

# The Role of Agriculture in the Economic Growth and Poverty Reduction in Tanzania

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## Abstract

Agriculture's importance to poverty reduction goes far beyond its direct impact on farmers' incomes, however, the economic steady and fast growth has not shown significant reduction of poverty. The challenges caused by limited access to "opportunities" led to rural households operating in the small land for subsistence with very slim profit that limits saving ability. This paper aimed at assessing agriculture's wider role during economic growth and its impact on poverty reduction. The study found that increase in population (household size in rural area) and poor public services in rural exacerbating poverty and accelerate shifting from agriculture to non-agriculture activities especially educated youth, thus, structural transformation. However, there is considerable room for improvements in allocating available resources efficiently to ensure farmers benefit from the growth. Enormous efforts have been made to the smooth changes which call for serious attention to the planners to review strategies, policies and programme.

**Keywords:** Agricultural, Economic growth, Inclusive Growth, Poverty, Tanzania

*\*This paper discussion reflects the views of the authors, not necessarily those of the CAAS or FAO (or its member governments).*

## 1. Introduction

Agriculture's importance to poverty reduction goes far beyond its direct impact on farmers' incomes, as it is the driver for the economy and the best hope for the food security in Tanzania, Africa and world at large. Agricultural development has benefited millions through higher income, more plentiful and cheaper food and generates patterns of development that are employment-intensive and benefit both rural and urban areas. More important it has contributed to the economy even outside agriculture where growth and job creation are faster and has raised wages. Tanzania's economy has responded to the structural transformation with steadily increasing shares of total GDP from the services sector (increased to 48% in 2013 from 14% before 2000) with the share of the agricultural sector in total GDP fell tremendously from almost 50% (1990) to 23.8% (2013)(World Bank, 2015). Decreasing agricultural contribution is affected largely by low productivity, surprisingly; increasing levels of off-farm employment are not associated with low productivity but rather with continued low returns in the sector and limited incentives for increasing production and trade, especially in food crops. The majority of smallholders remain cut off from the benefit of economic growth story with little access to technological improvements, market access and inputs that enhance productivity, regardless of the input subsidy scheme programme which did not benefit poor farmers (URT, 2009). Government intervention has been underway for five decades now, but unfortunately there is no substantial change to the lives of the rural poor.

Willingness for interventions through strategies/programme development took precedence over a decade now, but implementation on the ground is still a challenging, simply because approaches toward problem tackling were not in favor of poor farmers. For instance *Kilimo Kwanza* (agriculture first) was a hope for the rural poor farmer to sustainably boost their productivity and incomes, but before picking up and give promising result, it was shadowed by Southern Agricultural Growth Corridor of Tanzania (SAGCOT) then replaced by a newly formed initiative called "Big Result Now". The question is, what is new for poor farmers in all these replacement of strategy within very short time period? The experience of weak farming practices of farmers are the common in most of developing countries, whereby farmers operate low-technology businesses on small and fragmented plots of land without access to proper infrastructures, proper inputs and other productivity enhancing methods(Duursma et al., 2012). This weakness can be triangulated and used as strength to rectify the system that have been doing thing for traditional for years, for instance land inheritance to a member of families for cultivation range from 0.2ha to 2ha, besides, 70% of the land is hand tools worked, reliant on rain-fed farming, mostly without the use of proper inputs. The evidence shows that, only 11 percent (about 44 million hectares) of the total arable land under cultivation are owned by smallholder farmers in Tanzania (Wolter 2008). The planted area has been stable for some years, indicating that land expansion has ceased to be a major source of agricultural growth. Agriculture growth has been stagnated, slowing wider economic growth and exacerbating poverty with it. The situation has led to skepticism as to whether agriculture can still deliver growth and reduce poverty in today's challenging context.

This paper provides the assessment of agriculture's wider role during economic growth and investigates its impact in poverty reduction, particularly through accelerating economic growth and over all contribution to rural livelihoods. The major and basic question that will be answered is whether Agricultural sector is responding to the development challenges of economic growth and poverty reduction during growth and transformation process. The in-depth study looked at the potential to improve agriculture's impact on growth and poverty reduction in a cost-effective way relative to investments in nonagricultural sectors and investigate policy priorities towards poverty reduction and growth strategies and their ability to develop rural area. In fact, none of the country has ever successfully reduced poverty through agriculture alone, nor none of any country has achieved it without first increasing agricultural productivity (DFID, 2005).

## 2. Tanzanian Agriculture, Poverty and Economic Status

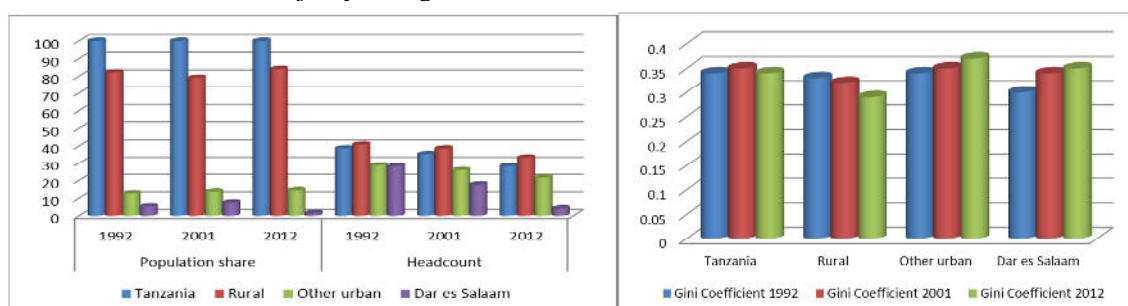
### 2.1 Agricultural Situation

Agriculture is known as a backbone of Tanzania for many decades now from the fact that it employs many people than any other sector (62.8% <sup>7</sup>in 2013) (NBS, 2014a). About seventy percent of Tanzanian live in rural area and own land or farm and engage at least in one form of agricultural activities. However, the average per capita holdings is 0.12 ha, and majority of farmers are small scale, operating between 0.2 and 2.0 ha, producing for subsistence (NBS, 2013). The reason for producing for subsistence is that agriculture is taken as a last resolution after failing to get opportunity in nonagricultural sector elsewhere. Nevertheless, commercial agriculture requires massive investment on; infrastructure for irrigation, farming skills, research and technology, of which small scale farmer cannot afford. Unfortunately, increase in the cost of living created tension among farmers and non-farmers, with a scenario that, most government employee are engaged in agriculture activities to supplement their low income.

Most small scale farmers who operate in the small area for subsistence have very slim profit and low chance for their income to generate opportunities. Insufficient effort towards rural development and poverty reduction are exacerbated by the low profitable investment opportunities, or by inability to save. Vast research shows poor households with little wealth have to work on non-agriculture to support their livelihood. Albeit, wealthier households invest in more profitable activities such as keeping cattle and fishing boats, whilst poor household compliment agriculture with casual labour, bricks or charcoal making and or owning trading shops(Sarris, Savastano, & Christiaensen, 2006). However, population growth has created a demand and pressure for the immediate need for increase in food supply which trigger demand for improving productivity for all farming activities.

### 2.2 Poverty Situation

The number of poor people increased from 11.5 million (2001) to 12.8million (2007) (Policy Forum, 2010), which was contributed by increase in number of population from 34 million in 2000 to 39 million in 2007. However, individual people reduce poverty through shift from agriculture to nonagricultural hope to increase their income, which cause majority to migration from rural to urban area.



Source: Household Budget Surveys of 1992, 2001 and 2012. Authors' own calculations

Figure 1: Poverty Headcount, Population Share and Gini coefficient for 1992, 2001 and 2012

For the past 20 years (1992-2012) poverty dropped from 28.1% to 4.2% for Dar es Salaam and from 28.7% to 21.7% for other urban area and a slim drop from 40.8% to 33.3% in rural area. This indicate that huge drop in urban area is contributed by labour force shift from rural to urban. However, the huge drop in Dar es Salaam caused by huge share of 50% of the total FDI stock and flows (Robert J Utz, 2008)which might not be a good example for poverty reduction strategy in the country.

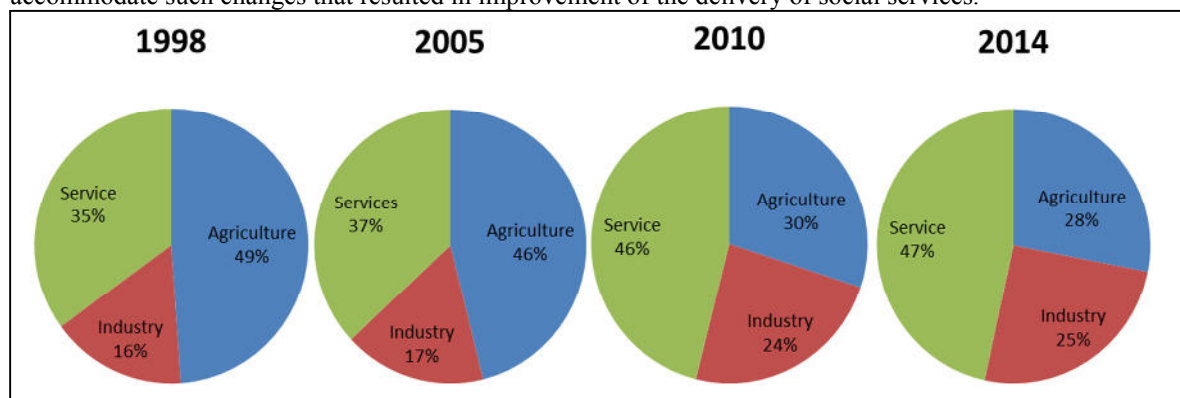
### 2.3 Economic Situation and Fiscal Position

<sup>7</sup> Tanzania agriculture employment amounted to 62.8%, where by 76.4% are in rural area and 26.4% are in urban area.

The performance of Tanzania economy has a long history, looking at its progress of growth from 4.2% (1995) to 7.4% (2013) with an inflation rate dropped from 27% to 6% in the same period of time (NBS, 2014a). In 2000, the progress in macroeconomic stabilization was based on strong fiscal policies resulting in an overall budget balance, after grants element of concessional loans that remained positive throughout the period and mainstreamed in government's objectives and targets. Based on GDP growth, the economy appears to be stabilizing and pose higher level of growth in the long term. In 1990-1999 the GDP grew at an average of 4.9% and in the period of 2000-2010 grew at an average of 7% and in the period of 2010- 2014 grew at an average of 7.4% (NBS, 2014a).

However, the economy is vulnerable to external shocks; low domestic saving; a heavy external debt burden; and high poverty incidence, and is continues to face a number of challenges. The history tell us that the socialist and "self-reliance" policies which was implemented after independence in 1961 lead to improving social indicators but proved to be unsustainable, whereby, per capita economic growth rates turned negative in the late 1970s and early 1980s. Supported by the IMF, World Bank, and bilateral donors, the first comprehensive structural adjustment program was embarked in 1986, with the aim of dismantling the system of state controls and promoting the private sector (Kyejo, 2000).

Later the progress from self-reliance and government control of production mechanism was moved away and replaced by a market- based economy. The market oriented economy was pretty much better at the end of 1999 where many structure were in place (Kyejo 2000). Many policies were developed/modify to accommodate such changes that resulted in improvement of the delivery of social services.



Data Source: Bank of Tanzania (BOT) 1998, National Bureau of Statistics 2005 & 2014, authors own calculations

Figure 2: Comparison of the Percentage Contributed in GDP by Sector 1998, 2005, 2010 & 2014

In 1998 GDP growth emanated mainly from good performance in non-agricultural production. Agriculture, in the same year contributed 48.9 percent to total output and grew at 4.1 percent, while service sector including tourism contributed 16.0 percent and grew at 6.0 percent. However, the rate of growth of service sector showed potential for growth which was later revealed in the middle of 2014 (figure 2).

However, since 2000 the share of agriculture to GDP has been declining with average growing rate of only 4% annually. Despite of favorable climatic conditions for cereals production, the yield for the dominant staple food (maize) recorded at an average of 0.88 tons per hectare, which is very low compare to international yield per hectare. Compared to the population growth rate and maize productivity rate in 2000-2007; growth rate was 3% while maize productivity was 2%, it is regrettable due to the fact that a high growth in maize production would reduce poverty, while simultaneously improving food security of poor households (CAADP 2009).

### 3. Methodological Research Approach

#### 3.1. Data Sources and Analysis Techniques

The study based on a quantitative research approach, represented on exploratory, explanatory, and descriptive, based on agriculture growth and development trend over a period of 1965 - 2013. The study employed secondary data culled from Tanzanian National Bureau of Statistics (NBS) surveys in different periods from 1980-2014 as well as data or information from Bank of Tanzania (BOT), Ministry of Finance, Agriculture Food Security and Cooperatives, Ministry of Livestock and Fisheries Development and Ministry of Market and Trade. Other information from 1965-2015 was gathered from reports from World Bank (WB), Food and Agriculture Organisation of United Nations (FAO), Oxford Poverty and Human Development Initiative (OPHI) and Tanzania Investment Center. The rationale for using secondary data in this study based on the nature of the study which required time series data. The data and information gathered used in triangulating the facts that relate agriculture growth and development to the poverty reduction and economic growth of the nation. Quantitative

techniques were employed based on the relevant research reports and origin of the data, such as World Bank indicators, NBS statistic guideline, FAO and International Monetary Fund (IMF) suggestions. The study used statistical package for social sciences (SPSS) to run ordinary least squares (OLS) for censored and effect and correlations for relation between parameters.

### 3.2. The Conceptual Model

The conceptual framework is based on research contributions by data gathered from the surveys carried out by National Bureau of Statistics (NBS) (i.e. Agriculture sample census 2007/08, National Panel Survey 2010/11, 2011/2012 and 2012/2013, household budget survey 2011/12 and National census 2011/12. The model is composed of one dependent variable poverty and took into account important measurement of agriculture growth and economic growth to understand how poverty reduction is impacted by development of agriculture and economic growth pattern. In regards to conceptual model, the study used policy and strategies/programme developed as one of the moderating variable which relates to poverty but also connected to the agriculture growth and economic growth.

### 3.3. Conceptual equation

Increase in agriculture growth decrease poverty and has positive effect in the economic growth and vice versa. The statement can be proved by relating poverty and economic development equations as shown below; The Economic growth (GDP) equation is; C is consumption, G is government spending, I is investment, E is exportation and M is importation.

$$GDP = C + G + I + (E - M)$$

Assume balance of export and import are equal then  $(E - M) = 0$  and  $(C + G)$  is income denoted by Y and I is investment in Agriculture denoted by A then,

$$GDP = Y + A \tag{1}$$

Then take Q2-Q1 where by  $GDP - P = Y - Y + A + A$

$$GDP - P = 2A \tag{2}$$

Assume Agriculture investment contribution to the GDP by 1/2, then,

$$A = GDP - P$$

$$GDP \propto A + P \tag{3}$$

This means increasing agricultural growth will direct reduce poverty at the same time increase economic growth. In the regression analysis the model used was

$$P = \alpha + \beta \sum_{i=0}^n F_i + \varepsilon_t$$

Where P is poverty and  $F_i$  are the factors that affect poverty acceleration and  $\varepsilon$  is error term.

## 4. Results and Discussion

### 4.1 Poverty Eradication Measures and Sustainability

MDG-based poverty-monitoring system was established to provide information to structure Poverty Reduction Strategy. Since poverty is concentrated rural areas, government tempted to increasing funding to agriculture which address rural poverty and food security better, whilst for sustainability approach would have been better to improve education and health. Abolition of primary school fees contributed to the high enrolment level of pupils in primary school from less than 31 per cent in 1990 to nearly universal enrolment by 2012 (Lyatuu, Nie, & Fang, 2015). The huge increase was reported in 2000-2007 (30%), with a slightly decrease of 5% in 2007-2012. However, increased enrolment rate creates major challenge of insufficient facilities to handle the number of pupils increased. The overcrowding in a class frustrated many pupils and teachers which resulted into the distortion of quality of education in public sector. Few teachers were forced to take more pupils which made the class too big to be handled properly, at the same time there were shortage of desks and classes to accommodate everyone (Lyatuu et al., 2015).

*"It is shocking to have a poverty line as low as \$1.25 per day with 1/7th of the world's population lives below this line. The levels of inequality and poverty that prevail in the world today are totally unacceptable". Said Kaushik Basu, a Senior Vice President and Chief Economist, World Bank Group (2014).*

Table 1: Education and Health Trend between 1990 and 2012

<b>Education and Health</b>	<b>1990</b>	<b>2000</b>	<b>2007</b>	<b>2012</b>
Percentage of adult men with any education	83	83	83	87
Percentage of adult women with any education	68	67	71	76
Primary net enrolment ratio	–	59	84*	<b>78*</b>
Percentage of children age 7-13 years currently studying	57	61	86*	<b>82*</b>
Secondary net enrolment ratio (forms I-IV)	–	5	15*	<b>29*</b>
Percentage of ill individuals who consulted any health provider	–	69	69	71
Proportion of households with any toilet facility	93	93	93	<b>88*</b>

\*Shows significant different from the past years

Data Source: Tanzania National Bureau of Statistic, Authors' own calculations

The problem accelerated to secondary school, for example in 2000 there was only 5% enrollment rate which tripled (15%) in 2007 and later increased to 21% in 2012. The overcrowding issue for secondary school was resolved by ensuring at least each ward has one secondary school. The mushrooming of secondary school was so ambitious and left out school without teachers or facilities such as laboratory and hostels to accommodate few students who lives far from schools. Incidence of students renting room close to schools happened which did not only affected quality of education but also increase dropout due to pregnancy incidences (IRIN, 2007; Lyatuu et al., 2015). Similarly, the rate of adult with education was constant from 1990 to 2007 and increase slightly in 2012 (table 1). With exceptional that women's adult with education increased in a period of 1990 to 2012, with indication that man's adult with education decreased in the same period (table1). Healthy issue seems to deteriorate, as the number of patient to doctor ration was constant from 2000 to 2007 but there was slightly increase in 2012. Household with toilet decreased in 2012 after being constant from 1990 to 2007 (table1), despite of high budgetary allocation to education and healthy.

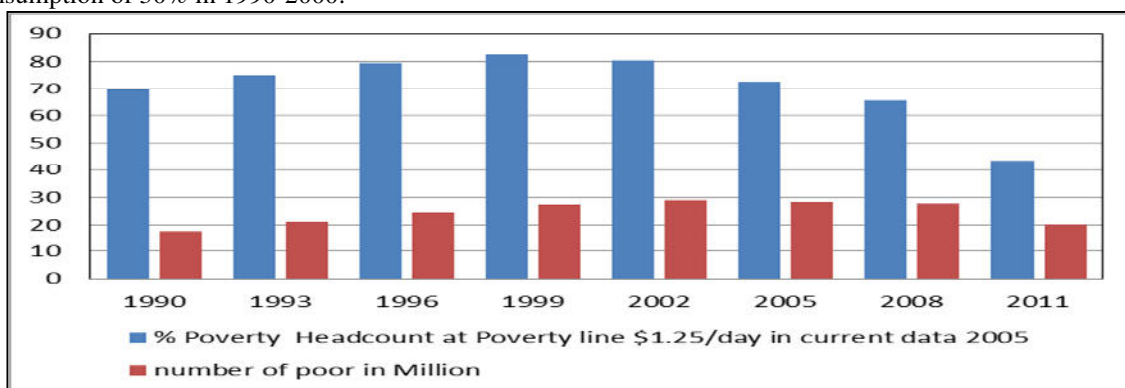
Comparing education impact to the poverty reduction rate in the same period of 2000- 2007 and 2000-2012, there is direct relation between reduction in poverty between rural and urban. In 2007-2012 the overall decrease in poverty rate recorded 18%, with remarkable decrease in urban area (41%), and less in rural area 12% (table 2). When incomes grow, consumers increase their consumption of manufactured goods and services faster than their consumption of food (Cervantes-Godoy & Dewbre, 2010).

Table 2: Poverty head count Rates, Gini Coefficient and Income in different period from 1990 to 2012

<b>Year</b>	<b>Poverty Rate by Area</b>			<b>Gini</b>	<b>% average income or consumption</b>
	<b>Urban</b>	<b>Rural</b>	<b>Tanzania</b>		
1990	-	-	-	0.3383	33.42
2000	0.234	0.386	0.356	0.3462	25.68
2007	0.218	0.374	0.334	0.3758	36.79
2012	0.155	0.333	0.282	0.3782	55.91

Source: NBS Tanzania data, author's own calculations

Unfortunately, there was an increase in inequality for all periods with high record (7.88%) in 2000- 2007 and low (0.63%) in 2007-2012 (table 2). Since decrease in poverty goes with decreasing inequality, therefore decrease in poverty is proportion to all classes of income (rich and poor). Nevertheless, records shows that in 2007-2012 there was an increase in the income or consumption to 34%, compared with low income or consumption of 30% in 1990-2000.



Data source: World Bank, authors own calculations

Figure 3: Poverty headcount and number of poor for three years intervals from 1990 to 2011

The figure 3 shows that from 1990 the poverty increased but since 1999 the poverty started to decrease. The decrease was contributed by transformation of agriculture which started in 1990 but being effective in 1999 almost 10 years later.

## **4.2. Agriculture Role to the Economic transformation**

The agriculture which is major sector that feed a nation, support other sector to grow easily if social protection, agriculture innovation and investment are prioritized and only if inputs are available to the farmers, market for farmer's produce are in place with minimum cost associated with transportation and reasonable tax, last but very crucial is if the policy support small farmers to grow and encourage more people to invest in the field.

### **4.2.1. Social Protection to Farmer**

Social protection is important for a minimum level of well-being and social security for people living in rural poor. Well-structured social protection minimizes risk of investment in agriculture and benefit agricultural growth more directly. Assurance of a safety net to farmers in terms of support for the unexpected shocks encourages investment and innovations as well as providing favorable environment for agricultural business. In fact, social protection is an investment for future growth as it helps families to break poverty cycles through health and education investment for their children. Actually, careful choice of policy and proper strategies to be implemented in a certain time ensures social protection is complementary to growth (DFID 2005). For instance, implementation of the voucher subsidy input in Tanzania for the period of 2009-2013 allow poor farmers to acquire inputs that were not able to be afforded before. But on the other side it distorted input market and prices, consequently, there was an increase in dependency for the farmer to the free inputs and reduces a deliberate effort to the agriculture investment. DFID (2005) argued that interventions that target agriculture as a safety net may be less successful than strategies to harness agriculture for growth.

### **4.2.2. Investment in Agriculture**

Insufficient infrastructure and low government support put the expansion of agriculture into areas where the land cannot support, the areas with good-quality soils being taken for non-agriculture activities leaving bad management of intensive farming caused by poor policies and incentives and the inappropriate use of technologies. However, public spending should be invested in the roads construction, railway construction, education, irrigation infrastructure and agricultural research to easy farmer's produce supply to the market, better knowledge in agriculture as well as access to the input supply. For example the Indian's green revolution, government spending on agriculture was done by ensuring every rupee invested generated returns of almost nine times the amount increased in agricultural output in the 1960s(DFID 2005). Unfortunately, public investment for agricultural support is very low and is poorly focused, this is from the fact that agriculture is taken as last resort for anyone who failed to get income in nonagricultural, since agriculture is taken as a risk business.

### **4.2.3. Agricultural Irrigation Potential**

Quick way to generate income to local farmers is to reduce obvious risks. Tanzania has possible irrigated land of 90,400 square km, but only 1,843 square km (2003) was the irrigated land, which is about 0.63%. Wolter (2008) reported that out of 29.4 million hectares (i.e. 31 percent of the total land area) with irrigation potential, only 227 490 hectares (less than 1 percent) are under irrigation. This is also reported by NBS (2014b) that the irrigation potential in Tanzania is 29.4 million hectares out of which 2.3 million hectares are high potential, 4.8 million hectares are medium potential and 22.3 million hectares are low potential. Use of development incubator concept or idea-Lab will make quick change good example is KickStart Irrigation Pump (Dutt et al., 2007).

However, government focuses on Agricultural Sector Development Programme (ASDP) on irrigation since 2013, but there is no significant difference. Even though the importance of irrigation to reduce Tanzania's dependency on rainfall is undisputed, yet it would have been better to have a two-fold programme with one part focusing on production-related investments such as irrigation and the other fostering commercial agriculture and the private sector (Wolter, 2008). The concept should be originated from farmers by identifying appropriate product or services that answer local needs inquiries (Dutt et al., 2007).

### **4.2.4. Input Access and Application**

Generally, application of fertilizers (organic and non-organic) is low in most part of the country. Application of fertilizer was reported to decline immediately after phasing out of fertilizer subsidies which was given between 1991 and 1994. The re-introduced National Agricultural Input Voucher Scheme (NAIVS ) in 2008 increased inorganic fertilizer usage. Most targeted area for high use of fertilizer is southern highland corridor specifically Ruvuma and Mbeya. However, it is surprising that NAIVS did not make any difference in the field as application remained almost the same (15%-20%).

Improved seed usage has been fragile; no wonder the study found that the proportion of farmers purchased seeds dropped from 35 percent to 28 percent (statistically significant at a 95 percent confidence interval) in 2008 and 2013 respectively, despite the fact that the farmers were subsidized. However, use traditional seeds decreased from 27 to 20 percent, meaning farmers shift from traditional to improved seeds.

Table3: Proportion of Households using Fertilizer, Seeds and Pesticides

INPUT USED	2007	2013
Any fertilizer	30.1	32.1
Organic fertilizers	22.0	21.4
Non-organic fertilizers	12.8	16.5
Vouchers for non-organic fertilizers	-	50.0
Pesticides/insecticides	14.7	13.0
Improved Seeds	16.9	16.8

Data Source: NBS national panel data survey 2012/2013

Traditional seeds are originated from farmer's pool of produce harvested from previous years, which are more diverse with distinct gene pool of different farms, which is good for larger diversity of gene pools within each crop although it has low yield.

#### 4.2.5 Market access and Farmers Participation in the Market

Proper functional markets is the major challenge for the Tanzania, since there are the most contentious area in the agricultural policy debate—but must be tackled. The existing few markets are incomplete due to the facts that, there is; insufficient access to the market information, low access to finance and insurance market, reduce the volatility of prices of the important product in the markets, poor linkage of small producers to the established market, unnecessary restrictions and controls on the sale and purchase of agricultural products and lack of proper standards for quantifying and grading products. Albeit combination of agricultural risk, insufficient borrower information, cumbersome legal procedures and high transaction costs mean that many financial service providers are reluctant to serve small farmers. Looking at the real effect of market of agricultural products between 1980 and 2003, the prices of agricultural raw materials and food and beverages fell by 60% and 73%, respectively (UNCTAD, 2003; DFID, 2005). In 2003, coffee and cotton prices were 17% and 33.5% of their 1980 real values. However, in 1997 to 2001 the combined price index of all commodities fell by 53% in real terms (DFID 2005; FAO 2004). Sometimes increasingly stringent product standards are also being imposed for reasons of food safety or to protect domestic agriculture from imported animal or plant diseases, affect the price and the farmer's income.

Table 4: Proportion of households stored, sold and experienced lost in 2007 and 2012

Item	2007	2012
Households sold at least part of their harvest	0.29	0.34
Households sold maize	0.28	0.34
Households sold paddy	0.46	0.42
Households experienced loss of crops	0.14	0.09
Households stored at least part of harvest	0.30	0.24
Smallholder farmers in Contract farming or out-grower scheme	0.01	0.014

Data source: Tanzania National Bureau of Statistics National Panel survey 2011/2012

Farmers participation in contract farming or out-grower scheme is considered as a reliable measure to help increase farmers' income. Contract farming provides direct access to the market information, high access to finance and insurance market stabilizes prices of the products and create proper link between small producers to the established market and guarantee sales and purchases of agricultural products which have proper standards and are in good grade. Notwithstanding the fact that contract farming is the nascent phenomenon in Tanzania, there is evidence that contract increases farmers' productivity and boost overall production. This study found that only one percent of smallholder farmers participated in contract farming or out-grower scheme in 2007, while in 2012 there was a slightly increase up to 1.5 percent of smallholder farmers engaged in the contract farming or out-grower scheme. It was not surprising that 49 percent of the harvested crops were sold while about 43 percent were consumed by the households in 2012. Albeit, creating effective markets through encouraging full participation of the farmers in a private sector will increase productivity and income.

#### 4.2.6. Policy Support for Agriculture Development

Market and Trade policy, National Agriculture Policy and Livestock & Fisheries policy meant to support economic growth, improving productivity, market access and maintain price stability. However, the policies that encourage farmers to make sound decision on proper allocation of available resources are important to the agriculture development in Tanzania. Farmers have been hurt by overvalued exchange rates, high burden of taxation and policies that kept prices low for the name of food security protection. The efficient and effective policies need effective research and information services that meet the demands and interest of farmers. Even though, Tanzania has many good policies, but it has always faced implementation challenges, a fact that has prompted the authorities to launch the BRN initiatives (Charle et al. 2014). Since the economy is growing rapidly with element of pockets of persistent poverty and slow agriculture development specifically, nevertheless, farm employment will remained to be very crucial. Overall migration of youth seeking job in urban and left out agriculture with less labour force is endanger over all rural development. It is right for anyone to

escape poverty by leaving their home areas, either for the season or permanently, to seek job or food, and on occasion they may even return to agriculture if they secure capital. So agriculture policies should change to reflect the fact that agriculture has opportunity to change lives of people. However, special attention is needed specifically on the government spending in agriculture to avoid effects in agriculture investment as well as in the research and development.

Since majority of Tanzanians live in rural areas and derive much of their livelihoods from agriculture, it is imperative that raising agricultural productivity is not only to increase the incomes of farmers but also to support acceleration of development of non-agricultural activities in rural and urban areas.

#### **4.3. Agriculture Development on the light of Big Results Now (BRN)**

Prior to BRN in 2000-2013, the strategies of the country has been focusing on a few crops and often produced by large scale farmers, which could not have huge countrywide impacts in reducing poverty or improving household income. Albeit, focusing on small scale farmers in the concept of BRN has the potential to transform Tanzania's economy, if it allow naked truth of the proper implementation of the concept deliver results. There are litanies of questions that are still remaining unattended regarding the driving force towards this initiatives; financial capital, mind attitude, political commitment and accountability, or discipline and opportunity costs fears of not delivering results. The most important thing is not to find answers to these disturbing questions but to learn lessons of delivering big and quick results from the previous strategies of the same nature. The strategies and programmes that have been implemented with similar goals to those of BRN pose a glitch and wonder if BRN would make a difference at all to the lives of rural poor.

BRN is a Malaysia model adopted to boost effort to transform the country from low to middle-income economy by 2025, focus is on six priority areas; energy and natural gas, agriculture, water, education, transport and mobilization of resources. The implementation started in the 2013/14 fiscal year under specified timeframe for delivery of public goods and services. To justify use of tax payers' money in the context of cost-benefit analysis and value for money, BRN has to deliver in time. However, fail to hold those responsible for delivery accountable, means the value for money is lost. Critical minds will question the uniqueness of this model compared to other development models that might have not delivered. The key success for BRN is availability of optimal resources, correct mindset, attitudes, disciplines and incentives. The goal will matter when there is improved productivity in rural area as well as poverty is reduced, with clear signs of improvement in the livelihood of rural poor.

#### **4.4. Agriculture Productivity and Poverty Reduction Efforts**

Tanzania's economy is basically agrarian, with the fisheries and livestock subsectors contribute a third of agricultural GDP, and the remained two third is contributed by crop subsector. The fisheries have been steadily growing at a rate of 5.1% per year between 1998 and 2007(CAADP 2009), livestock trailed behind crop with an average growth rate of only 3.3% annually. The slow growth in the livestock sector affects poor household since they depend on incomes from cattle and poultry for their livelihoods.

Government targets to envision competitive and dynamic economy is aimed to be middle income country by the year 2025. To ensure this, effort to transform from low productivity agricultural economy to a semi-industrialized economy has been underway. However, agricultural productivity is interlinked with labour saving and land-augmenting technologies, land tenure system, credit availability, institutional efficiency and availability of quality and quantity of research and development (Limbu, 1995). But with considerable arable land and fresh water flowing in most part that can be utilized for irrigation which in turn may invigorate farmers' productivity, conversely, the arable land and fresh water is underutilized in most part of the country. For example the existing irrigation infrastructure in Tanzania is still poor and inappropriate causing the overall water use efficiency to be very low at an average of 15-20% as the losses in the systems are enormous amounting to 80 to 85% (Mwandosya, 2008). Lyatuu et al., (2015) and Leyaro & Morrissey (2013) argued that balanced growth is achieved if agriculture is commercialized to support growth of nonagricultural sector. Nonagricultural sectors depend on agriculture through processing and agri-business. Unfortunately this has not happened in Tanzania, and the economy remains essentially based on traditional agriculture with low productivity(Leyaro & Morrissey, 2013), so there is need of deliberate effort to revamp agriculture productivity so that the country can meet the target set for TDV 2025.

The analysis of factor input in this study suggest that increase in total factor of productivity reflects both increased capacity use in response to increase aggregate demand and economic efficiency gains in the wake of removal of economic distortions. Nonetheless, innovation and technological changes have small contribution in the total factor productivity in Tanzania (Robert J Utz, 2008). Noteworthy, the structural reform has managed to increase competition in the private sector (Lyatuu et al., 2015) evidenced by number of firms exiting and entering the market, but the firms entering are more competitive than those exiting that suggest increase in the total factor of productivity registered at the aggregate level, as argued by Utz (2008).



#### 4.5 Comparison between Productivity and Population Growth

Compared to the population growth rate and maize and paddy productivity rate in 2000-2007; growth rate was 3% while maize and paddy productivity were 2% and 2.36% respectively, in 2008-2013 the growth rate was 2.7% productivity for maize and paddy were 1.3% and 1.98% respectively, this is regrettable due to the fact that a high growth in maize and paddy production would reduce poverty since are the major food, while simultaneously improving food security of poor households. However, Tanzania had high performance in productivity in the region (table 5).

Figure 5: Comparison of the Agricultural Productivity in East Africa in Different Regime

Regime	Tanzania	Uganda	Burundi	Kenya	Rwanda	East Africa Regional
1965-1976	2.035	4.27	0.83	2.335	-3.14	2.535
1975-1986	3.495	0.42	0.6	-0.765	0.755	1.03
1985-1996	2.635	1.77	1.29	0.545	-1.07	1.875
1996-2006	-5.21	1.04	-0.335	0.42	-1.575	-2.44
2005-2011	4.01	6.66	-0.08	-2.54	12.22	3.13
1965-2011	1.73	1.08	0.74	0.55	0.17	0.96

Looking at the regional efforts; Sub-Saharan Africa is barely kept pace with increasing from 40 to 116 million tonnes of cereals in 2002-2007(FAO 2004; DFID 2005). Most of this (probably 80%) originated from expanding the area farmed, whereby the cereals yields increased from 0.8 to 1.2 tonnes per hectare (FAO 2004; DFID 2005). The counterpart Asia the production of cereal tripled from 309 to 962 million tonnes in the same period. The situation in Tanzania is different, whereby in the same period the average food crop productivity was 1.7 tonnes per hectare, but ideal and well managed field should be 3.5-4.0 tonnes per hectare(FAO 2004; DFID 2005), this indicate that there is a potential to raise productivity to the acceptable level. However, increasing agricultural productivity cause multiplier effects especially on employment opportunities(Lyatuu et al., 2015).

#### 4.6. Poverty Reduction Efforts

Agriculture is critical to achieving global poverty reduction targets. It is still the single most important productive sector with potential of developing in terms of the number of people it employs and available land the nation has(Lyatuu et al., 2015). Agricultural development is essential to stimulate growth in the overall economy within agriculture and nonagricultural sectors. Enormous research has shown that every shilling of growth from agricultural products sold outside the local area in poor Tanzania leads to a second shilling of local rural growth from additional spending on services, local manufactures, construction materials, and foods processing(IDA, 2009). Hence, agriculture growth is good for poor.

Poverty is still pervasive even though the proportion of people living below the basic needs and food poverty lines has fallen, caused by the rate of increase in population of 2.7% (2013)(NBS, 2014a). The rate of increase in population is higher than the rate of reducing poverty; which caused the poverty reduction rate unnoticeable (NBS, 2001, 2007). The rate of reducing poverty from 1990 to 2012 has been very small compared to the rate of increase in population with no significant different in decreasing inequality (figure 6-1a). Going to specificity, Figure 1b shows that people in rural area distribute their wealth equally than people urban areas due to decrease in inequality that recoded with low Gini coefficient compared with previous year (in 2012 was 0.29).

Enormous studies reported agriculture as a good for poverty reduction, with the evidence saying that increase in productivity might not necessarily result in higher wages. Gallup, Radelet, & Warner (1997) and DFID (2005) reported that every 1% increase in per capita agricultural output led to a 1.61% increase in the incomes of the poorest 20% of the population. Similarly, Thirtle, Irz, Lin, McKenzie-Hill, & Wiggins, (2001) and DFID (2005) on their studies concluded that, on average, every 1% increase in agricultural yields reduced the number of people living on less than US\$1 a day by 0.83%.

On the other hand, evidence from numerous studies concluded that land and agricultural productivity must rise in order to reduce poverty, but land productivity must rise faster. This condition is necessary to create additional employment on farms, which benefits the poor and in turn stimulates demand for non-farm goods and services (DFID, 2005; FAO, 2004, 2012, 2013; Lyatuu et al., 2015). However, experience shows that with a strong commitment to develop agriculture through support to the effective development of irrigation and the adoption of simple and new technologies, agriculture has a chance to play a major part in reducing poverty (DFID, 2005; FAO, 2004; Islam & Kinyondo, 2014; Kilama & Wuyts, 2014; National Bureau of Statistics, 2014; Nawe & Hambati, 2014)

Sustained agriculture growth is accompanied by structural transformation, that is, the nonagricultural sector must grow faster than the agricultural sector. However, higher GDP growth in Tanzania is a result of faster growth of industry and services (Lyatuu et al., 2015). Even though changes in the economic structure during recent decades

were driven by the nonagricultural sector, Tanzania remains primarily an agrarian country with an agriculture-based economy that employs the majority of the national labour force (FAO 2013; Lyatuu et al., 2015), with high potential in increasing productivity. However, the decrease in agriculture contribution by half from 48.9% (1990) to 23.8% (2013) did not come with surprise as research results shows decreasing in productivity, with overall significantly effect in the poverty reduction efforts. Sarris et al., (2006) in their studies concluded that agricultural productivity is a significant determinant of household consumption, and hence a determinant of household poverty. Given that agricultural productivity is quite low in absolute terms, a question arises concerning the factors that keep agricultural productivity low and the constraints in expanding agricultural production in Tanzania. Poverty reduction in Tanzania means confronting the problem that farmers face in generating income (Mnenwa & Maliti, 2010), which is overcoming constraints within farming systems. This study analysis found that the rate of increase in population is higher than the rate of increase in food productivity, which suggests being the major reason for the poverty to increase in Tanzania (rate of increase in population is 2.7% while that of cereal food is 1.98%) (table 6).

It appears that in Tanzania there is considerable room for improvements in allocation efficiency by better access to off-farm activities, so that farmers can use available resources efficiently. Deliberate efforts should be dedicated on easier access to credit for expansion of land cultivation in areas with land expansion potential like Ruvuma, so as to utilize more efficiently the excess family efforts. This study argues that major gains to agricultural productivity are to be expected from better village connectivity, especially in relatively isolated regions like Ruvuma. The analysis found high impact when rural infrastructure to the improvement of productivity, hence infrastructure development is the key for agricultural development and poverty reduction.

Table 6 : Empirical results of analysis of factor affect impact of GDP to the participants benefits

Poverty (at \$1.25 a day)	Coef.	Std. Err.	t	Sig.(P>t)	[95% Conf.Interval]	
GDP	-0.00192	0.009450	-0.20	0.841	-0.02186	0.018017
Population	-0.27410	0.146254	-1.87	<b>0.078*</b>	-0.58266	0.034472
Population growth rate	-0.30602	0.042141	-7.26	<b>0.000*</b>	-0.39493	-0.21711
Farmer's income	-0.01229	0.040891	-0.30	0.767	-0.09856	0.073981
Inequality	7.29449	2.611518	2.79	<b>0.012*</b>	1.784672	12.80432
Income (PPP)	0.00236	0.007432	0.32	0.755	-0.01332	0.018041
Cons	0.01864	0.591652	0.03	0.975	-1.22964	1.266912

The efforts imposed have no stable focus on a long term plan in helping people generate a regular and sustainable income flow. This means people are helping themselves to get out of poverty and stay out of poverty. In fact, government support is inevitable in providing conducive environment for the people to be able to generate their own cash income. The question is; where should the government interventions are supposed to be focused? In a nutshell, government commitments and accountability are the main area for priority while everyone else should struggles to produce sufficient food to feed themselves and surplus to feed others. It was estimated that 70% (2012) of Tanzania live in rural area and their primary earnings depends on agriculture. Therefore, government and agriculture stakeholder should support use of available arable land and creating short term solution to increase farmer's productivity. Most and immediate action is to ensure agriculture investment is attractive, specifically infrastructure that have direct support to agriculture development, such as irrigation (to avoid rain-fed dependency) and market, rural-rural and rural urban road connection and electricity supply. It is imperative important that taxation should be carefully reduced to farmer to ensure their efforts pays. Ensure the processing industries are in place to avoid post-harvest loss. To be effective, the labour intensive activities should be given a simple and immediate solution. For example to save farmers time, replacing labour intensive activities with simple and affordable tools. Promotion locally made tools is necessary to boost creativity and enhance farmer's productivity with low costs. Most important is for farmers to change their mind set on producing for subsistence and take agriculture as a business.

#### 4.7. Sustainability of Agricultural growth, Poverty Reduction and Economic Growth

Agricultural sustainability is not an option but necessary due to the fact that it creates balance ecologically, economically, politically and socially today and in the future. In 2025, the UN project estimated the global population to be 8 billion people (UN, 1996). Feeding a population of this size will require world cereal production to increase from 2 billion to 3 billion tonnes (DFID, 2005; Dyson, 1999). Meeting demand on this scale requires agriculture to be intensified with efficient use and well-managed of available resources such as land and irrigation. Conversely, a stagnant agriculture cause by poor use of available resources will lead to the unproductive and inefficient hence unsustainable agriculture with increasing poverty in rural area. However,

climate change poses another risk of the instability. But it's necessary that concerted efforts to develop a range of new technologies and practices; and systems that enable farmers to choose from and obtain appropriate new and existing technologies (DFID 2005). However, Utz & Ndulu (2002) argued that poverty is manifested not only in low per capita income, but also in the low human development indicators defining the welfare of its citizens.

### 5. Conclusion and Recommendations

Since the rate of increase in population is higher than food productivity then there is a need to revitalize the plan/strategies/programme and give a special focus on creating effective participation through encouraging full investment, especially farming business. Similarly, policies, strategies and programme developed, amended and implemented have to be realistic in portraying and exploring enormous opportunities that are in agriculture to ensure that growth of the economy is benefiting poor farmers as well as special attention is needed specifically on the government spending on agriculture investment, which should focus on providing short and long term solution; including encouraging agriculture investment and well communicated agricultural research between researcher-extension officer-farmers and should encourage feedback from farmers to researchers. There are indications that with appropriate investments in the context of public-private partnership, it is possible to achieve lower costs of production, given that infrastructures and public services are well available to the small scale farmers. It is expected that ongoing road infrastructure development will improve and reduce costs of transport, distribution and reduce unnecessary expenses, especially on post-harvest loss that make local produce uncompetitive versus imported products.

Agriculture plays an important role in the Tanzanian economy and has the potential to advance the country's goal of being middle income country in 2025, and sustaining growth while reducing poverty. Agriculture has big share of employment (62.8%), but majority are smallholder farmer mostly producing food for their families and surplus for sale. Since poverty is the phenomenon that is dominant in rural and agriculture is a major economic activity for rural population, therefore, to succeed in poverty reduction it is necessary to focus on improving performance of the agricultural productivity. So it is imperative that increasing in agricultural growth is not only to increase the incomes of farmers but also to support acceleration of development of non-agricultural activities in rural and urban areas, narrowing down inequality and improving lives of rural poor (poverty reduction). Steps must be taken now if the nation is to continue to pursue high level of achievement so that arable land with the favorable climate has to be strategically used for food production to ensure availability of supply of the food and bridge the gap of shortage of food today and in the future. This is a moral obligation of the nation that intends not only to change income of poor and their life style standard but also ensure sustainability of food availability, food access and food utilization within the nation and in the world at large. However, the role of agriculture during growth and structural transformation and the impact in economic development and poverty reduction has been and still a controversial issue since poverty is affected by high growth rate

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