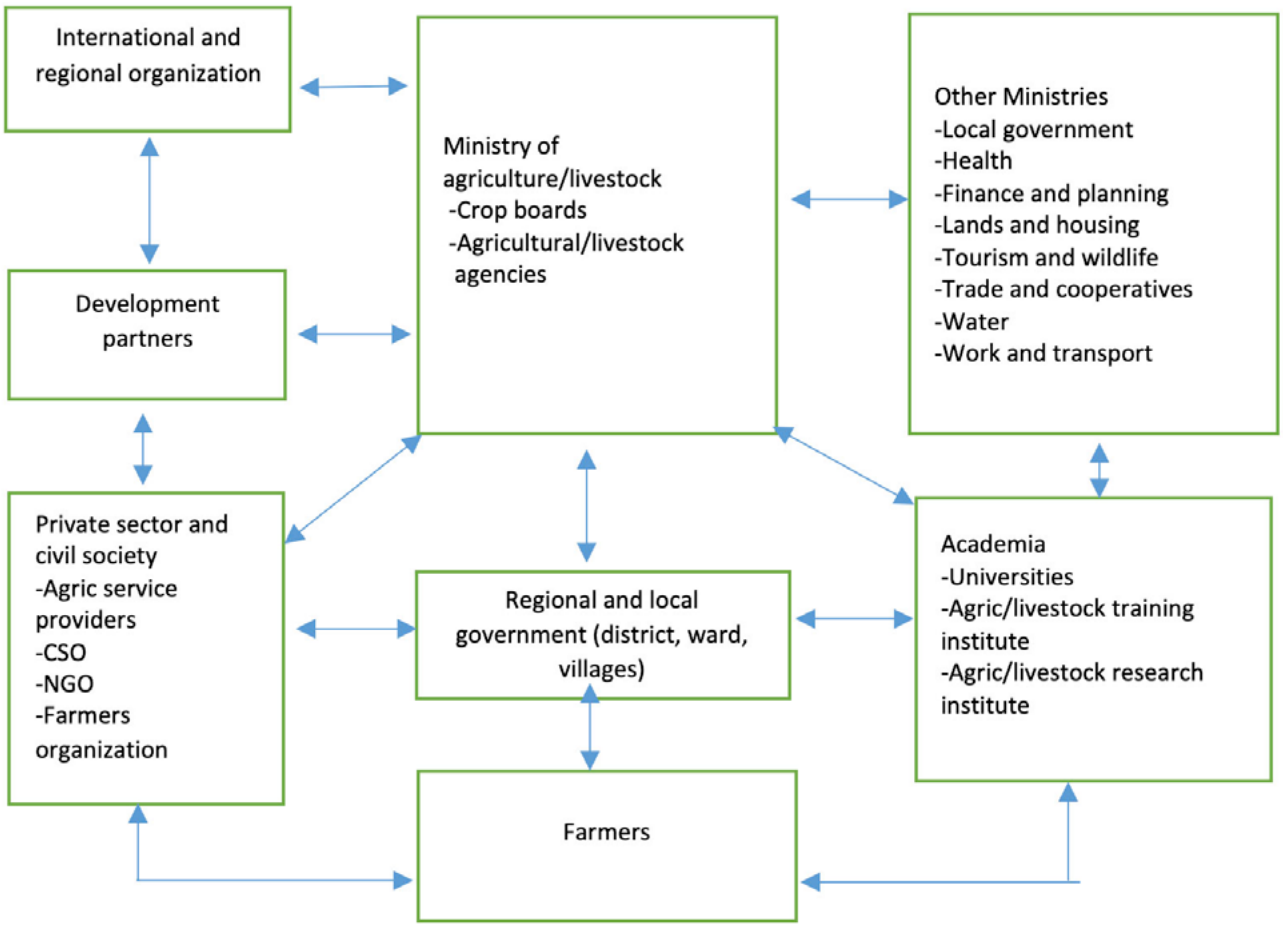

Figure 12: Institutional arrangement in the agricultural and livestock sector in Tanzania. Source: Modified from Mattee and Shem, 2007; Eaton et al., (2008)

The Ministries of Agriculture and livestock have semi-autonomous agencies that implement specialized and intensive technical and advisory aspects of its broad mandate under her line of supervision and boards that oversees the development of the crop/livestock subsector. The composition of the institutional arrangements is illustrated in Figure 13 and highlights the fact that there are different actors in the sector who play complementary roles along the agricultural and livestock value chain.

Government, through the ministries, is responsible for policy formulation, regulation and quality control; private sector and farmers engage in farm production, agro-processing and marketing of agricultural output;

- the civil society organizations (CSOs) complement Government in delivering of agricultural services to farmers.
- the academia and research institutions undertake research and disseminate information that may guide policy formulation, promotion of innovation, product development and technology advancement for commercialization of agriculture.
- financial institutions provide finance and credit to the farmers, cooperatives and agro-processors
- Development partners provide financial and technical assistance.

The example of crop boards include cashewnut board, sugar board, coffee board etc. farmers are involved in the decision making through their representative participation in the respective board and through representative of farmers organization. The same involvement of farmers in Non governmental organization and community based organization.

4.3. Opportunities for the Farmers to Participate in Policy Processes

The best and most common way by which farmers participate in policy formulation in Tanzania is through engagement with farmers' associations, community based organizations and Nongovernmental organizations (Matee, 2007). These organs have been working closely with farmers and are in a position to obtain reactions and opinions of farmers at the grassroots level on particular issues of concern related to policy. Farmers' associations, together with these organization voice the farmers' reactions/opinions through the media or through direct engagement with the relevant government sector. Examples of such national association/ organizations includes:

1. Tanzania Horticulture Association (TAHA): This is an apex private sector member based organization that advocates for the growth and competitiveness of the horticultural industry in Tanzania. Since its inception in 2004, TAHA has been an effective voicing platform for producers, traders, exporters and processors of the horticultural products mainly; flowers, fruits, vegetables, horticultural seeds, and spices. The Association safeguards the interest of the private sector and ensures the industry issues are well mainstreamed at the national and international agenda.
2. The Farmers Groups Network of Tanzania: It is also refered to as Mtandao wa Vikundi vya Wakulima Tanzania (MVIWATA) in Kiswahili. MVIWATA is a farmer's organization which unites small holder farmers in order to have a common voice in defending economic, social, cultural and political interests of smallholder farmers. Founded in 1993, MVIWATA aspires to empower smallholder economically and socially farmers through capacity building and undertaking lobbying and advocacy especially by strengthening their groups and networks, facilitating communication and learning so that they are capable of defending their interests.
3. Tanzania Livestock keeper's organization: The aim of this organization is to safeguard the interest of livestock keepers for efficient livestock production/management and increased incomes. The network provides support to communities to demand and defend their pasture rights where these are being threatened including in cases where private sector companies have attempted to take community land used for pasture and access to water.

4.4 Drivers of Policy in Tanzania

In principle, government policies are supposed to address issues that improve the welfare of the people, and for a country that is committed to eradicating pervasive poverty, policies are expected to be pro-poor. However, given that the country has embraced economic liberalisation; many policies have been formulated to facilitate economic liberalism in all its dimensions. The conceptual evolution of policies and their impact are explained in the next section.

5. The impact of policies, programs and strategies targeting local and regional variations in conditions for agriculture in Tanzania

5.1 Evolution of Public Policy Affecting Agriculture in Tanzania

Since independence, Tanzania has instituted a number of policies related to agricultural development. These reforms included market liberalization, removal of state monopolies, withdrawal of the government from production projects, and increased reliance on the private sector (IFPRI, 2000; Limbu, 1995; Potts, 2005). The overall objective of these policies which were set out in successive development plans, was to fight poverty and foster national development. In the agricultural sector, the main policy objectives centered on improving productivity to ensuring food security and food supply; raising food self-sufficiency and exploiting export potential; providing stable and sustainable income levels in agriculture (as many people are self-employed in the agricultural sector). The trend of Tanzania main policies have been classified into the following phases.

5.1.1 The period from independence to Arusha declaration (1961-1966)

During Tanzania independence in 1961, the primary sector of the Tanzanian economy was agriculture (crop production, hunting, forestry and fishing) accounted for 59% of current price GDP while mining, manufacturing and handicrafts, utilities and construction) was contributing only 10%, while manufacturing alone was responsible for less than 4% of GDP. The agricultural production exhibited a colonial economy which was characterized with reliance on export-oriented crop production (IFPRI, 2000). The production was based on plantations, settlers and large scale farming.

It was well acknowledged that the overall performance of the Tanzanian economy would depend mainly on the output results in the agricultural sector. Therefore a good growth of the agricultural sector was important to feed the growing population and export the surplus to bolster the economy. Therefore between 1961 and 1966 Tanzania's economy operated primarily under free market conditions were the grain marketing was largely unregulated, and Asian traders played an important role in crop marketing, resulting in some social tension.

In an attempt to circumvent the Asian trading network, the government adopted the World Bank approach to transform the economy[2] (Nord et al., 2009). The transformation approach promoted modern, large-scale cash crop farms under the supervision of foreign agricultural experts. Under this approach,m the National Agricultural Products Board Act was formulated and implemented to manage maize, wheat, rice, cashew nuts, and oil seeds through market purchase; price regulation; and regulation of storage, transport, and processing (Putteman, 1995). The Primary cooperative societies supplied crops to regional cooperative unions which sold them to a national marketing board. After an unsuccessful attempt to set prices at several levels of the marketing chain, the marketing board began fixing in store prices that allowed producer prices to vary according with cooperative costs. This supply chain lead to illegal marketing leading to the growth of a parallel market (Limbu, 1995).

During this period, income inequality was widening as a result the government was not happy with the trend towards inequality which was associated with African capitalist farming. It was seen that the economic structure was still not meant to serve the interest of the people rather a capitalist system which served a small number of people and alienated the majority (Limbu, 1995). This is the time when the socialist ideas started to cement among the leadership. Following this development, the government decided to change its political and economic ideology in 1967. The basic argument in favour of this changes was the thinking about agricultural sector and rural development that was prominent since the 1961. There was belief that in order to be able to get rid of poverty one has to transform the agricultural sector and or the rural areas where the majority of the people earn their living (Coulson, 1982).

5.1.2 The period from the Arusha declaration to the structural adjustment reform (1967-1985)

In 1967, the government passed the first national economic declaration that led to establishing Tanzania's socialism mode of production. The Arusha Declaration was passed, named after the location of the conference (Arusha). The declaration was meant to ddress the deficiencies in Tanzania's economic development, but it explicitly endorsed socialism and a planned economy (World Bank, 2002). Ujamaa, a Kiswahili word meaning family-hood and relationships, became the expression for Tanzania's socioeconomic system and a synonym for Tanzanian socialism.

The Arusha Declaration expressed the search for a balanced social policy, which the country had been pursuing for the first five years of independence (OECD, 2013). A new institutional framework for planned economic development was set where by the major means of production like banks, insurance and foreign companies were nationalized while the national companies, industries, and parastatal were established to manage the national economy.

In the agricultural sector, the move was associated with nationalization of the large means of production such as large businesses, plantations, estates, importer/exporters, and food processors (Lokina et al., 2011). In rural areas, the new policy encouraged the formation of vijiji vya ujamaa in Kiswahili, or socialist villagization program as a step to realizing a socialist and self-reliant economy. The emphasis was to encourage stallholder farmers to live in groups and share basic services in order to make it easier for the government to reach them easily and improve their living standards and therefore the government could easily improve economic infrastructure such as transport systems, water, energy supply, and health and education facilities. Further, enterprises were created from nationalized agricultural processing firms and large-scale estates (e.g. sisal). The number of parastatal organization increased from about 40 in the 1960s to more than 400 in the early 1980s (Amani, et al., 2003).

Despite all these planned reforms, the literature and data demonstrate that the economy and the agricultural sector performed poorly during 1970s and during the first half of 1980. The reason for this downfall was the attempt by the state to monopolize crop marketing, lower producer prices linked to desires to tax agriculture to support industrialization to parastatal marketing inefficiency and (in the case of export crops) to grossly overvalued exchange rate and neglect of transportation infrastructure (Limbu, 1995). Johnson (1989) argues that the poor performance in the agricultural development was due to unstable agricultural policies formulated based on adhoc decision that arise

[2] but it lacked the necessary financial support because of the sudden withdrawal of foreign aid by the former German Democratic Republic and the United Kingdom (Wenzel and Wiedemann 1989)

from shock caused either by unfavourable weather conditions or by manmade calamities.

For instance in 1972, the government formed an nitiative, which was referred to siasa ni Kilimo in Kiswahili or Politics is Agriculture which aimed at improving the performance of the agricultural production. However, before this policy was adequately implemented the country was hit by severe drought 1973/1974 that also hit other African countries (Banda, 1997). In response to this drought, the government launched another strategy the so called 'Kilimo cha kufa na kupona' in kiswhili or Produce or Perish campaign.

To prevent a recurrence of such as stressful situation in the future, the government established Crop Performance Surveillance System (CPSS) and Strategic Grain Reserve (SGR) in 1976 for the purpose of maintaining food security (Cooksey, 2003).However this campaign could not bear fruit because it was almost during the same period that the government embarked on the ambitious villagization programme and the world was hit by the oil crisis. The following year (1977), the East African community collapsed[3]. Worse enough in 1978/79 Tanzania went to war with Uganda's Iddi Amin whereby much resources had to be mobilized away from agricultural production. Another oil crisis hit the world in 1979 which combined with the drought of 1978/1979 which brought about more economic difficulties (Cooksey, 2003). In due course, the government announced eighteen months of hardship to revamp its economy but the set period took longer than expected.

The country entered the beginning of 1980s under enormous economic difficulties. There was a deep economic crisis in which major macroeconomic variables were out of balance. Inflation was high, at around 30 per cent and the budget was in deficit (Msambichaka et al.,1995). Balance of payments was in deficit, Shortages of goods were widespread and the productive capacities were underutilized following shortages of foreign exchange to finance imported inputs. This was the time where the backbone of the economy (agricultural sector) was almost collapsing. As a result, the performance of socialism and self-reliance was seen devastating. There was an economic stagnation that thoughtful to force the government to enter into economic reforms. As a last resort, the government started formulating a national agricultural policy, an assignment which was completed in 1983 (Putteman, 1995). The objectives of the policy were mainly four namely:

- To provide enough food for growing population
- To generate foreign exchange
- To supply domestic industries with raw materials
- To raise rural income levels and alleviate poverty.

5.1.3 Economic liberization and reforms period (1986-1995)

In response to the economic crisis of the early 1980s, Tanzania had no alternative except to accept to reform the economy after a long period of resisting calls form the international community particularly IMF and the World Bank. The reform was a new development model that became popularly known as the Structural Adjustment Programmes (SAPs) (Maliyamkono and Bagachwa, 1990). SAPs stressed the efficiencies of the free-market allocation of resources and emphasized deregulation and export orientation so as to achieve international competitiveness based on the comparative advantages. The model thus supported the notion of globalisation or one world in which a single market for goods, capital, services, skills and technology prevails. As a result in 1986, the government adopted the three-year Economic Recovery Program (ERP) that addressed SAP with support from the International Monetary Fund (IMF), World Bank, and other international donors.

This reform was followed by the second Economic Recovery Program (ERP II), also called the Economic and Social Action Plan (ESAP), implemented over 1989-1992. The main elements of these programs were reduction in the fiscal deficit, a series of large devaluations, import liberalization, positive real interest rates, and the elimination of most consumer price controls (Msambichaka et al., 1995). Under the EPRII, Tanzania adopted stabilization measures,

[3] The East African Community of 1967-77 aimed at a common market, a common customs tariff and a range of public services so as to achieve balanced economic growth within the region. Causes for the collapse were seen as "lack of strong political will, lack of strong participation from the private sector and the civil society in the cooperation activities, the continued disproportionate sharing of benefits of the Community among the Partner States due to their differences in their levels of development and lack of adequate policies to address this situation.

macroeconomic policy reforms and reforms in trade and the exchange rate regime. The outcome of these reforms is that access to additional external support was enhanced and the decline of the economy was halted with output growth recovering to about four per cent per annum (Potts, 2008).

This structural changes made Tanzania to move from a marketing system controlled by crop authorities and cooperatives to a liberalized market in which traders and cooperatives compete to provide marketing services. Movement controls were relaxed in 1984 and abolished in 1987 (OECD, 2013). Private traders were first allowed to buy from cooperatives and later allowed to purchase food crops from farmers. Fixed pan-territorial prices were abandoned, replaced by floor prices, references prices, and finally market prices. In the first half of the 1990s, Tanzanian liberalized input distribution and export marketing (Ngowi, 2009). Fertilizer subsidies were removed in phases from 1991 to 1995, as private traders were allowed to import and distribute fertilizer. Private traders began to purchase export crops, eventually replacing the marketing boards (Nord et al., 2009).

In the agricultural sector, domestic food markets were liberalized, private trade in food crops was deregulated, and movement controls were abolished in 1987. The National Milling Corporation (NMC) was given more autonomy in management, but was forced to scale back its operations and cover its costs. For example, the Strategic Grain Reserve (SGR) which began operations in 1978 in response to the 1973-74 drought, was transferred from the NMC to the newly created Food Security Department in the Ministry of Agriculture (Amani and Maro 1992). Since its formation in the 1967, the Tanzania Fertilizer Company (TFC) has maintained a monopoly on fertilizer imports, but during this period the private traders were technically allowed to import and distribute fertilizer.

In addition, more changes that appeared in the agriculture sector include, the government allowing private sector to engage in seed supply (Mfungahema, 1999). Also liberalization of traditional exports began in 1993 with the changes in the Coffee, Cotton, Tobacco, and Cashew Acts allowing private traders to buy, process, and export these crops.

The idea was for the government to disengage from direct production and marketing in order to focus on essential public services such as research, extension, sanitary regulations, and quality control. The crop authorities have been restructured as crop boards, responsible for regulation, research, and information services (Bitegeko, 1999).

5.1.4 The period from 1995

From 1995, with the new government regime, major reforms were made to liberalize the market. It became apparent that the adjustment and stabilization measures had resulted in erosion in the previous gains in social development in the country. As a result, Tanzania started to address poverty as a major policy concern. These initiatives coincided with the World Bank's introduction of the Comprehensive Development Framework, which essentially recognized that development had to be pursued in a comprehensive manner, taking into account economic as well as social and political processes (Maliyamkono and Bagachwa, 1990; Arkardie, 2005). It is in this context that the international financial institutions (IFIs) came up with the concept of Poverty Reduction Strategy Papers (PRSP) tied to Highly Indebted Poor Countries (HIPC) debt relief funds. The Tanzania government responded quickly to the demand to prepare a PRSP in order to gain access to the HIPC debt relief resources (Wangwe and Charle, 2005).

The Presidential Parastatal Sector Reform Programme was formed followed by a Privatization Master Plan. The government undertook civil service and parastatal reform, privatizing state monopolies and resulted in the divestiture of 336 public enterprises by 2010 (NAO, 2011).

The National Poverty Reduction Strategy, was adopted in 2005. In 2010 it was reviewed and the current second version, MKUKUTA II, was implemented between 2010/11 and 2014/15 (URT, 2016c). MKUKUTA II, provides an operational framework for achieving the MDGs and Tanzania's Development Vision 2025 which aims to transform Tanzania into a middle-income country. Since then, there has been complemented by the National Five Year Development Plan I (FYDP 2011/12 – 2015/16), and Plan II (2016-2021 which attempt to address MKUKUTA implementation challenges. These reforms went hand in hand with the reform in the agricultural sectors.

5.1.5 Major agricultural policies and programmes developed during this period.

5.1.5.1 Agricultural policies

The main policies implemented are listed and summarized in Appendix 2.

5.1.5.2 Agricultural strategies and programmes.

Agricultural Sector Development Strategy (ASDP)

From 1995, the government identified agriculture as one of the priority sectors and envisions it as a modernized, commercial, highly productive and profitable sector relying on the active involvement of the private sector (URT, 2011a). In 2006/07, the Government launched the first nationwide Agricultural Sector Development Programme (ASDP I) after a deep and broad based consultative process which resulted in the production of Rural Development Strategy (2002), Agricultural Sector Development Strategy (2001), and finally the ASDP (2006) (MAFSC, 2011). The Agricultural Sector Development Strategy (ASDS), adopted in 2005 and implemented through the Agricultural Sector Development Programme (ASDP), provides the framework for agricultural policy.

This programme was built under five main components which were: strengthening of the institutional framework, reforms in agricultural research and extension services, facilitation of investment, development of markets, irrigation and water management, rural infrastructure and fiscal reforms. The vision of the ASDS is to have in place by 2025, an agricultural sector that is modernized, commercial, and highly productive and which utilizes natural resources in a sustainable manner (MAFAP, 2013).

Ware House Receipt System (WHRS)

After the collapse of the state-managed cooperatives and Tanzania's banking sector in the late 1980s, farmers did not have sufficient access to markets and financial services. In the 1990s, during the liberalization/ privatization period of the financial sector and agricultural markets, the private sector did not respond as anticipated, especially in rural areas. This prompted the government of Tanzania and IFAD to launch the Agricultural Marketing Systems Development Programme (AMSDP) (MAFAP, 2013). A particularly outstanding element of this programme was the piloting of the Rural Inventory Credit Scheme through the Warehouse Receipt System for cereals (maize and paddy).

Currently, the WHRS model has been replicated by other producers as well as private entrepreneurs, and some schemes initiated revolving funds to reduce dependence on banks. To this end, AMSDP and RFSP have been scaled up in a new joint programme – the Marketing Infrastructure, Value Addition and Rural Finance Support Programme (MIVARF), which covers all regions of Tanzania Mainland and Zanzibar. MIVARF has a special WRS sub-component that incorporates partnership with the private sector.

However, the introduction of the WRS in Tanzania in 2005 was sought to provide a viable solution to marketing problems such as quality, price stability, bargaining power, tax collection and bulky yields, but there has been a number of challenges demoralizing farmers. Among them was the provision of price lower than the market price of farmers produce and delayed payments. This calls for a feasible mechanism to address the problem if the system is to attract the majority of farmers and attain the intended outcome in the country.

Also, ignorance of how the system works[4] is another challenge facing the WRS in which most farmers and stakeholders in general are still unfamiliar with how the WRS works, a situation stakeholders said needed urgent intervention by conducting public awareness to make it known (URT,2008). Lack of suitable storage infrastructure, a legal and regulatory framework, requisite skills and weak supervisory institutions, create a difficult environment in attracting key stakeholders especially banks.

5.1.5.3 Recent Initiatives

Kilimo Kwanza (Agriculture First)

The government has identified agriculture as one of the priority sectors and envisions it as a modernized, commercial, highly productive and profitable sector relying on the active involvement of the private sector. The Agricultural Sector Development Strategy (ASDS), adopted in 2005 and implemented through the Agricultural Sector Development Programme (ASDP), provides the framework for agricultural policy.

As a result, in 2009 the policy knonw as "Agriculture First" (Kilimo Kwanza) policy was launched in 2009 with the objective of fostering a green revolution and transforming agriculture into a modern sector (OECD, 2013). Implementation of Kilimo Kwanza (meaning Transforming Agriculture) entails modernization of agriculture and entails mobilization of the active participation of all Tanzanians, the Development Partners and Private sectors to enhance the agricultural economy: increase crop production, improve livestock husbandry and undertaking fish farming. In crop

[4] There were basically five main players in the AMSDP WRS model: farmers (depositors), SACCOS, collateral managers, commercial banks and insurers. The basic concept is that: Farmers deposit produce in a designated warehouse under the supervision of a collateral manager and obtain a receipt; a copy of the receipt is sent to the SACCOS. The farmers do not lose identity of their deposited produce and they remain responsible for identifying buyers and selling. (IFAD, 2012).

production the aim is to: increase the acreage under cultivation by using modern farm implements such as tractors and power tillers, improving knowledge and increasing acreage under irrigation, using improved seeds and fertilizer, control of pests and investing in large scale farming. In animal husbandry the aim is to increase production of meat, milk and poultry products. In the fisheries sector the aim is to increase fish farming, improve fish yields and fish catch and at the same time improve environmental management.

The Southern Agricultural Growth Corridor of Tanzania (SAGCOT)
Another major initiative to enhance investment in agriculture is the Southern Agricultural Growth Corridor of Tanzania (SAGCOT). It is an agricultural partnership designed to improve agricultural productivity, food security and livelihoods in Tanzania. SAGCOT was established in 2011 and its main objective is to foster inclusive, commercially successful agribusinesses that will benefit the region's small-scale farmers, and in so doing, improve food security, reduce rural poverty and ensure environmental sustainability. The risk-sharing model of a public-private partnership (PPP) approach has been demonstrated to be successful in

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Tanzania Agriculture and Food Security Investment Plan (TAFSIP)
Finally, the Tanzania Agriculture and Food Security Investment Plan (TAFSIP) that was launched in 2011. TAFSIP is designed to address the core national problems of poverty and food insecurity in rural areas and promote agricultural growth as well as food and nutrition security in Tanzania under the framework of the Comprehensive Africa Agriculture Development Program (CAADP) (URT, 2011a).

TAFSIP coordinates the resources needed to accelerate implementation of existing and new development initiatives in agriculture and food security. It is aligned with Tanzania's social and economic development aspirations expressed in Vision 2025 (for the Mainland) and Vision 2020 (for Zanzibar), which seek (TDV, 2025, pg 5) "to have an economy that has been transformed from a low productivity agricultural economy to a semi-industrialized one led by modernized and highly productive agricultural activities which are effectively integrated and buttressed by supportive industrial and service activities in the rural and urban areas."

TAFSIP will be the financing mechanism and framework for the implementation of the Agricultural Sector Development Strategy (ASDS) for mainland Tanzania and the Agricultural Strategic Plan (ASP) for Zanzibar. The Goal of TAFSIP is to contribute to the national economic growth, household income and food security in alignment with national and sectoral development aspirations. This 10 year sector-wide plan aims to (pg.59) "rationalize allocation of resources to achieve annual 6% agricultural GDP growth, consistent with national objectives to reduce rural poverty and improve household food and nutrition security" and CAADP objectives. It will result in the Government of Tanzania allocating a minimum 10% of its budget to the agricultural sector.

The primary beneficiary is the smallholder farmer, pastoral and agro-pastoralists and fishing households adopting improved agricultural practices that increase food production and cash income. Other beneficiaries include agro-processors, transporters, traders and service providers. Future generations of Tanzanians will benefit from measures to prevent environmental degradation and sustainably manage natural resources and the number of beneficiaries of social protection programmes is expected to decline as other TAFSIP initiatives bear fruits.

Accelerated agricultural and rural development will contribute significantly to Tanzania's national development aspirations. The principal benefits of the programme will be: (i) increased and sustainable food production and non-food agricultural commodities improving the nutritional status of households, boosting national food security, and providing raw materials for the agro-industrial sector; (ii) reduction in the prevalence of under-nutrition and malnutrition

[5] The Southern Agricultural Growth Corridor covers approximately one-third of mainland Tanzania. It extends north and south of the central rail, road and power 'backbone' that runs from Dar es Salaam to the northern areas of Zambia and Malawi.

in rural communities and protection from the impact of natural disasters; (iii) accelerated commercialization of the rural sector generating increased cash incomes from farm and non-farm enterprises; (iv) protection and enhancement of the long-term productive capacity of Tanzania's natural resource base through more sustainable land and water management practices and measures to adapt to climate change; and (v) improved institutional capacity to mobilize and manage resources in support of agricultural sector development (URT, 2011c; MAFAP, 2013).

All these policies, programme and strategies were meant to boost the agricultural sector in order to improve the wellbeing of the people as majority of the population are employed in this sector. The impact of these policies and programmes to the economy and society as whole is explained in the next section.

5.2 Economic Impact of Successive Agricultural Policy Reforms

5.2.1 Impact on economic growth

In general, Tanzania has experienced sustained growth acceleration over the period (Fig 14).Tanzania's growth take-off was spurred by several key factors, including the significant structural changes that occurred as the basic institutions of a market economy a private banking system, the unification of the exchange rate, price liberalization were introduced.

In addition, Tanzania's move to a higher growth trajectory came following a period of substantial economic reform. Three distinct phases in economic policy making can be identified (figure 2)2. The first, which began at the time of the Arusha Declaration in 1967, was the period of Ujamaa socialism, which created a one-party system with state control of the economy and nationalization of all major enterprises. This period ended in the mid-1980s, with attempts to gradually introduce key components of a market-oriented economy.

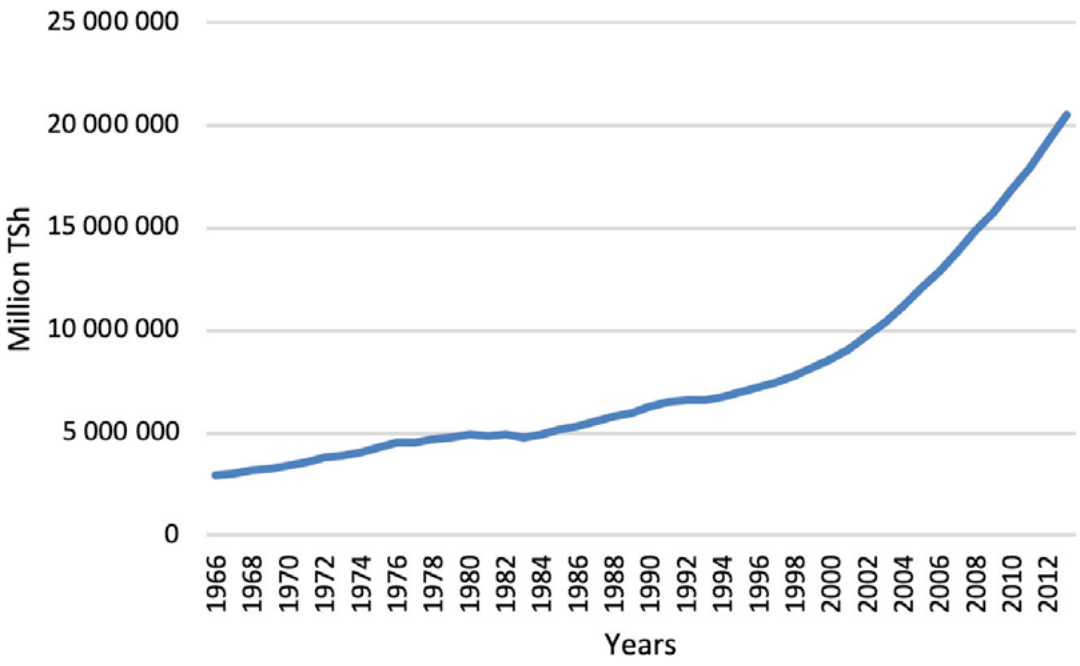

Figure 13: Annual GDP at constant 2010 USD. Source: World Bank (2017)

From 1995 onwards, the Tanzania GDP grew faster compared to the past this acceleration has been driven by domestic demand, not exports. Large increases in both consumption and investment have been recorded, in both cases reflecting significant increases in public spending.

The key sectors contributing to growth have been services and, to a lesser degree, industry. Agriculture has minor contribution to the growth. Comparing figure 14 and Figure 15, it can be judged that, the agricultural sector has a little contribution to the GDP growth in the recent years. Studies of the agricultural sector during this period show little or no improvement in yields for the sector as a whole, with increased output coming from an increase in land under cultivation.

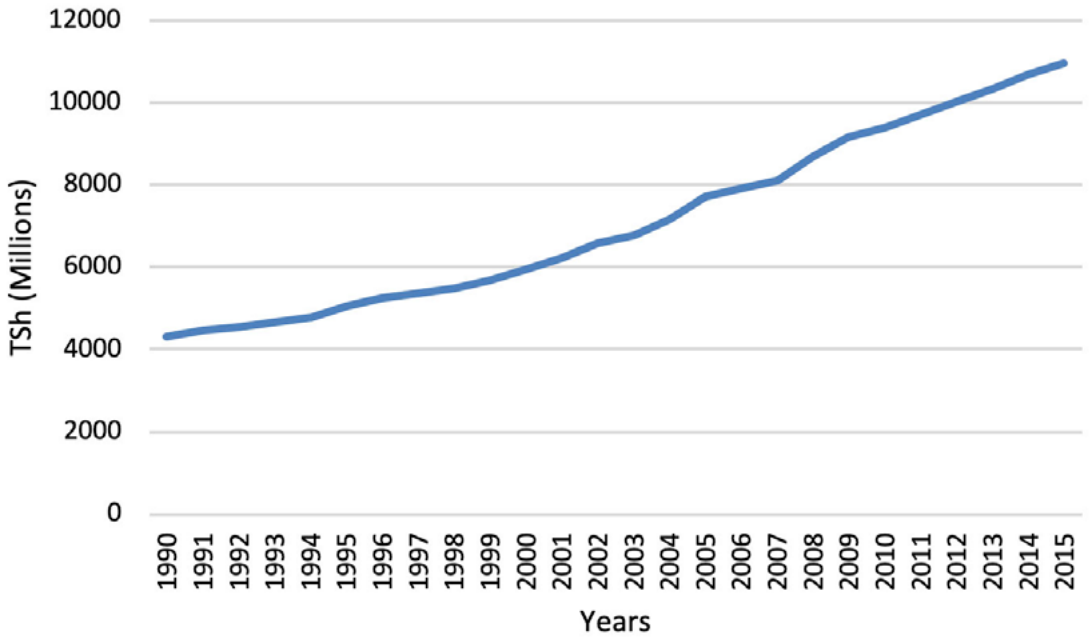

Figure 14: Agricultural Value added (at Constant 2010 USD). Source: World Bank (2017)

The limited contribution of agricultural sector in a country where about three-quarters of the population resides in rural areas, where poverty is concentrated, is of major concern. It also represents an opportunity, as international experience suggests that the sector can respond rapidly if the right incentives and supporting infrastructure are put in place.

The detailed analysis of this sector indicates that the contribution of agriculture to the national GDP has been declining over time. In 2000/01 for example, agriculture accounted for 31% of the GDP. But since then the contribution has dropped steadily to 23.4% in 2011 (NBS, 2014b). But on the contrary, the economy as a whole has been growing at an impressive rate of 5-6% per annum during the same period. This implies that the sources of economic growth have been other sectors; not agriculture.

As could be noted from Figure 1 in section 2.1, the service sector is the main contributor to the GDP and the contribution is increasing over years. In 2000/01 the service sector contributed 45.3% to GDP and has increased to almost 50% in 2011. The industry and construction sector is contributing less to GDP than agriculture, but unlike agriculture, the contribution has been increasing over years. In 2000/01 the industry and construction sector contributed 17.9% to GDP, but by 2011 its contribution increased to 21.7 percent. The fact the growth of the economy is not based on the sector that employs the majority of people, agriculture in this case, explains why economic growth is not being translated into improved wellbeing of the majority of people, especially those who derive livelihood from agriculture.

Tanzania's agricultural sector has shown a declining share in relative GDP contribution, from about 50% in 1990 to less than 25% in 2010 (Figure 16). Despite slow growth and a declining share in GDP contribution, agriculture remains important sector in the Tanzanian economy because it imployes majority of the population.

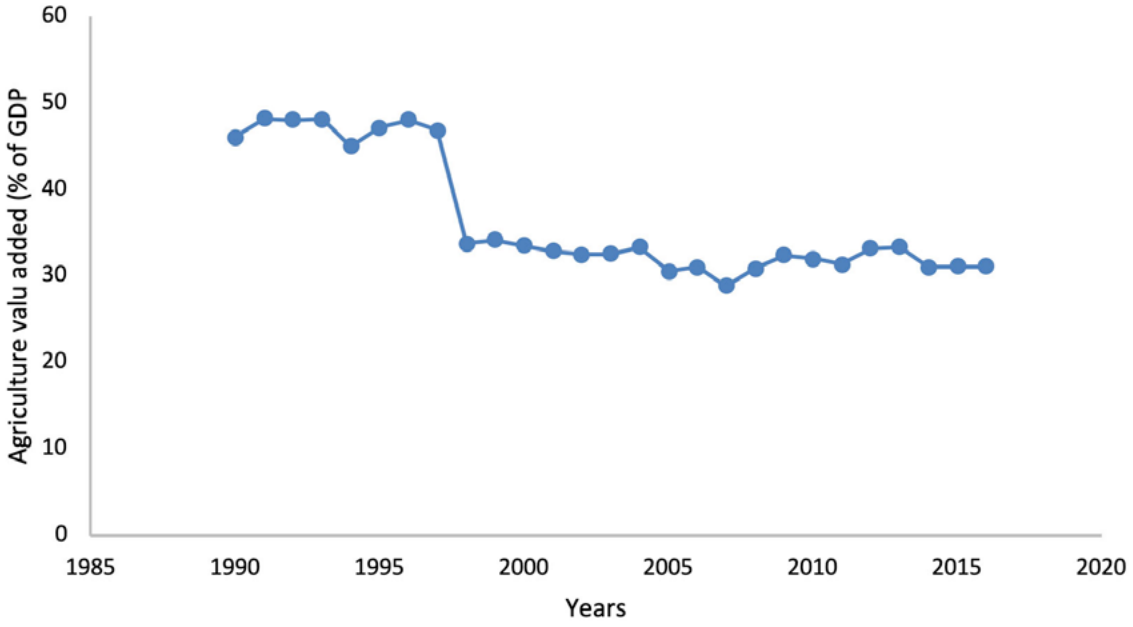

Figure 15: Agriculture Value added percentage share of GDP (at constant 2010 USD). Source: World Bank (2017).

From 1985 -2015, the share of agriculture to GDP was 26.3 percent in 2010 and decreased to 25.2 percent in 2011 and decreased further to 24.8 percent in 2012. The agriculture share to GDP has continued to decrease in 2013 and 2014 to 23.8 and 23.0 percent respectively (Figure 16).

Furthermore, many changes can be detected if we compare 2011 with 1961 (Table 3). Tanzania population was 10.4 million people in 1961 and in 2011 the population was estimated to be 46 million people meaning that the population has increased by a factor of 4.5 for the cropping areas, cereals grew at the same speed, with pulses far more so (by a factor 5.5), and roots and tubers by a factor 2.7, i.e. at only 60% of the level of total population growth.

A production increase can be partitioned into two components as follows: the contribution of area is taken as the increase in area since 1961 multiplied by the yield in 1961 and the contribution of yield as the area in 1961 multiplied by the increase in yield since 1961. The percentage contribution is then obtained by expressing each component as a percentage of their sum. Thus, for the basic food crops taken together, 96% of the total growth of production can be attributed to area expansion in the past 50 years and only 4% to yield improvements. Tanzania's total area of basic food crops expanded from 2.3 million ha to 9.2 million ha between 1961 and 2011, an increase by a factor of 4 which is almost as high as the population increase in this same fifty-year period. Figure 4 compares population growth with staple food production growth. Table 3 gives more detailed food crop statistics, comparing 2011 with 1961.

Table 2: Trend on areas under cultivation

	1961	**1970**	**1980**	**1990**	**2000**	**2011**
Population (millions)	10.4	13.6	18.7	25.5	34	46.2
Crops (x m. ha of harvested crops)						
Cereals	1.3	1.7	2.9	2.6	2.5	5.7
Pulses	0.3	0.4	0.7	0.9	1.2	1.6
Roots/tubers1	0.6	0.8	0.7	1	1.3	1.6
Plantains	0.1	0.2	0.2	0.3	0.2	0.3
Total	2.3	3.2	4.5	4.7	5.2	9.2

Source: André et al., 2013

The trend on areas under production is increasing over the years. However over this period, the country experienced many ups and downs. At independence in 1962, Tanzania could not feed her population on the basis of its own basic food production at the level of WHO food requirements. During the 1960s, the situation deteriorated (to 78-83% of minimum requirements), but the country saw a big improvement in the 1970s, partly due to initiatives aimed at improving the performance of the agriculture sector in the country that were implemented during this period. the initiatives includes 'Politics is Agriculture' in 1972 which 'Life and death effort food production campaign productions to improve agriculture' (Kilimo cha kufa na kupona) in 1974 which which enebled the theo cunrty to recover after the 1973/1974 with subsequent production increasing.

Average yields in the 1960s for both cereals and roots and tubers decreased (for cereals to a very low 600 kg/ha), although the area under crop cultivation expanded somewhat. In the heady years of the Ujamaa Revolution in the 1970s, the cropping area for cereals and pulses increased significantly, as did yield levels (see Table 1). In 1980 Tanzania could easily feed its rapidly expanding population on the basis of its own basic food production at a level that was 25-33% above minimum WHO requirements. Cereals had become more important than roots and tubers in the composition of the potential basic food basket.

In the 1980s, the area and yield levels for roots and tubers (mainly cassava and sweet potatoes) further increased and yield levels for cereals reached an all-time high (1500 kg/ha), although the area under cultivation decreased somewhat. As a result, the Tanzanian population, despite its on-going very high population growth, could potentially easily be fed with food grown in Tanzania itself.

However, the 1990s saw a dramatic decrease in the country's registered basic food production situation to levels that were below the low 1961 levels and 7-13% below minimum WHO requirements. The last ten years showed a remarkable recovery. Farmers more than doubled the area under cereals, while also the area under pulses and roots and tubers has increased. In a decade, the total area growing basic food crops increased from 5 million ha to 9.2 million ha.

As a result of an expansion of farmers' activities, the food production situation improved to close to 100% of WHO requirements in 2011. The food basket in 2011 had further shifted away from roots and tubers and was 67% cereals, 12% pulses, 2% plantains and 19% roots and tubers (Table 3). This might be a result of the Agricultural Sector Development Programme, which the Tanzanian government adopted, together with some major donors.

Table 3: Trend in yield per acre

	1961	1970	1980	1990	2000	2011
Yield (1000 kg/ha)						
Cereals	0.8	0.6	1	1.5	1.4	1.4
Pulses	0.4	0.4	0.5	0.6	0.7	0.9
Roots/tubers	5	4.9	8.1	8.9	4.8	6
Plantains	2.6	2.6	2.6	2.6	2.3	2.6
Total basic food production (million tons)						
Cereals	1	1	3	4	3.6	7.9
Pulses	0.1	0.2	0.3	0.5	0.9	1.4
Roots/tubers	3	3.7	5.6	8.6	6.2	9.8
Plantains	0.3	0.5	0.6	0.7	0.6	0.7

Source: André et al., 2013

5.2.2 Specific crops production performance

Production of maize is higher than any other cereal in the country. However, although the above average production figures show significant increase, annual production has been fluctuating in accordance with the effects of weather and other technical factors. Maize production has grown an annual rate of 2.4 percent over 1985-1998, somewhat less

than the population growth rate of 2.8 percent. On the one hand, it is a matter of concern that maize production has fallen (slightly) in per capita terms since 1985.

In general, food crop production grew rapidly in the late 1980s, before slowing to the rate of population growth in the 1990s (Figure 16).During the late 1980s, staple food crops grew 4.3 percent annually while other food crops grew at 3.0 percent. Since 1990, the annual growth rates have fallen to 3.0 and 2.8 percent, respectively. One interpretation is that food crop production responded to the liberalization of domestic food and rice.

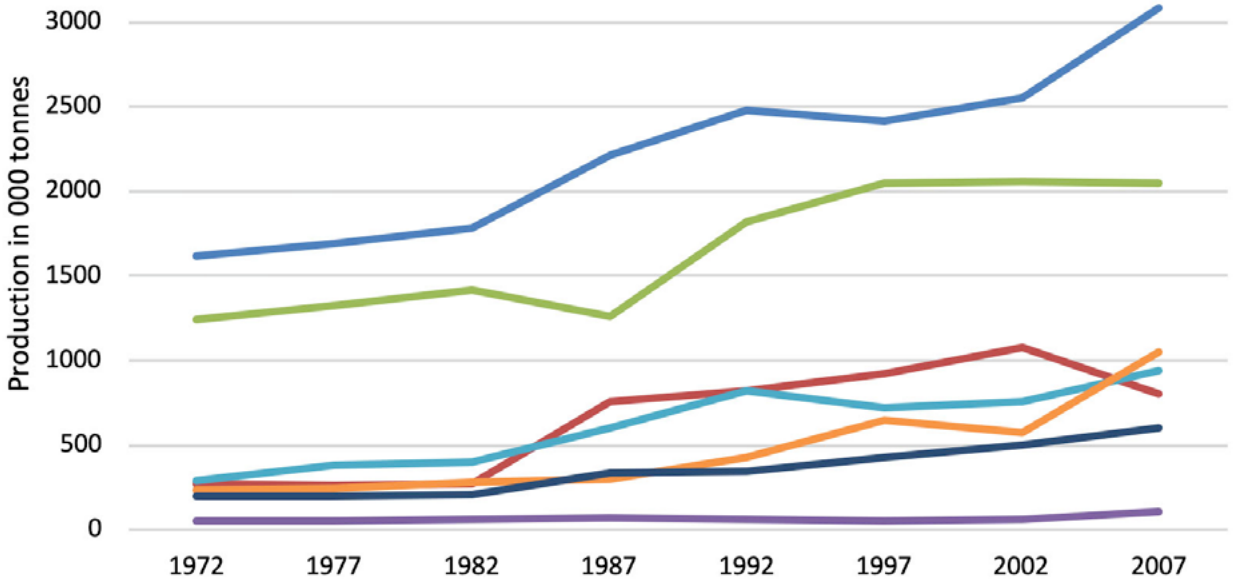

Figure 16: Trend in food production from 1972-2007. Note: Units are expressed as 5 year cumulative averages. Source: (NBS, 2013)

The main production constraint is lack of proper water management. Unreliable water availability on smallholder farms makes rice production very risky and reduces profitability of using fertilizers, herbicides, insecticides and improved varieties. Most farmers are unable to cover production costs.

5.2.3 Impact on Production of Export Crops

Analysis of export crops performance shows considerable variation in the study coverage period. During the early 1970's and mid 1980's, these crops displayed an upward trend with coffee leading the overall contribution to the crops subsector. Variations in production were recorded during the period from mid 1980's to about mid 1990's with indications of downward trend mostly caused by world market prices and a change in the climatic conditions (Figure 17).

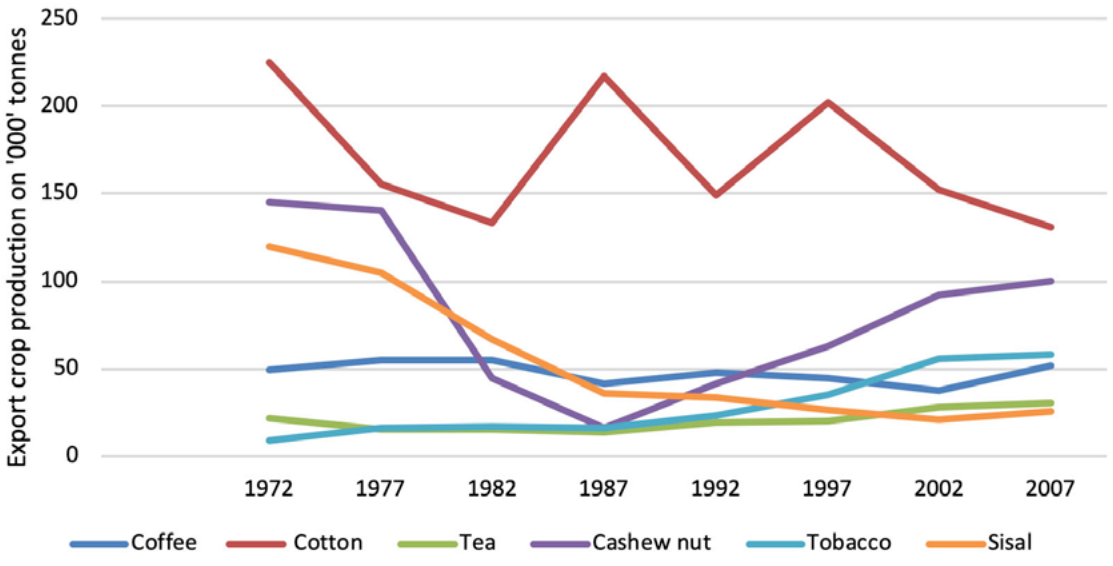

Figure 17: Trend in Cash crop production from 1972-2007. Note: Units are expressed as 5 year cumulative averages.. Source: NBS, (2013).

Cotton ranks second after coffee as a major export crop in Tanzania The crop is grown in areas South of Lake Victoria and includes, Mwanza, Shinyanga, Mara, Tabora, Kigoma, Kagera and Singida regions (Mdoe and Mlay, 2015). According to available data, production levels have been fluctuating, recording on all time high production of 376,591,000 kilogramme for 2005/06 season and the lowest production of 92,579,000 kilogramme in mid 1980's. Export crop production expanded just 1.8 percent per year over the late 1980s. In contrast, the growth rate in the 1990s has been 7.7 percent per year. Strong growth in cashew nuts and tobacco have offset declines in coffee.

5.2.4 Impact on application of modern agricultural technology

The average food crop productivity in Tanzania stood at about 1.7 tons/ha far below the potential productivity of about 3.5 to 4 ton/ha (Figure 18). High dependence on rainfall is the main characteristics of the agricultural practices by the small holder farmers in the country. In addition, the crop cultivation is characterized by low mechanization where majority farmers are using poor farm inputs such as hand hoe and traditional seeds. The soils have been degraded with significant loss of nutrients and thus contributing to low productivity problem. The use of fertilizer in the country is far below other countries in Africa with similar conditions. It is estimated that only 12% of farmers use mineral fertilizers (AFAP, 2012). The low use of fertilizer in Africa can be explained by demand side as well as supply-side factors (Tiberti, 2015).

However, government efforts are underway to revamp agricultural productivity such efforts include the introduction of the fertilizer subsidy scheme famous known as fertilizer voucher system. The current fertilizer subsidy program was introduced in 2008 under the national agriculture input voucher scheme (NAIVS).this programme is intended to facilitate fertilizer use in targeted, high-potential areas, boost the return to fertilizer use and ultimately increase food production. Following the introduction of this scheme, total fertilizer consumption in Tanzania increased. In year 2010, the fertilizer purchased and distributed by private sector for the NAIVS program was 151,000 MT or 57% of the market.

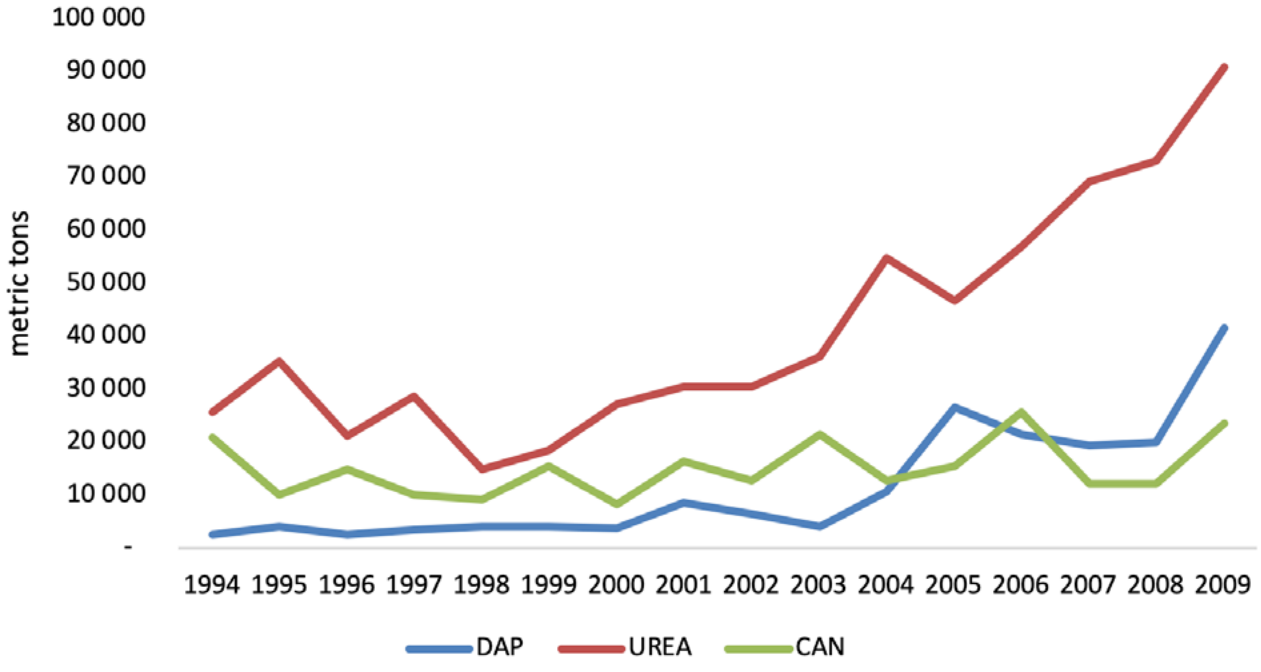

Figure 18: Quantity of mineral fertilizer use in Tanzania. Source: FAOSTAT, 2017.
Legend: DAP = Di Ammonium Phosphate; CAN=Calcium Ammonium Nitrate

5.2.5 Impact on Livestock development

Tanzania has also experienced an increase in livestock figures, especially during the last two decades (Table 4). Except for pigs and chickens, the 1961-2011 growth figures of the several livestock species were (sometimes considerably) lower than the growth of the Tanzanian population.

Table 4: Tanzania's livestock (x millions), 1961-2011

Year	1961	1970	1980	1990	2000	2011
Cattle	8.1	10.1	12.6	13.0	16.7	21.3
Sheep	3.0	2.8	3.8	3.6	3.5	6.4
Goats	4.5	4.4	5.7	8.5	11.9	15.2
Pigs	0.1	0.1	0.2	0.3	0.5	0.5
Total	15.6	17.5	22.2	25.4	32.6	43.4
Chickens	7.0	10.8	17.0	20.5	27.8	34.0

Source: URT (2014)

The contribution of various policy reforms in the livestock sub sector to national GDP has been very minimal. For example, despite the large stock of livestock in the country, the export of livestock has been very low at 0.01 per cent of the live animals over the last seven years (Figure 19). The low growth decrease in the livestock sector could be due to decrease in the population amongst livestock traded, traditional livestock husbandry which pays main attention to quantity rather than quality and hence reduce the number of cattle sold, low diversification of animals and low investment in the sector in term of value-addition. 5.3 Learnings from Agricultural Policy Reforms in Tanzania

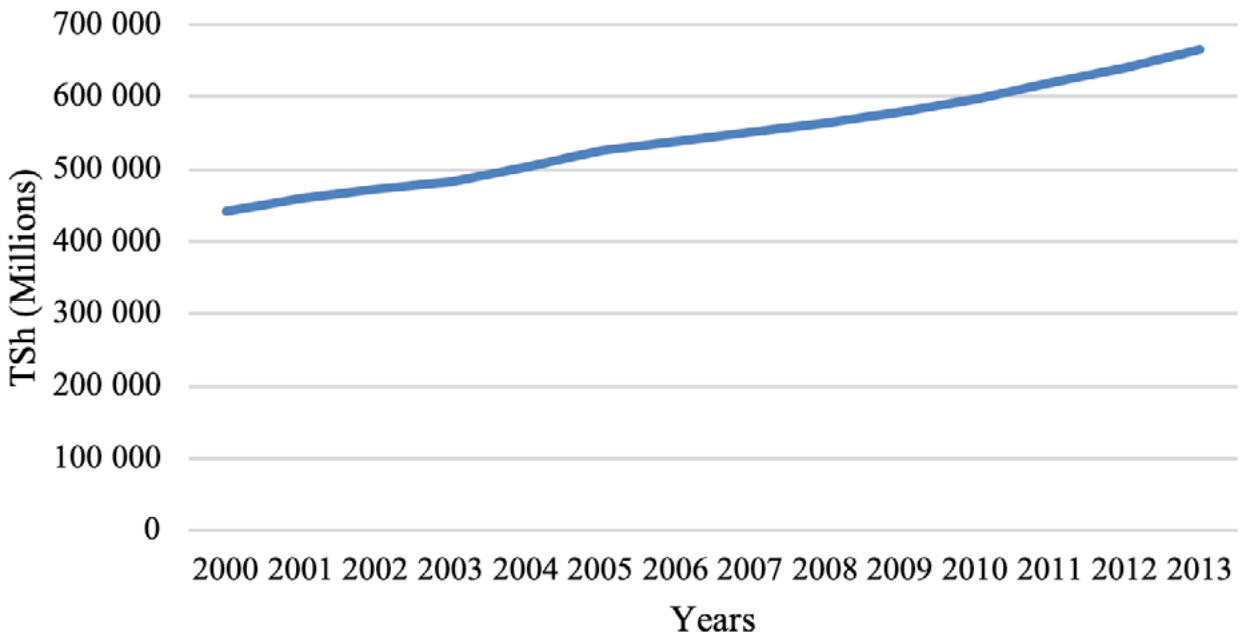

Figure 19: Livestock Gross Domestic Product at 2001 Prices. Source: URT, (2014)

i. Agricultural productivity is low and is rising slowly

Improving the productivity and efficiency of the agricultural sector has been one of the key policy priorities in Tanzania over time. The agricultural reform programme has been intended to increase productivity and improve allocative efficiency through more market-oriented policies. The agricultural policy reforms have brought about important improvements, but the productivity and efficiency of the agricultural sector in Tanzania still remains low. Agricultural productivity is well below that of the non-agricultural sector and, as agriculture employs over 70% of total workforce, its low productivity is a major impediment to overall productivity. This low level of productivity and efficiency can be attributed to several factors, such as various structural impediments – including, for example, socio-economic weaknesses, such as the large number of small and subsistence farms, the use of old technologies, natural conditions, high demographic pressures on land as well as inappropriate policies.

ii. Empower farmers' organizations
There is a need to empower farmers' organizations to have a strong voice and to advocate for the welfare of rural producers.

iii. Increase emphasis on support for Research and Development
The role of public and private research and extension in improving productivity and competitiveness is well established.

Despite these achievements, more action needs to be taken to improve the capacity to adopt and make effective use of technology in the agricultural sector. This requires better co-ordination between the supply and demand of agricultural research and development activities across a wide range of government institutions and with the private sector.

Therefore there is a low appreciation of pastoralism by government officials and the wish for pastoralists to settle and to modernize livestock production. There has been livestock policy (2005), agricultural policy (2013), wich was revised in 2016, and the national irrigation policy (2009) which aimed at improving the livestock sector, hovewer, in general these policies favour other land uses rather than pastoralism. The net effect of these policies has been the alienation of land on which the pastoralists had depended for their livelihood, as large areas of land have been given over to alternative uses of land, and the pastoralists have become economically marginalized. The growing pressure on the shrinking pastoral resources has resulted into persistent farmer-herder land conflicts which sometimes leading to bloodshed.

This problems will continue to affect pastoralists as the Tanzanian government has reiterated that pastoralism is an outdated, archaic form of living that should not be encouraged any longer. As a result, the decline of pastoral lands in conjunction with frequent drought arising from climate change effect has led to increased numbers of pastoralists to move out of pastoralism and to diversify into other economic activities, including crop farming petty trade, and urban wage employment mostly as watchmen. However, outside pastoralism, the pastoralists remain on the fringes of the national economic activities. Those that remain in pastoralism are becoming increasingly vulnerable to stresses, including drought, disease outbreaks, and unpredictable market of livestock products.

5.4 Major Gaps Remaining to be Identified

i. Poor enabling infrastructure
The lack of adequate infrastructure discourages foreign and domestic private involvement. Enabling infrastructure for production, transport, processing and marketing is not integrated in a multi-modal manner, which reduces trade and value addition opportunities. As regards agriculture, insufficient and poor quality infrastructure hinders access to markets and to agricultural inputs and generates significant losses, thereby reducing agricultural productivity. Around 50% of annual crops are spoiled due to the lack of processing capacities. Delayed transportation combined with the lack of cold chains for perishable products leads to substantial trade losses and high marketing margins. Given these infrastructure constraints, Tanzania has not been able so far to build on its geographic potential for serving as a competitive trade hub in the region.

ii. Weak land tenure security for smallholders
Tanzania's existing land legislation (Land Acquisition Act 1967; Land Act 1999; and Village Land Act 1999) (Ngemera, 2016), provides the legal and procedural framework for transactions to acquire and dispose of land. In this regard, Tanzania has dual land tenure systems namely: customary (deemed right of occupancy whereby village land with or without time limitation is allocated to an individual or group of individuals; and statutory (granted right of occupancy) where reserve land is allocated through a periodic title deed of 33, 66, or 99 years depending on type of land use (ESRF, 2014). In an attempt to encourage land registration in the country, various development partners are currently supporting land titling in different ways and in selected areas, though with limited coordination. For instance, the Ministry of Lands is implementing the Land Tenure Support Programme (LTSP) in three districts, Kilombero, Malinyi and Ulanga, in Morogoro Region (Sulle, 2017). Despite all these efforts, still land registration rates remain very low in Tanzania (OECD, 2013). As a results, the number of land conflicts are increasing between different land users,

particularly pastoralists and farmers which limit agricultural growth and investiments.

iii. Regulatory restrictions to agricultural trade

While they play a valuable role in convening stakeholders and monitoring quality, the regulatory restrictions to trade imposed by some boards may increase the costs and the uncertainty for investors. Agricultural trade is also hindered across borders because of long goods clearance at customs offices. In addition, periodic export bans on maize and rice can prohibit access to larger and often closer regional markets and may thus reduce farmers' incentives to increase production.

iv. Limited access to finance in agriculture

While the financial sector has developed quickly over the last few years, it remains highly concentrated and dominated by over-liquid banking institutions. In 2011, only 8% of the rural population had access to formal financial institutions (banks and insurance companies) (IMF, 2016). The reason for small access to finance in agriculture is because agricultural income is generally considered to be volatile due to its dependencies to production (weather, pests and diseases) and market (commodity prices) risks (Moshi, 2017).

Credit from commercial banks has increased significantly over the last five years but only 12% of this credit went to agriculture (URT, 2017a). Only 8% of the domestic lending to agriculture went to agricultural production, with the rest channeled to agricultural trading. Despite the considerable support given to microfinance in recent years, the impact of microfinance on access to financial services has been negligible. Microfinance institutions have been lending at higher interest rates than commercial banks, averaging 30% (URT, 2018). Savings and Credit Cooperative Societies (SACCOS) may have the greatest potential to expand credit supply to agriculture. While their number has been growing, it remains too limited to meet demand in rural areas. Furthermore, they remain largely unregulated, resulting in high variations in service quality and management practices. The lack of collateral represents a critical issue to access both formal and semiformal credit.

6. CONCLUSION

The study was undertaken to investigate the local and regional variations in conditions for agriculture and food security by identifying the factors that are responsible for the disparity in agricultural performance in Tanzania. The study reveals that there is a difference in agricultural and productivity among regions. It was also found that considerable amount of variation in production and productivity exists among the regions. For the food crops, the total cropped area and productivity is higher in the southern highlands compared to the central and northwestern regions part of Tanzania. There has been a slow and unbalanced agricultural growth among regions in Tanzania over the years. The factors range from variation in climate and topography, farming system, social cultural, and enabling physical infrastructure and access to markets. There is a need for taking some immediate steps to put a check in this disparity and lop-sided growth of the regional economy and should be given special priority to bridge-up the immense development by the proper agricultural policy.

Further, policy and institutional context in Tanzania are diverse and influenced by historical, structural, ideological and policy formulation process-based factors. Achieving food security for all in Tanzania requires appropriate institutional and policy reforms. However, the success of policy and institutional reforms is intricately linked to the capacity of the organizations and actors involved in these processes. Moving the policy and institutional reform agenda forward will require higher level of political commitment, increased investment support, systematic capacity development at the organizational and individual levels, functioning monitoring and evaluation system, and improved research-policy linkages.

In general the policy reforms which Tanzania has undertaken since independence seem to have worked, however some social indicators actually deteriorated while others remained more or less unchanged despite rising incomes. To increase more yields farmers should be motivated to give more emphasis on adopting better farm technologies such as irrigation, investments in high yielding varieties, fertilizer and improved cultural practices. For the government, it should actively take initiative for development of irrigation, flood control and drainage, agricultural research and extension. This is due to the fact that for most of the major crops, it was found yield increases have been relatively more important, regardless of the level of increased output, which reflects the adoption of new technologies and inputs that made it possible to intensify land use.

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APPENDICES

Appendix 1 Major Farming Systems in Tanzania

No.	Farming systems	Location of the systems	Remarks
1	Banana/Coffee/ Horticulture system	Kagera, Kilimanjaro, Arusha, Kigoma and Mbeya Regions	Tree crops, high intensive land use, volcanic soils with high fertility, land scarcity
2	Maize/Legume system	Rukwa, Ruvuma, Arusha, Kagera, Shinyanga, Iringa, Mbeya, Kigoma, Tabora, Tanga, Morogoro, Kahama, Biharamulo	Land not scarce, shifting cultivation, maize & legumes, beans and groundnuts intercropped, Arabic coffee
3	Cashew/Coconut/ Cassava System	Coast region; eastern Lindi and Mtwara	Low rainfall, low soil fertility, cassava, coconut and cashew, land is not scarce, shifting cultivation
4	Rice/Sugar cane system	Alluvial river valleys	rice and sugarcanes
5	Sorghum/Bulrush millet/ Livestock system	Sukumaland; Shinyanga and rural Mwanza	Sorghum, millet, maize and cotton, oilseeds and rice, intense population pressure, declining soil fertility
6	Tea/Maize/Pyrethrum system	Njombe and Mufindi districts in Iringa region	Tea, Maize, Irish potatoes, beans, wheat, pyrethrum, wattle trees and sunflower
7	Cotton/Maize system	Mwanza, Shinyanga Kagera, Mara, Singida, Tabora and Kigoma, Morogoro, Coast, Mbeya, Tanga, Kilimanjaro and Arusha	cotton, sweet potatoes, maize, sorghum and groundnuts, intensive cultivation, livestock kept
8	Horticulture based system	Lushoto district; Tanga region, Morogoro rural; Morogoro region and Iringa rural in Iringa region	Vegetables, (cabbages, tomatoes, sweet pepper, cauliflower lettuce and indigenous vegetables) and fruits, (pears, apples, plums, passion fruits and avocado), Maize, coffee, Irish potatoes, tea and beans
9	Wet – rice and irrigated system	river valleys and alluvial plains, Kilombero, Wami Valleys, Kilosa, Lower Kilimanjaro, Ulanga, Kyela, Usangu and Rufiji	
10	Pastoralists and Agropastoralist System	Semi-arid areas i.e. Dodoma, Singida, parts of Mara and Arusha; Chunya districts, Mbeya and Igunga district in Tabora doughter	Deep attachment to livestock and simple cropping system ,shifting cultivation of sorghum millet, moderate population density 30 per km^2, limited resource base and poor and variable rainfall.

Appendix 2: Major policies and programmes

i. Key Sector Policies

- The National Agriculture **and Livestock Development Polices**, which elaborated areas of emphasis for the development of the agricultural sector in crop development, livestock, and fisheries for the achievement of food self-sufficiency and overall rural development. This policy was revised to create with the National Livestock Policy of 2005 and the National Agriculture Policy of 2013.
- **The Land Policy**, which promotes and ensures a secure land tenure system and encourages the optimal use of land resources for human settlements and for agricultural development.
- **The National Environmental Policy of 1997**, which promotes sustainable agriculture with a focus on protection and conservation of the environment, especially by reducing soil deterioration, preserving water catchments, and mitigating actions that foster environmental deterioration.
- **The Agricultural Marketing Policy**, which aims to develop an efficient, effective, flexible, accessible, and equitable agricultural marketing system.
- **The National Irrigation Policy**, which emphasizes sustainable availability of irrigation water and its efficient use for enhanced crop production, productivity, and profitability for food security and poverty alleviation.

ii. Policies That Facilitate the Implementation of Key Sector Priorities

The second category comprises policies that facilitate the implementation of the priorities identified in the key sector policies. These include the following:

- **The National Microfinance Policy**, which aims to achieve widespread access to microfinance throughout the country. Since credit is a major impediment to agricultural development, the policy focuses on the provision of low-cost financial services to households, small-scale farmers, and small and micro-enterprises in both rural and urban areas.
- **The National Transport Policy,** which recognizes the importance of infrastructure for agricultural development and aims to promote development of rural infrastructure, especially feeder roads, to facilitate agricultural trade and growth.
- **The National Information and Communication Technology Policy**, which promotes the use of information and communication technology in agriculture to enhance access to information, promote market links, and foster business growth in the rural sector.
- **The National Trade Policy**, which explicitly promotes agricultural marketing activities. The policy focuses on rationalizing the tariff structure, adopting a fair taxation system, upholding standards to enhance competitiveness, and promoting market linkages and agricultural exports.
- **The Water and Irrigation Policy**, which recognizes that Tanzania's agriculture is risky, partly because of the unpredictability of rainfall and the subsequent calamities of droughts, floods, or poor harvests. The policy aims to promote access to water for agriculture to increase productivity through irrigation.

iii. Policies That Focus on Growing Business in Agriculture

The third category is made up of policies that focus on growing business in agriculture by adding value to and tapping business opportunities along the value chains. These policies include the following:

- **The Small- and Medium-Enterprise Development Policy** which aims to address the constraints that hinder the development of enterprises, especially in rural areas, and to tap the full potential of the small- and medium-enterprise sector.
- **The National Investment Promotion Policy,** which aims to create a favorable environment for private-sector investment in various sectors, especially in agriculture. It provides incentive packages for investors and endeavors to reduce the cost of doing business in Tanzania.
- **The Co-operative Development Policy**, which provides a framework for restructured cooperatives to operate on an economically viable basis. The government recognizes the great potential that cooperatives play in the provision of farm implements, technologies, and information, and the improvement of social and economic conditions of small agricultural producers.