



# UNIVERSITY OF GOTHENBURG

## SCHOOL OF BUSINESS, ECONOMICS AND LAW

Bridging the Gap between Economic Growth and Poverty Reduction: The case of Tanzania

Master's Thesis in Economics (30 hec)

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## **ABSTRACT**

Most of the developing countries have experienced impressive economic growth over two decades since 1990 with more than 50 percent poverty reduction whilst most of the Sub-Saharan African (SSA) countries are facing the challenge of little poverty reduction over this period, in which poverty on average has been reduced by 30 percent. Tanzania as part of SSA is facing the same, with poverty having declined by 31.6 percent from 1991 to 2018. This research has investigated Tanzanian economic growth, and how does such growth translates into monetary poverty reduction. To accomplish such a task, I have used data from National Panel Surveys. I employed panel data analysis to assess how large is the impact of growth and inequality on poverty. Also, I did other regression analyses to investigate the demographic and socioeconomic factors contributing to the movement of households from poverty. Based on the analysis, it shows that the increase of mean expenditure (GDP per capita) correlates with the reduction of monetary poverty. The findings have also revealed that some of the demographic and socioeconomic factors have shown positive contribution in the movement out of poverty among households.

**Key Words:** Tanzania, Monetary Poverty, Expenditure per Adult Equivalent, Expenditure Distribution, Poverty Line, Headcount Ratio, Gini Coefficients, Socioeconomic Factors, National Panel Survey.

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## 1. INTRODUCTION

The reduction of poverty and inequality is a major policy challenge to numerous developing countries, particularly in Sub-Saharan Africa (Kahn et al. 2019). As stipulated in the Sustainable Development Goals (SDGs 2030), such phenomenon is well addressed under the adherence of the principle of leaving no one behind, which essentially captures three concepts that are critical to improving the welfare of societies: ending extreme poverty (in all its forms), reducing inequalities, and addressing discriminatory barriers, which could arise from geographical locations or aspects of social identity.

Informed by Kraay (2006), a significant percentage of economies tend not to be pro-poor. That is because economic growth is neither equitable nor inclusive. In other words, poor people do not benefit from such economies (Ravallion & Chen 2003). According to Kakwani and Pernia (2000), economic growth qualifies as pro-poor when it has policies and programs that reduce inequalities and enable income generation and employment to the poor especially to the marginalized groups such as women, youths, people with disabilities and vulnerable people.

Drawing from Roemer and Gugerty (1997) one observes a notable challenge in the persistent extreme poverty. A population that faces such challenge is mostly in the rural areas, as well as among the socioeconomic groups such as women, youths, elderly people, children, and other marginalized individuals. Such a situation has prompted some to question the role of economic growth in reducing poverty. To address the challenge, both Bigsten et al. (2003) and Cheema and Sial (2010) have suggested that any policy that aims at reducing poverty must target both, ameliorating the income distribution and sustainable economic growth.

In the real situation, the poor people have much lower well-being than the non-poor because they cannot have access to meet their basic needs such as foods, shelter, clothes, health, education, safe water, the sustainable energy source for cooking and light and many more (Kakwani & Pernia 2000). Kakwani and Pernia (2000) elaborate that to promote pro-poor growth, governments or institutions are required to have a deliberate strategy that favors the poor people so that they could benefit more than the rich. By this kind of intervention, they

presume that the incidence of poverty would rapidly reduce and poor people can manage to meet their necessities.

Tanzania has been registering a remarkably high economic growth rate averaging 6-7 percent between 2005-2019 but with little trickledown effect on reducing poverty. Poverty and inequality reduction have remained one of the major developmental challenges to the government. This situation might be associated with unequal distribution of household consumption (Atkinson & Lugo 2010). The Household Budget Survey (HBS 2017/18) indicated that the poverty headcount ratio has decreased from 34.4% to 28.2% and from 28.2 % to 26.4% in the years 2006/07 to 2011/12 and 2011/12 to 2017/18 respectively, while inequality has increased from a Gini coefficient 0.35 in 2006/07 to 0.38 in 2017/18. This elucidates that, in 2017/18 about 14 million out of 53 million people lived below the national poverty line. According to World Bank about 26 million which is half of the Tanzanian population lived below the international poverty line of \$1.90 per person per day (in 2011 purchasing power parity). The situation is more alarming in the rural areas which indicated many Districts (rural areas) are worst with poverty incidence ranging from 50.2 to 62.8 percent. This statistical evidence portrays the critical challenge of slow pace in transforming growth into poverty reduction and human development, particularly in rural areas.

Additionally, the Household Survey data revealed high poverty incidence among the vulnerable and marginalized groups such as youths, women, children, people with disabilities and elderly people. Table 1 below illustrates different levels of poverty rates, inequality (Gini coefficients) and GDP per capita (at constant 2010 US\$) for the years 1991/92, 2000/01, 2006/07, 2011/12 and 2017/18.

**Table 1: Poverty Rates, Inequality and GDP Per Capita at National Level**

Year	1991/92	2000/01	2006/07	2011/12	2017/18
Poverty Rate (Headcount Ration)	38.6	35.7	34.4	28.2	26.4
Inequality (Gini Coefficient)	0.34	0.35	0.35	0.34	0.38
GDP Per capita (\$)	509	522	660	777	937

Source: HBS 2017/18 for Headcount ratios and Gini Coefficients and World Bank for GDP per Capita (at constant 2010 US\$)

Furthermore, Table 2 below indicates the percentage changes of these three variables for the same periods. Figure no. 1 has summarized the national economic growth and sector growths for the period of 2005-2019. This depicts that there was high growth in general, but in the agricultural sector, the growth was below the GDP growth rate.

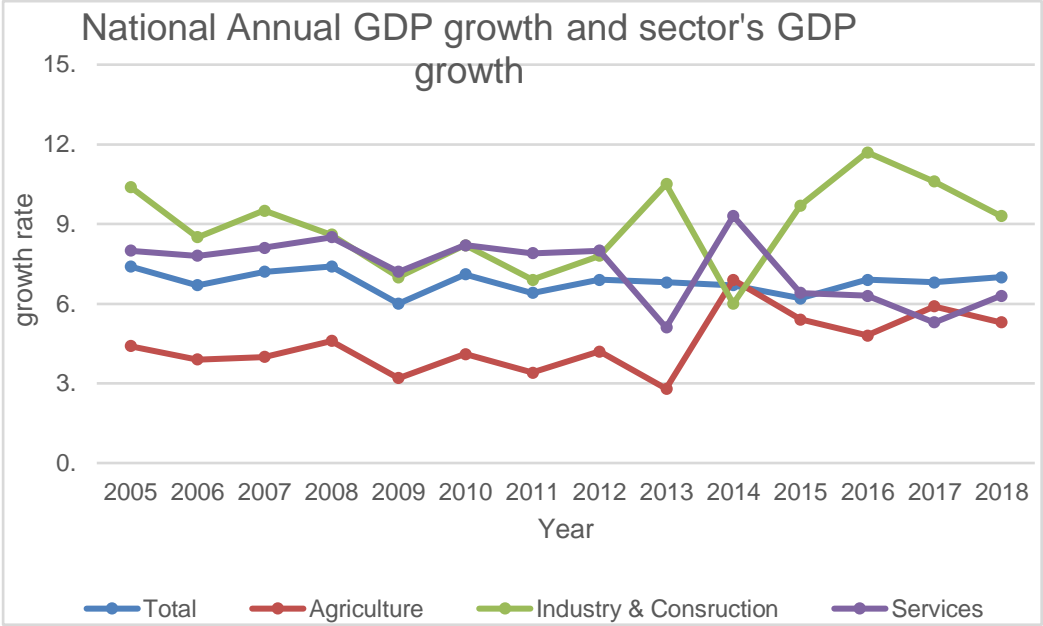
**Table 2: Percentage changes of poverty and GDP Per capita**

	1991-2000	2000-2006	2006-2011	2011-2017
Poverty	-7.51	-3.64	-18.02	-6.38
GDP per capita	2.55	26.44	17.73	20.59
Growth Elasticity of Poverty (GEP) <sup>1</sup>	2.95	0.14	1.02	0.31

GEP<sup>1</sup> is a (negative) ratio of percentage change of poverty to the percentage change of GDP per capita

Source: Author's Computation of data from HBS and World Bank.

Figure 1



Source: National Accounts of Tanzania

One of the reasons for the observed pattern is that most of the poor are employed in sectors with a small growth pace. In particular, agriculture which employs more than 65 percent of the employment with the majority of rural poor people, grows with an average rate below 5 percent per annum whilst services and industries sectors employing only 28 and 6 percent, respectively, growing at a rate higher than the GDP, ranging from 8 to 14 percent but with little engagement of the poor in their value chains (Economic Survey, 2018)

The government of Tanzania has tried to curb this growth-poverty nexus challenge for many recent years by implementing different strategies like the National Strategy for Growth and Reduction of Poverty (NSGRP I & II, 2005-2010, 2010-2015), the Five-Year Development Plans (FYDP I & II, 2010-2015, 2015-2020) as well as other national and sectoral policies and strategies, in the efforts to increase economic growth and reduce poverty of its people but little achievement has been recorded in reducing monetary poverty. However, there has been a gradual improvement in other poverty indicators such as in education and health. Currently, the government is embarking on the Third National Five-Year Development Plan (FYDP III 2021-2026) with the theme of Realising Economic Competitiveness and Industrialization for Human Development as one among the series of midterm plans to achieve the envisioned Tanzania



Development Vision (TDV 2025) with the major focus of attaining high-quality livelihood (including eliminating ultra-poverty) and a Middle-Income Country (MIC) status by 2025.

In the view of the phenomenon facing Tanzania and prior to my experience as a government employee in the department which deals with the coordination and monitoring of poverty reduction agenda in the country, I became motivated in studying this puzzle of the mismatch between the impressive economic growth and marginal poverty reduction. I, with my colleagues in the government, have been facing numerous questions from the Members of Parliament, Development Stakeholders, Non-Governmental Organizations and the general public regarding why poverty is not reduced at the higher rate as it was expected from observed high economic growth.

The main objective of this thesis is to investigate the relationship between economic growth, inequality and poverty reduction in Tanzania. More specifically, I will assess to what degree economic growth translates into poverty reduction, and what underlying factors can enable people to move out of poverty. In pursuit of the research objective, I will attempt to answer the following questions:

1. Does GDP per capita (mean expenditure) reduce poverty and at what size?
2. Does inequality (expenditure distribution) increase or decrease poverty and at what size?
3. What demographic and socioeconomic factors are associated with the households moving out of poverty?

Regarding the objective of the study and its questions, this study is of interest to many stakeholders within Tanzania including the government itself and even outside the country. It is my expectation, once this study is done thoroughly by answering the identified questions, it will facilitate to extend knowledge regarding the mechanism of translation of economic growth to poverty reduction and understanding the factors contributing to people moving out of poverty.

The paper is structured into six sections. The first section elaborates on the economic growth nature and poverty reduction status in Sub Saharan Africa and particularly in Tanzania, the efforts which the government has done and introduces the purpose of the study. The second section dwells on reviewing the previous researches related to the topic, their questions, data

and methodologies used as well as their conclusions. The third section describes the theory behind the topic and elaborates the theoretical relationship between GDP per capita, poverty reduction and inequality. The fourth and fifth section presents Data and Methodology and summarizes and discusses the results obtained. Lastly, the paper concludes the results obtained concerning the questions and provides some policy recommendations.

## 2. LITERATURE REVIEW

This section examines previous studies which explored similar topic related to the relationship between economic growth and poverty reduction. This review is done purposely to link their empirical evidence and evaluate them and build to my research questions, theory and methodology. This in a way builds in the previous knowledge and results and facilitates in filling the knowledge gap. The review focus on three areas: what questions did they investigate? Which approaches, and data did they use? Finally, what results did they reveal?

Informed by Kahn et al. (2019), one observes that economies in Sub-Saharan African countries have been growing with remarkable rates since 1990 with an average of 5-6 percent annually but with sluggish translation into poverty reduction, which has just reduced by an average of 30 percent (Devarajan 2013). This is not the case for other developing regions where poverty has been reduced by 50 percent or more (Kahn, Morrissey & Mosley, 2019). For instance, Kahn, Morrissey and Mosley (2019) revealed that between 1990 and 2012, the poverty headcount ratio dropped from 60 to 15 percent in East Asia, 50 to 25 percent in South Asia and 20 to 10 percent in Latin America, but for the case of SSA it only fell from 57 to 43 percent which is a 25 percent reduction. Their study estimated the growth elasticity of poverty, in two different SSA economies and concluded that poverty is reduced at higher rates when the economy is based on labor-intensive smallholder than when it is capital intensive extractive economies which depend on minerals and plantations. Their argument is to some extent similar to the case of Tanzania, whereby the sectors with higher growth rates are construction, industries and services while agriculture is left behind nevertheless it contributes about 28 percent to the GDP (Economic Survey, 2018). Also, Fosu (2010) reveals that poverty in SSA countries has not been reduced with a high rate as it was 46 percent in 2000 and reduced to 41 percent in 2004 as the proportion of the population living on less than 1 dollar per day.

A specific country study was done in Pakistan, which was trying to investigate the long-run correlation between growth, inequality and poverty (Cheema & Sial 2012). The study used the pooled data set from eight Household Income and Expenditure Surveys of different years and ran Panel Data Regression. The results revealed that economic growth contributes highly to reducing poverty when inequality is not increasing. Since at some stages, growth can increase inequality and poor people benefit not much as compared to the non-poor. In this view, the

issue of income distribution needs to be part of the poverty reduction strategies to attain the required poverty reduction from economic growth.

Another study by Adams (2003) included 50 low-income countries investigates the growth elasticity of poverty that is to what extent economic growth reduces poverty in those countries. The paper used Panel regression, employed by Ravallion & Chen (1997) with two main variables. Poverty was a dependent variable and mean expenditure (proxy to GDP per capita) was the main independent variable, both varying across time and country. The study concluded that economic growth is an important variable in reducing poverty in developing countries. The study added that there is a strong link between poverty and growth when growth is measured by the survey mean income (consumption) and less strong when mean growth is measured as GDP per capita in the national accounts. Another study by Adams (2004), also elucidates that the relationship of poverty and growth depends on the measure of growth. When growth is measured by the survey mean income (consumption), the growth elasticity of poverty was 2.79 which implies a 10% increase in the growth will reduce poverty by 27.9%. With the common measure of growth in terms of GDP, the growth elasticity of poverty is a statistically significant of 2.27 (Adams, 2003). This implies that a 10% increase in growth will reduce poverty by 22.7%.

Also, the paper by Bigsten et al. (2003) investigates the impact of growth on poverty in Ethiopia. The analysis uses panel data for the period 1994 to 1997. Results indicate that poverty reduction which was a result of an increase in income per capita was not sufficient due to the presence of inequality. The author concludes that there is a strong relationship between growth and inequality which reveals itself in an inverted U shape, that is, growth first increases with inequality and later it increases while the inequality decreases, the phenomenon which was tested across countries. This kind of relationship between growth and inequality was earlier elaborated in the Kuznets hypothesis in 1955 (Cheema & Sial 2012). This paper by Bigsten et al. (2003) elucidates that, there is a strong relationship between GDP per capita and poverty reduction and that it is inevitable for any policy aiming to reduce poverty should focus on rapid growth. However, they explain that the size of the effects of growth on poverty depends on the attributes of the growth process. The attributes of the growth are important elements since they elucidate where does the growth comes from; does it involve the poor majority? If this not the case, economic growth is not translating to a high rate of poverty reduction.

Furthermore, the study which was conducted in Tanzania by Arndt et al. (2016) was also looking at the same puzzle similar to my study on why Tanzania has not managed to translate its growth into a high reduction in monetary poverty. The authors have not done substantial empirical analysis but rather manipulated mathematically and obtained the Growth Elasticity of Poverty (GEP) using data from Household Surveys and National Accounts for the case of GDP. The results obtained, indicated that there is such a weak link between growth and poverty and that GEP was around 0.21 and 0.80 for the periods 2001-7 and 2007-12 respectively. These results elucidate that a 1 percent increase in GDP per capita can only reduce poverty by 0.21 and 0.8 in the said periods. This result of Tanzania GEP is very small compared to the developing countries which range between 1 percent and 5 percent and average to 3 percent. This is almost similar to another Tanzanian-based study by Mkenda et al. (2010) which investigates the conundrum of the impressive growth that neither reduces poverty nor increases inequality. They used GDP from national accounts and poverty rates from HBS between the years 2000 and 2007. They calculated the Growth Elasticity of Poverty and obtained the same results of 0.2. Mkenda and his colleagues went further in their study to determine factors that correlate to poverty reduction or moving out of poverty using cross-tabulation together with Logit Regressions and found that income, assets ownership, education of the head and social assistance received have a positive correlation to the reduction of poverty. The difference between my study and these two studies is, I use the panel data from National Panel Surveys to estimate the association of growth and poverty and factors determining moving out of poverty. The panel data enabled me to observe the same households' poverty status in different periods.

Agrawal (2008) investigates the relationship between economic growth and poverty alleviation for the specific country of Kazakhstan. This study employed an empirical approach of linear regression using poverty of different provinces and their GDP. The study concludes that poverty was reduced at a high pace from 39% in 1998 to 20% in 2004 due to high economic growth. The empirical evidence in the study shows a significant correlation between economic growth and poverty. Also, the paper by Roemer and Gugerty (1997) investigates the association between growth and poverty and found that a 10% increase in growth increases income by 10% of the 40% poorest decile and it increases income by 9.21% of the 20% poorest decile. This result supports the argument that GDP per capita is a major determinant in reducing poverty. These

results show strong evidence that high growth correlates to high poverty reduction which is contrary to the situation happening in Tanzania.

The kinds of literature reviewed indicate a mixed result on how large is the impact of growth on monetary poverty. Some of the studies have empirically shown evidence that growth leads to a significant reduction of poverty. Others have gone further by indicating a strong relationship between growth and poverty by showing Growth Elasticity of Poverty (GEP) like a 10% increase in growth can reduce poverty by 10%. The opposite results, particularly in Sub-Saharan African countries including Tanzania, reveal a slow reduction in poverty in the presence of high economic growth. In a nutshell, it seems from many previous works of literature, growth is an important tool in reducing poverty but not sufficient when a fast and large impact is desired (Ravallion 1994; Mullok et al. 2012). The attributes of growth and the level of inequality in reducing poverty have also been discussed in the literature.

Most of the studies on the same topic have just looked into how much growth is impacting monetary poverty either across countries or in a specific country by using the Household Survey data alone or in combination with GDP data from the National Accounts. One of the areas which have not got much attention is why some economic growths do not trickle down with a large impact on the micro reduction of poverty for instance in the case of Tanzania. My study is a bit different from the previous researches. Apart from estimating the association between GDP per capita, inequality and poverty, I will also investigate what demographic and socioeconomic factors contribute to households moving out of poverty and provides some of the policy recommendations.

### 3. THEORETICAL MODEL

This section elaborates on the theoretical relationship between economic growth, poverty and inequality. How growth translates into poverty reduction depends on whose income is growing, so how the income growth is distributed among the population.

Poverty reduction is of course related to economic growth and changes in inequality as mentioned earlier in previous studies. The extent to which economic growth translates into poverty reduction depends on contextual factors. Could be for instance levels of inequality or what sectors are growing. It is not even clear that economic growth will reduce poverty at all if the incomes of the poor do not grow. As informed by Ravallion and Chen (2003); Kakwani and Pernia (2000) the economic growth should increase the income of the poor to reduce poverty. Hence the extent to which economic growth reduces poverty, and whether it does so at all is an empirical question.

To address the main research question on assessing how large is the impact of economic growth on monetary poverty, we adopt the theoretical framework which represents the poverty change or reduction as a functional form comprising of economic growth and income distribution (inequality) (Agrawal 2008). This kind of relationship has been supported by many studies on a similar topic from different countries. According to the authors, Cheema & Sial (2012), poverty depends on economic growth and income distribution. Some studies, for example, Kaldor (1956); Li & Zou (1998); Forbes (2000) show that inequality leads to economic growth while others like, Alesina & Rodrick (1994), claim that inequality negatively impacts economic growth. Bigsten et al. (2003) elaborate that the association between growth and inequality is depicted in the form of an inverted U shape.

The model is expressed in the following form, whereby P is Poverty, y is mean income or mean expenditure and D is income distribution/ expenditure distribution (inequality).

$$P = P(y, D) \tag{1}$$

The change in poverty,  $\Delta P$  is explained by the change in mean expenditure, y, which I use as a proxy to GDP per capita, and the change in income distribution, D from time 0 to time t. This suggests that, whenever there is a change in mean expenditure or inequality or both, there should be a change in poverty.

$$\Delta P = P(Y_t, D_t) - P(Y_0, D_0) \quad (2)$$

From this model, the major change in poverty is expected from the change in economic growth since inequality in most of the countries does not change much over time and sometimes no change in a short time.

The production function model which is given as  $Y = A^u K^\alpha L^{1-\alpha}$  indicates what major factors contribute to the increase of the output (GDP); where Y is GDP, K is physical capital, L is human labor,  $\alpha$  is the parameter representing technology, A is an initial endowment of capability and u is the rate of evolution of technology. As have been explained by Ijaiya et al. (2011), increasing in technological capabilities will increase the GDP for any level of input K and L and therefore the increase of output due to technology can lead to the improvement of the standard of living and therefore reduce poverty as shown in model 2.

This theoretical model is the basis of the empirical model in which I will analyze and investigate the size impact of economic growth on poverty. The theory predicts that, if there is economic growth in terms of GDP per capita there will be a reduction in monetary poverty in terms of headcount ratios as well predicts the movement of people from being poor to become nonpoor.



## 4. DATA AND METHODOLOGY

This section entails elaborations on the issues of data and methodology as well the limitation and delimitations of the study.

### 4.1 Variables and Data

In this research, I will use two groups of data sets, one group will be based on regions and another group is based on households. The main variables of the study are the poverty rates, mean expenditure per adult equivalent as a proxy for GDP per capita and expenditure distribution (inequality) at the regional level. In the household-level analysis, I binary dependent variable "become non-poor" as dummy variable which is 1 when become non-poor and 0 when remaining poor (from a sample which they are all originally poor). Other explanatory variables will be the mean expenditure of the region, inequality of the region, demographic factors such as age, disability, sex and social characteristics like level of education of mother and father, source of water, type of fuel and social assistance.

To facilitate easy presentation and understanding, I will define only three key variables, i.e, Poverty, Expenditure per Adult Equivalent and Expenditure distribution. The variables which will be used in different models at the regional level are continuous but at the household level, there is a mixture of continuous and dummy variables.

#### 4.1.1 Definition of Key Variables

**Poverty:** can be defined in different ways but Roemer and Gugerty (1997) elaborate that poverty is measured mostly by headcount index by considering the number of people with income below a certain threshold. In Tanzania, the basic needs approach is used to measure absolute poverty which they define minimum resources in terms of goods to be consumed for personal wellbeing and this minimum resource is regarded as the poverty line and anybody who is below that income is regarded to be poor or basic needs poor (HBS 2017/18). In the Tanzania National Panel Surveys, they use poverty definition which is almost close to Household Budget Surveys. Firstly, it puts a certain threshold regarded as the poverty line in terms of monetary cost and if any person does not meet that amount that meets a minimum standard of living is considered as poor. In this approach, they establish the Headcount index as an official poverty measure in Tanzania.

**Expenditure per adult equivalent:** This is all the expenditures identified as necessary for human welfare like food, education, health, water, communication, transport and others but since in families there are people of different ages and there are differences in consumption between males and females so they put some weights in regards to age and sex. In that sense, the expenditure is calculated considering those weights and hence regarded as per adult equivalent.

**Expenditure Distribution:** is the variable that measures the inequality and thus covers the variabilities of expenditures among the households within the population. This inequality is measured between the scale of Gini 0 to 1. When the inequality is near to Gini 0 that means the expenditure is similarly allocated among the population and when is near to Gini 1 which is high inequality means that the expenditure is highly allocated in a relatively small group of the population (NPS, 2012)

#### **4.1.2 Data**

I will use the panel data for three consecutive waves of 2008/09, 2010/11 and 2012/13 of the Tanzania National Panel Surveys (NPS). The NPS is conducted nationally at the individual, household and community level in all regions of Tanzania (Mainland and Zanzibar). Since Tanzania is a union of two countries Mainland Tanzania and Zanzibar, the NPS does cover both Mainland Tanzania and Zanzibar. On that note, the analysis will touch upon all the regions of the United Republic of Tanzania.

This survey is a nationally representative household survey that collects varieties of information on household consumptions of food and non-food items, demographic issues such as gender, age, marital status and socioeconomic characteristics such as education, health, agriculture and off-farm activities. These surveys are conducted by the government of Tanzania under the management and coordination of the National Bureau of Statistics (NBS) in support of the Development Partners such as the World Bank, European Commission, the Bill and Melinda Gates Foundation, UNICEF, UNFPA and the Royal Danish Embassy at different waves and stages.

The first wave was conducted between October 2008 and September 2009, the second round was between October 2010 and September 2011 and the third wave was done from October

2012 to September 2013 so that the same households are revisited in the same periods of the year.

The main objective of the NPS in Tanzania is to track the national poverty reduction strategy, which, at that time was known as the National Strategy for Growth and Reduction of Poverty (NSGRP) and international development agenda by then Millennium Development Goals (MDGs). These datasets can provide the levels of poverty (basic needs poverty and food poverty) by Headcount ratio at the national level and as well as, disaggregated sets by rural, urban and Dar es Salaam (as the region with high population and most economic activities) for all the survey periods. Data are available for (the then) 26 regions, of which 21 regions are from Mainland Tanzania and 5 regions are of Zanzibar (both Unguja and Pemba islands). In this regard, my analysis will base on households and also aggregates the households within regions and do some regional estimates.

The NPS is well designed in terms of sampling which covers all districts and regions in both areas, Mainland Tanzania and Zanzibar. The sample size for 2008/09, 2010/11, 2012/13 were 3,280, 3,924 and 5,010 respectively. The sample size increased from wave one to wave two and three, due to the fact that some households were split. But the reality is 97 percent of Wave One was relocated in Wave Two and 96 percent of Wave Two were identified in Wave Three and re-interviewed to observe the outcomes. On this note, this is good panel data since it is a balanced panel. The key advantage of the NPS that differentiates it from other usual cross-sectional household surveys, is that it allows monitoring of poverty at the household level and follows the same households over time.

The sample sizes were calculated to be sufficient to produce national poverty estimates. The sampling population was used from the 2002 Population and Housing Census. The probability approach was used to select the sample based on the population size in each main stratum (Mainland and Zanzibar) and in each cluster (urban, rural and Dar es Salaam).

The data were collected through structured interviews operationalized by the questionnaires of individuals, households and communities. The interview was done in 12 months and every region and district were visited three times to account for all year variations

In this view, the dataset which I will use in my study seems to be relevant in terms of its means of sampling technique, data collection and also it responds well to the topic under study. The data from all the surveys have been customized, prepared and pooled together to be uniform to a large extent in terms of the variables of choices like poverty rate, mean expenditure, inequality and some other demographic and socioeconomic variables at the households level.

#### **4.1.2.1 Descriptive Statistics of Regional Level**

In the regions' data set based, there are 78 observations (26 regions in 3 waves). I prefer to report the Mean of the variables poverty rate, expenditure distribution, food poverty rate and food expenditure distribution just to give an overview of the situation of incidence of poverty and inequality across the three waves and regions.

The Mean gives an average value of the selected variables. For example, table 3 shows the average poverty rate is headcount ratio 13.83 and the minimum and maximum headcount ratios are 0.5 and 38 respectively, average expenditure distribution (inequality) is Gini coefficient 0.35, the food poverty rate is headcount ratio 6.79 and food expenditure distribution is Gini coefficient 0.324. Table 4 presents the averages of poverty rate, expenditure inequality, food poverty and food expenditure inequality for each wave. Generally, the figures indicate that from Wave One to Wave Two and Three, all the indicators have increased although the inequality has not increased by a large margin. This can facilitate the comparison between the three different waves and as it is seen poverty rate has increased from Headcount ratio 7.6 to 11.36 and 13.61 in Wave 1, Wave 2 and Wave 3 respectively. Also, inequality has increased from Gini coefficients 0.345 to 0.349 and 0.355 in Wave 1, Wave 2 and Wave 3 respectively.

Tables 5 shows mean poverty incidences for each region in each wave. The figures show that Kigoma region is the poorest with a basic need poverty rate of headcount ratio 30.6, 37.7 and 30.0, whilst Dar es Salaam is the least poor with a poverty rate of headcount ratio 0.66, 1.46 and 1.55 in Wave One, Two and Three, respectively.

The missing values in the dataset have been checked and rectified, and therefore the data used for the analysis have no missing data. Missing values in practice can be caused by many issues such as an error in recording the data, or not able to get some data of other variables for various

reasons. The implication of missing values is to cause biases in the results and therefore results become not robust.

Table 8 shows the correlation between the variables of interest such as poverty rate, inequality, food poverty and mean expenditure, which are in natural logarithms. They do not indicate perfect multicollinearity, since the correlation between them lies between 1 and -1, in that case, they can be used to estimate the models.

*Table 3: Mean Statistics for all three waves*

Variable	Observations	Mean	Std. Dev.	Min	Max
Poverty rate	78	13.831	8.5	.541	37.692
Inequality	78	.35	.043	.216	.434
Food poverty rate	78	6.79	5.171	.18	23.077
Food inequality	78	.324	.043	.201	.424

*Table 4: Mean statistics for each wave*

	Variable	Number of Regions	Mean	Std. Dev.
<b>Wave 1</b>	Poverty rate	26	7.614	5.866
	Inequality	26	.345	.046
	Food poverty rate	26	7.414	4.99
	Food inequality	26	.32	.043
<b>Wave 2</b>	Poverty rate	26	11.355	7.712
	Inequality	26	.349	.038
	Food poverty rate	26	11.644	7.733
	Food inequality	26	.323	.039
<b>Wave 3</b>	Poverty rate	26	13.609	7.592
	Inequality	26	.355	.047
	Food poverty rate	26	13.917	7.271
	Food inequality	26	.33	.047

*Table 5: Regional Poverty Rates for all the Waves*

Region	Wave One		Wave Two		Wave Three	
	Mean	SD	Mean	SD	Mean	SD
ARUSHA	2.24	14.85	5.22	22.33	12.31	32.98
<b>DAR ES SALAAM</b>	<b>0.66</b>	<b>8.11</b>	<b>1.46</b>	<b>12</b>	<b>1.55</b>	<b>12.37</b>
DODOMA	9.76	29.79	31.71	46.72	34.17	47.63
IRINGA	5.03	21.93	8.81	28.43	11.54	32.05
KASKAZINI PEMBA	25.71	43.92	18.1	38.68	18.27	38.83
KASKAZINI UNGUJA	15.73	36.61	11.24	31.76	22.09	41.73
KUSINI PEMBA	11.3	31.8	4.35	20.48	10.62	30.95
KUSINI UNGUJA	6.82	25.5	4.55	21.07	2.33	15.25
KAGERA	5.19	22.23	8.49	27.94	18.84	39.2
<b>KIGOMA</b>	<b>30.6</b>	<b>46.21</b>	<b>37.7</b>	<b>48.6</b>	<b>30</b>	<b>45.95</b>
KILIMANJARO	5.41	22.69	8.78	28.4	10.42	30.65
LINDI	15.86	36.61	14.1	34.88	20.18	40.22
MJINI MAGHARIBI UNGUJA	7.22	25.93	4.33	20.39	3.11	17.4
MANYARA	14.04	34.89	19.3	39.64	20.72	40.71
MARA	10.87	31.3	27.17	44.73	21.11	41.04
MBEYA	6.4	24.54	14.29	35.08	14.65	35.45
MOROGORO	9.2	29	8.59	28.11	9.32	29.16

MTWARA	9.12	28.83	15.5	36.25	16.46	37.14
MWANZA	12.46	33.08	21.31	41.02	17.39	37.97
PWANI	3.74	19.06	2.8	16.59	6.8	25.29
RUKWA	12.61	33.35	19.82	40.05	25.23	43.64
RUVUMA	15.38	36.17	24.62	43.19	23.96	42.79
SHINYANGA	5.59	23.02	18.18	38.64	15.96	36.69
SINGIDA	15.12	36.03	16.28	37.13	22.35	41.91
TABORA	10.7	30.98	23.26	42.34	25	43.4
TANGA	2.38	15.29	14.29	35.1	12.57	33.26

**Table 6: Correlation analysis of the variables used in the models**

Variables	(1)	(2)	(3)
(1) log of poverty rate	1.000		
(2) log of mean expenditure	-0.428	1.000	
(3) log of inequality	0.165	0.221	1.000

#### 4.1.2.2 Descriptive Statistics of Household Level

The household data set have 442 households which were originally poor and 4,504 households which were originally non-poor. The sample is selected by sorting from the wave 1. In this group also, I will report on the variables on how many households have moved from poverty (become non-poor), how many have moved into poverty (become poor), how many have maintained the status quo (either remained poor or remained non-poor). Also, I will report on the mean



education levels of father and mother, marital status, disability conditions, social assistance, main water source and fuel used for cooking.

In the households' datasets, there will be four scenarios of the households. All households are initially poor in Wave One (W1) and I observe the trend of moving out of poverty or remaining in poverty status in the next waves (Wave Two-W2 and Wave Three-W3). In this trend there are four scenarios or possibilities, households can move from being poor in Wave One and become non-poor in both Wave Two and Wave Three (W1 to W2 & W3), or become non poor in Wave Two or Wave Three (W1 to W2 or W3), or become non poor in Wave Two (W1 to W2) and last scenario is households becoming non-poor in Wave Three (W1 to W3).

Table 7 is the summary of the four scenarios of the poor and non-poor households which show how many households have moved into non-poverty and into poverty. This indicates the absolute number that shows poor people have increased over time since less number become non poor but majority become poor in the next waves.

Table 8 indicates the demographic and socioeconomic factors for the two groups (originally poor and originally non-poor households). For the issue of education level of father and mother in the poor households' sample, it showed 71 and 87 percent of father and mother respectively did not go to school at all, whilst in the non-poor households' sample, 51.5 and 67 percent of father and mother did not go to school. This indicates that, in the non-poor households their parents are more educated especially fathers whom in most African countries and in particular Tanzania are the household heads. Also, about 8 and 2 percent of father and mother respectively in the poor households only completed primary education whilst the non-poor households are more than 15 percent for both parents.

Also, about 95 percent of the poor people use firewood for cooking while 71 percent of the non-poor households use the same energy for cooking. Furthermore, only 3 percent of the poor households have access to piped water while 10 percent of the non-poor households have access to piped water. On top of these, the poor households have bigger household size of 7 people while the non-poor households have household size of 5 people. This indicates that, most of the poor people live in larger families than the non-poor.

*Table 7: Comparison between households moving out of poverty and into poverty*

Scenarios	Become Non-Poor (Originally Poor Households)	Become Poor (Originally Non-Poor Households)	Change
W1 to W2 and W3	177	171	Poor households decreased by 6
W1 to W2 or W3	364	872	Poor households increased by 508
W1 to W2	263	491	Poor households increased by 228
W1 to W3	278	552	Poor households increased by 274

*Table 8: Summary of socioeconomic factors for poor and non-poor households*

**Non-Poor Households**

Variable	N	Mean	Std. Dev	Min	Max
Inequality	4504	.359	.038	.216	.434
Mean Expenditure	4504	776631.7	700934.8	233411.73	15201328
Age	4503	47.122	15.238	18	102
Household Size	4504	5.594	3.39	1	46

**Poor Households**

Variable	N	Mean	Std. Dev	Min	Max
Inequality	442	.349	.041	.216	.434
Mean Expenditure	442	184509.42	37627.491	46598.02	232349.89
Age	442	49.206	15.624	19	97
Household Size	442	7.17	3.542	1	26

### Poor Households

Main Source of drinking water	Frequency.	Percent
traditional source (rain, river, lake, pond, well without pump)	265	59.95
modern source (piped, water vendor, well with pump)	177	40.05
Total	442	100.00

### Poor Households

Type of fuel	Frequency.	Percent
Firewood user	424	95.93
Non firewood user (gas, charcoal, paraffin)	18	4.07
Total	442	100.00

### Poor Households

People with Disability	Frequency.	Percent
Yes	33	7.64
No	399	92.36
Total	432	100.00

### Poor Households

Father's education level	Frequency.	Percent
Did not go to School	305	71.43
Did not finish Primary School	40	9.37
Finished Primary School	37	8.67
Did not finish Secondary School	2	0.47
Don't know	43	10.07
Total	427	100.00

**Poor Households**

<b>Mother's education level</b>	<b>Frequency.</b>	<b>Percent</b>
Did not go to School	369	87.23
Did not finish Primary School	21	4.96
Finished Primary School	7	1.65
Did not finish Secondary School	1	0.24
Don't know	25	5.91
Total	423	100.00

**Poor Households**

<b>Households received assistance</b>	<b>Frequency.</b>	<b>Percent</b>
Yes	16	3.62
No	426	96.38
Total	442	100.00

## 4.2 Methodology

This section presents the empirical methodologies which will be used to investigate the questions pointed out under this study. Under methodology, two groups of methodologies will be used, one using the regions dataset and the other on households' datasets. For the regions, I will use regression with panel data techniques (Fixed Effect Model). This technique is relevant to check the relationship between poverty and the two variables which are mean expenditure and expenditure inequality since there are many differences between rural and urban and among regions and differences in terms of years of the waves. This empirical method has also been employed in the study of (Cheema & Sial 2010, 2012). The main advantage of employing the Fixed Effect Model, is that, it removes the bias caused by omitted time constant variables, since it measures changes of all the samples across time. The main cons of using Fixed Effect Model are that it cannot estimate coefficients for variables which do not change over time such as gender. On top of the Fixed Effect Model, I also use the Clustered Standard Error, since the sample is small and might not be highly randomly selected so that the results become robust by making the variance of the error terms homoscedastic. I do not opt to employ the Ordinary Least Square (OLS) regressions to look for these correlations, since there are variations of these variables across regions and time variant as well. Applying OLS can cause problems such as biased results due to model specification errors.

In this methodology, I do not claim for causality rather the correlation between the regressors and the dependent variable. This is due to the fact that the assumption of exogeneity of the regressors is hard to verify and can be violated due to the endogeneity problem. The endogeneity problem is common in most of the empirical studies and is caused by different reasons such as omitting variables which have influence on the regressors as well the regressand, measurement error of the data is also among the reason for having endogeneity and as well the simultaneity which refers that regressor causes the dependent and dependent causes the regressor.

After running the panel regression analysis, using the regions-based data as stipulated, the results would be interpreted in two main angles. One could be that the coefficient of the average expenditure is significantly negative which means that economic growth does reduce poverty at the significant rate which means the growth causes impact on poverty reduction. Also, the size

of the coefficient would be looked at to identify the size of the impact. The coefficient is growth elasticity of poverty (GEP), which explains an increase of a 1% growth can decrease a value of poverty equal to that coefficient and if it is higher than the average rate of the GEP of the developing countries which is 3 (Arndt et al. 2016), then one can conclude that, mean expenditure is reducing poverty at high rate. Otherwise, the GEP can just be near or smaller than that of the developing countries which means the growth does not have large impact on poverty reduction. The interpretation for the inequality can be opposite to the growth since many studies show that inequality increases the poverty rate (Adams, 2003).

The model specification, to assess the size of the effect of growth and income inequality on poverty is shown in equation 3. In this model, I look for the association of each independent variable while controlling for the other. That means, I intend to look the specific effect without the influence of the other. In the model specification, I use the logarithmic forms in all the variables (dependent and explanatory variables), in this sense, the coefficient will be the elasticity, either Growth Elasticity of Poverty for the case of coefficient of Mean expenditure or Inequality Elasticity of Poverty for that coefficient of Inequality.

$$\ln(\text{Poverty}_{it}) = \beta_0 + \beta_1 \ln(\text{Mean Expenditure}_{it}) + \beta_2 \ln(\text{Inequality}) + u_i + \gamma_t + \epsilon_{it} \quad (3)$$

$i = 1, 2, 3..N$  refers to the cross-section of the regions;  $t = 1, \dots, T$  refers to the number of survey years (wave number, 1, 2 and 3);  $\text{Poverty}_{it}$  refers to the Headcount ratio in the region  $i$  in year  $t$ ;  $\text{Mean Expenditure}_{it}$  denotes the average expenditure (proxy to GDP per capita) of region  $i$  in year  $t$ ;  $u_i$  denotes area fixed effects;  $\gamma_t$  is a time-specific factor and  $\epsilon_{it}$  is an error term. This is due to the fact that there can be some unobserved factors related to area or time.

In the other models below (Model 4 and 5), I want to assess the size of the effect of growth on poverty and income inequality on poverty without controlling for the other, which means, this effect is influenced by the other omitted variable. This explains the influence of inequality on growth and vice versa.

$$\ln(\text{Poverty}_{it}) = \beta_0 + \beta_1 \ln(\text{Mean Expenditure}_{it}) + u_i + \gamma_t + \epsilon_{it} \quad (4)$$

$$\ln(\text{Poverty}_{it}) = \beta_0 + \beta_1 \ln(\text{Inequality}_{it}) + u_i + \gamma_t + \epsilon_{it} \quad (5)$$

In the case of households-based datasets, there will be two samples, both extracted from Wave One (W1). The samples are the households that were initially all poor and another sample that was initially non-poor. For this case, I decided to use the sample which is initially poor since it is of more interest to see how they move from poverty. The dependent variable abbreviated as TP (Transitory Poverty) is a dummy, which becomes non-poor (1) and those remaining poor (0) for the originally poor households' sample. The explanatory variables will be the mean expenditure per adult equivalent and expenditure distribution both at regional level, father and mother level of education, age of head, sex of head, disability of head, main water source, the major fuel for cooking, the main source of electricity and social assistance. The model specification aims to investigate and analyze the main question 3 of my study which asks about the demographic and socioeconomic factors that lead to households moving out of poverty.

In this analysis, since the dependent variables are dummy, I will employ the Logit model then for easy interpretation I will apply the Marginal Effects and if the coefficient of a variable is significant, that means it is associated with the expected probability of movement of households (individuals) to become non-poor. The changes to become non-poor is associated with the next waves.

$$TP_i = \beta_0 + \beta_1 \ln(\text{Mean Expenditure}_i) + \beta_2 \ln(\text{Inequality}_{it}) + \beta_3(\text{fathereduc}_i) + \beta_4(\text{mothereduc}_i) + \beta_5(\text{sex}_i) + \beta_6(\text{age}_i) + \beta_7 \ln(\text{disability}_i) + \beta_8(\text{water}_i) + \beta_9(\text{fuel}_i) + \beta_{10}(\text{assistance}_i) + \epsilon_i \quad (6)$$

### 4.3 Delimitations and Limitations

The scope of the study is only country-specific and not for comparability across countries. Tanzania being the focus of the project, I understand that, in the modern world, Development Economists view poverty as a multidimensional phenomenon with different measures but this study will only investigate the consumption poverty measured in headcount ratios.

The data employed in the study seems to be relevant to the research question and theoretical model. The limitation somewhat arises from the use of average expenditure or consumption as a proxy to GDP per capita, since GDP per capita showed a less strong link to the poverty reduction

than the mean expenditure (Ravallion & Chen 1997); (Adams 2003). On this note, using the mean expenditures might overestimate the results.

Regarding the sample size and point of analysis, it is mostly that, surveys disaggregate data nationally, urban, rural and Dar es Salaam. There are limited samples in the levels of regions. This in a way limits some of the analysis to the sub-national levels, such as districts and wards. The sample size was limited to produce reliable information at the region, notwithstanding I tried my level best to aggregate the household within each region and obtain the regional estimates.

Lastly, there are important methodological differences that make any direct comparison of poverty rates across the two major poverty surveys done in Tanzania which are HBS and NPS, potentially misleading, for instance, NPS does ask households about their consumption for the previous 7 days (recall approach) but HBS keep a diary for 30 days consumption. My analysis uses the dataset from NPS and hence the results are not comparable to HBS results, which in Tanzania, HBS provides the official poverty statistics.



## **5. RESULTS AND ANALYSIS**

This section presents the results obtained from different model specifications highlighted under the previous section on Methodology. The results will be interpreted and analyzed in detail in association with the research questions and the theoretical model.

### **5.1 Research Question One**

Research question one which states, "Does GDP per capita (mean expenditure) reduce poverty and at what size?" was investigated using model 3. The model estimates the correlation between Poverty Rate, Mean Expenditure (GDP per capita) and Inequality.

The results in table 9, indicates that there is a negative association between the Mean Expenditure and Poverty, which means that, growth does reduce poverty at a significant level of 1 percent. The coefficient of the Mean Expenditure is 0.7 which means the increase in 1 percent of the Mean Expenditure is associated with the decrease of the Poverty Rate by 0.7 percent. This Growth Elasticity of Poverty is smaller than the other developing countries as witnessed by other studies such as a study which was done by Adams (2003) which included 50 low-income countries which used both the GDP from National Accounts and mean expenditure from surveys and showed GEP of 2.27 and 2.79 respectively. The value of GEP for the developing countries as elucidated by Arndt et al. (2016), is ranging between 1 and 5 and on average is 3. So, the result I obtained is smaller than that of the developing countries.

### **5.2 Research Question Two**

Research question two which states, 'Does inequality (Expenditure Distribution) increase or decrease Poverty and at what size?' was investigated using model 3 as well. The model estimates the correlation between Poverty, Mean Expenditure and Expenditure Distribution (Inequality).

The results in table 9, show that the coefficient of Inequality is not significant. However, its sign is positive, which somehow indicates it increases poverty. But as I have shown in my descriptive statistics, Inequality is almost similar over time since its change is very minor so it might be the case that it does not influence the increase or decrease the poverty as for the case of this data.

On top of the results regarding questions one and two as shown by model 3, I also ran models 4 and 5. Model 4, which only uses the Mean Expenditure as the explanatory variable, the inequality is not included. The results show the effect of growth on poverty is almost the same 0.7 which indicates less influence of inequality on Mean Expenditure. A similar result that inequality does not change over time was obtained by Mkenda et al.(2010) using the Household Budget Survey data sets of 2000 and 2007.

In model 5, which only uses inequality as the explanatory variable, the mean expenditure is not included. The inequality is again not significant. But the results in model 5 do suggest that economic growth has increased inequalities, which means it has probably not reduced poverty as much as it could have.

**Table 9: The overall results for models 3, 4 and 5**

VARIABLES	Model 3	Model 4	Model 5
Log of Mean Expenditure	-0.660*** (0.195)	-0.693*** (0.190)	
Log of Inequality	0.567 (0.626)		1.079 (0.774)
Constant	-5.970* (2.912)	-7.016** (2.574)	3.516*** (0.819)
Observations	78	78	78
R-squared	0.172	0.164	0.030
Number of regions	26	26	26

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 5.2 Research Question Three

Research question three which states, 'What demographic and socioeconomic factors are associated to the households moving out of poverty?' was investigated using model 6. The model estimates the correlation between Becoming Non-Poor and the Explanatory variables such as Mean Expenditure, Expenditure Distribution (Inequality) and demographic and socioeconomic factors. The results are depicted in table 10 with the four scenarios.

The Mean Expenditure and Inequality show a positive correlation to the movement of the household out of poverty. In the scenario W1 to W2 or W3, when there is a unit increase in Mean Expenditure and Inequality, there is an increase in the likelihood of 0.162 and 0.290 for both Mean Expenditure and Inequality respectively of the households to become nonpoor. This correlation is at a 10 percent significant level. Also, a unit increase in Mean Expenditure shows an increase in the likelihood of 0.174 the household becoming nonpoor at a 10 percent significant level in the scenario W1 to W3. These results of Mean Expenditure and Inequality being positively correlated to the movement of the household out of poverty means that whenever the expenditure or income at the level of region increases there is a chance for them being part and parcel of the expenditure through different channels and therefore the chance for them to cross the poverty line and become nonpoor increases. Regarding the inequality being positively correlated to the movement of the household out of poverty, might seem somewhat strange but it is not. This means among the poor households' sample, a certain group has more income or more expenditure share than the others, so it becomes easier for them to move out of poverty and leave the other with less income in poverty.

Being not handicapped in scenario (W1 to W2 and W3) increases the expected probability of the households becoming nonpoor by 0.204. This margin is significant at 10 percent. Most of the disabled people are among the vulnerable groups which they easily fall into poverty and are unable to move out.

Furthermore, using a modern source of fuel like gas or paraffin increases the chances of households becoming nonpoor by 0.24 and by 0.22 in the scenario W1 to W2 and W3 and scenario W1 to W2 respectively and both at 10 percent significant level. This means, using modern sources of fuel is associated with high-income families and therefore they can move out of the poverty line and become nonpoor.

The Father and Mother education seem to be not significant and therefore do not have any association with the movement of people out of poverty. This might be the case because the sample involves only the poor households which parents have no formal education at all or very few with primary education which could not count as a good level of education to facilitate the movement out of poverty.

Also, social assistance is not significant in all the scenarios. This might be the case since very few poor households received the assistance. It is 16 households out of 442 households managed to get the assistance. The assistance was not provided to the majority number of poor, only 4 percent got it and those few might have some other challenges like inappropriate utilization of the assistance or be extremely poor or the assistance was little to bring changes.

Some of the demographic factors also showed a correlation to the movement of households out of poverty. Being male has indicated a positive correlation of moving out of poverty. There is an increase of 0.078 likelihood of moving out of poverty if the head of the household is a male than when the head is a female. This elucidates the real situation happening in the poorest families whereby, most of the female-headed households are poorer. Also, the households headed by more aged people seem to have more likelihood of moving out of poverty than the ones headed by younger heads. This might be the case since in real situations happening in rural areas, most of the old people own the bigger farms and livestock as compared to the young ones.

In the appendix, I also estimate regressions for the transition into poverty, using a similar approach and same explanatory variables as in Model 6 to investigate the demographic and socioeconomic factors which are associated with the households moving into poverty for the households initially nonpoor in Wave One. The results are almost vice versa to what I got in Model 6 for the initially poor households. For instance, a unit increase in mean expenditure decreases the likelihood to move into poverty; the increase in a unit of inequality has shown to increase the chance of some of the non-poor households falling back into poverty, this is the case simply because resources are skewed among the non-poor to few people; using the modern source of fuel like gas or paraffin decreases the chances of households moving into poverty; Being not handicapped decreases expected probability of the households to become poor; the households headed by more aged people seem to have less likelihood of moving into poverty.

Surprisingly, the gender coefficient is also positive as it was in the poor households, meaning being a male head, the chance of moving to poverty increases. I do not have a very clear explanation for this, but in the sample, the males are 76 percent, maybe this could be the reason because the males have a bigger probability of entering into poverty.

**Table 10: Model 6 Logit Regressions for the Poor Households and Marginal Effects**

Transition out of poverty (Wave 1 to Wave 2 and Wave 3)

variable	dy/dx	Std. Error	z	P>z	[ 95% C.I ]	X
Log of Mean Expenditure	0.163	0.108	1.510	0.130	-0.048 0.374	12.098
Log of Inequality	0.086	0.215	0.400	0.688	-0.335 0.508	-1.059
<b>Disability</b>	0.204	0.098	2.090	0.037	0.013 0.396	1.921
Sex	-0.082	0.057	-1.420	0.154	-0.194 0.031	1.284
<b>Age</b>	0.005	0.002	3.130	0.002	0.002 0.008	49.673
Water Source	0.045	0.054	0.820	0.413	-0.062 0.151	0.391
<b>Fuel Type</b>	0.240	0.106	2.250	0.024	0.031 0.448	0.043
Father's Education	0.002	0.015	0.160	0.870	-0.027 0.032	1.888
Mother's Education	-0.004	0.017	-0.260	0.796	-0.038 0.029	1.449
Assistance	-0.127	0.134	-0.950	0.343	-0.390 0.135	1.962

Transition out of poverty (Wave 1 to Wave 2 or Wave 3)

variable	dy/dx	Std. Error	z	P>z	[ 95% C.I ]	X
<b>Log of Mean Expenditure</b>	0.162	0.066	2.440	0.015	0.032 0.292	12.098
<b>Log of Inequality</b>	0.290	0.145	1.990	0.046	0.005 0.575	-1.059
Disability	0.030	0.061	0.490	0.625	-0.090 0.150	1.921
<b>Sex</b>	0.078	0.040	1.940	0.053	-0.001 0.158	1.284
Age	0.002	0.001	1.360	0.173	-0.001 0.004	49.673
Water Source	0.011	0.039	0.290	0.771	-0.065 0.087	0.391
Fuel Type	0.093	0.063	1.460	0.143	-0.031 0.217	0.043
Father's Education	0.018	0.013	1.420	0.155	-0.007 0.044	1.888
Mother's Education	-0.012	0.013	-0.880	0.379	-0.037 0.014	1.449
Assistance	-0.001	0.099	-0.010	0.994	-0.195 0.193	1.962

Transition out of poverty (Wave 1 to Wave 2)

variable	dy/dx	Std. Error	z	P>z	[ 95% C.I ]		X
Log of Mean Expenditure	0.174	0.109	1.600	0.110	-0.039	0.387	12.098
Log of Inequality	0.104	0.212	0.490	0.624	-0.312	0.520	-1.059
Disability	0.097	0.091	1.060	0.288	-0.082	0.276	1.921
Sex	0.023	0.055	0.430	0.668	-0.084	0.131	1.284
Age	0.003	0.002	1.550	0.121	-0.001	0.006	49.673
Water Source	0.020	0.054	0.370	0.708	-0.085	0.126	0.391
<b>Fuel Type</b>	0.222	0.095	2.350	0.019	0.037	0.408	0.043
Father's Education	0.004	0.015	0.290	0.773	-0.026	0.035	1.888
Mother's Education	0.023	0.021	1.080	0.278	-0.019	0.065	1.449
Assistance	-0.163	0.146	-1.120	0.264	-0.448	0.123	1.962

Transition out of poverty (Wave 1 to Wave 3)

variable	dy/dx	Std. Error	z	P>z	[ 95% C.I ]		X
<b>Log of Mean Expenditure</b>	0.174	0.097	1.790	0.074	-0.017	0.365	12.098
Log of Inequality	0.311	0.217	1.430	0.152	-0.115	0.738	-1.059
Disability	0.122	0.090	1.350	0.176	-0.054	0.298	1.921
Sex	-0.029	0.054	-0.540	0.588	-0.135	0.077	1.284
<b>Age</b>	0.005	0.002	2.830	0.005	0.001	0.008	49.673
Water Source	0.039	0.053	0.730	0.464	-0.065	0.142	0.391
Fuel Type	0.113	0.107	1.050	0.293	-0.097	0.323	0.043
Father's Education	0.017	0.015	1.160	0.246	-0.012	0.047	1.888
Mother's Education	-0.037	0.018	-2.060	0.039	-0.071	-0.002	1.449
Assistance	0.023	0.123	0.190	0.849	-0.217	0.263	1.962

## 6. CONCLUSION AND RECOMMENDATIONS

In responding to the research questions, the results showed that mean expenditure does reduce poverty in Tanzania. The size of the impact of growth (mean expenditure), in terms of GDP, is 0.7 which is smaller than that of the average of 3 of the developing countries. This indicates that the growth in Tanzania does not reduce poverty at a higher rate in comparison to other developing countries which is real a challenge facing the country. Also, inequality has shown no effect on poverty reduction, this is case may be due to the fact explained in the theory that inequality in some countries is not changing over time or it slightly changing.

The mean expenditure as shown in our results is associated with the very small change in poverty. This means that most of the households on average have little expenditure or little income which relates to the small change in poverty. The fact on the ground is that most of the poor are employed in sectors with a small growth pace. In particular, the majority of the poor are employed in agriculture, which grows, on average, at a rate below 5% per annum. The income obtained by most of the people employed in agriculture is very minimal and hence they are working poor. Looking into the economic structure of Tanzania, construction, mining and services such as transport, information and communication sectors grow at a rate higher than the GDP, ranging from 8% to 14% but with little engagement of the poor in their value chains. The major sector of agriculture employs about 65% of the population whilst services and industry sectors employ 28% and 6%, respectively (Economic Survey, 2018). Further, the fastest-growing sub-sectors each employ, on average, less than 3 percent of the active population, the majority with secondary education and above (60% on average). In order to see the high poverty reduction with this agriculture-poverty nexus, the government should revolutionize the whole sector of agriculture and make it a profitable business so that people working in it which are the majority poor in rural areas can benefit out of it and improve their economic and social wellbeing. Otherwise, the government should create more opportunities for non-farm activities for the poor people to get their additional income as non-farm income (Mkenda et al. 2010).

Furthermore, the government should have some interventions to alleviate poverty among the poorest groups such as people with disabilities and women. It has been shown in the study that being female and a person with a disability increases the chance of remaining poor. On top of



this, the government should improve some of the social services like the availability of a reliable source of fuel like gas, electricity and paraffin so that people get rid of traditional cooking fuel from cutting trees which to a large extent has a very negative impact to the environment and hence increases poverty. Also, social assistance is key for poverty reduction but my results did not show that it decreases the chance to become poor but, in the appendix, it shows once provided it reduces the chances for the households to fall back into poverty. This is the case because of the problem of targeting social assistance provision. About 107 nonpoor households received assistance while only 16 poor households got it. So, the government should improve the targeting by only considering the poor households so that they can easily move out of poverty.

Regarding the issue of education level, more than 80 and 90 percent of fathers and mothers respectively of the poor households did not go to school or did not finish primary education. This is more likely their poverty trap is associated with their low level of education since many studies suggest that earning increases with the level of education. The government of Tanzania should keep on focus on free basic education (primary to secondary) and improving technical and university level education as well in the area of Research and Development (FYDP III 2021-2026).

Lastly, since it was out of the scope of my study and also due to data limitation, I see an important area to undertake further study on the role of sector growth on household movement out of poverty. This area is key because it will precisely give a clear picture of what sectors the government should focus more on to reduce the poverty of its people.

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Appendix: Logit Regressions for the Non-Poor Households and Marginal Effects  
 Transition into poverty (Wave 1 to Wave 2 and Wave 3)

variable	dy/dx	Std. Error	z	P>z	[ 95% C.I ]		X
<b>Log of Mean Expenditure</b>	-0.034	0.004	-7.660	0.000	-0.043	-0.026	13.335
Log of Inequality	0.012	0.013	0.930	0.352	-0.013	0.037	-1.035
Disability	-0.004	0.006	-0.700	0.487	-0.015	0.007	1.934
Sex	0.001	0.003	0.350	0.723	-0.006	0.008	1.245
<b>Age</b>	-0.000	0.000	-0.560	0.575	-0.000	0.000	47.373
Water Source	-0.003	0.003	-0.970	0.330	-0.010	0.003	0.550
<b>Fuel Type</b>	-0.013	0.005	-2.380	0.017	-0.024	-0.002	0.297
Father's Education	-0.000	0.001	-0.180	0.860	-0.003	0.002	2.289
Mother's Education	0.000	0.001	0.280	0.781	-0.002	0.003	1.864
<b>Assistance</b>	-0.014	0.007	-2.070	0.039	-0.027	-0.001	1.977

Transition into poverty (Wave 1 to Wave 2 or Wave 3)

variable	dy/dx	Std. Error	z	P>z	[ 95% C.I ]		X
<b>Log of Mean Expenditure</b>	-0.141	0.012	-11.700	0.000	-0.164	-0.117	13.335
<b>Log of Inequality</b>	0.130	0.044	2.960	0.003	0.044	0.216	-1.035
<b>Disability</b>	-0.041	0.018	-2.310	0.021	-0.076	-0.006	1.934
Sex	0.018	0.011	1.630	0.104	-0.004	0.040	1.245
<b>Age</b>	-0.001	0.000	-1.780	0.074	-0.001	0.000	47.373
<b>Water Source</b>	-0.019	0.011	-1.740	0.082	-0.039	0.002	0.550
<b>Fuel Type</b>	-0.134	0.013	-9.940	0.000	-0.160	-0.107	0.297
<b>Father's Education</b>	-0.007	0.004	-1.900	0.058	-0.015	0.000	2.289
Mother's Education	-0.005	0.004	-1.110	0.265	-0.014	0.004	1.864
Assistance	-0.019	0.028	-0.680	0.495	-0.073	0.035	1.977

Transition into poverty (Wave 1 to Wave 2)

variable	dy/dx	Std. Error	z	P>z	[ 95% C.I ]		X
<b>Log of Mean Expenditure</b>	-0.076	0.009	-8.590	0.000	-0.093	-0.059	13.335
<b>Log of Inequality</b>	0.058	0.031	1.900	0.058	-0.002	0.118	-1.035
<b>Disability</b>	-0.027	0.011	-2.370	0.018	-0.050	-0.005	1.934
<b>Sex</b>	0.013	0.007	1.690	0.090	-0.002	0.027	1.245
Age	0.000	0.000	0.510	0.609	-0.000	0.001	47.373
<b>Water Source</b>	-0.019	0.007	-2.490	0.013	-0.033	-0.004	0.550
<b>Fuel Type</b>	-0.062	0.010	-5.920	0.000	-0.082	-0.041	0.297
Father's Education	-0.003	0.003	-1.250	0.212	-0.009	0.002	2.289
Mother's Education	-0.005	0.003	-1.390	0.165	-0.011	0.002	1.864
Assistance	-0.027	0.018	-1.540	0.124	-0.062	0.007	1.977

Transition into poverty (Wave 1 to Wave 3)

variable	dy/dx	Std. Error	z	P>z	[ 95% C.I ]		X
<b>Log of Mean Expenditure</b>	-0.094	0.009	-10.150	0.000	-0.113	-0.076	13.335
<b>Log of Inequality</b>	0.071	0.033	2.180	0.029	0.007	0.135	-1.035
Disability	-0.012	0.014	-0.840	0.399	-0.040	0.016	1.934
Sex	0.005	0.009	0.560	0.576	-0.012	0.021	1.245
<b>Age</b>	-0.001	0.000	-2.850	0.004	-0.001	-0.000	47.373
Water Source	-0.002	0.008	-0.270	0.790	-0.018	0.014	0.550
<b>Fuel Type</b>	-0.083	0.011	-7.750	0.000	-0.104	-0.062	0.297
Father's Education	-0.003	0.003	-1.140	0.253	-0.009	0.002	2.289
Mother's Education	0.000	0.003	0.100	0.920	-0.006	0.007	1.864
Assistance	-0.013	0.020	-0.650	0.514	-0.053	0.026	1.977