

Econometric Analysis of Poverty Driving Forces in Tanzania: An Assessment of Three-Dimensional Factors



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ABSTRACT: Purpose: The aim of this study was to assess poverty driving forces in Tanzania. Specifically, the study examined three dimensional factors that included; education access, unemployment and income inequality.

Methodology: The study employed an econometric analysis approach and paid attention to three key factors. These factors included, education access, unemployment and income inequality. National statistical data for a period of 10 years from 2012 to 2021 were obtained through literature review and processed through a regression model to examine the influence of the factors on poverty in the country

Findings: Results show that all the three examined factors had significant and positive influence on poverty in the country. However, unemployment and income inequality are more detrimental to this cause as opposed to education access.

Unique contribution to theory, practice and policy: Findings of the study reinforce the fact that poverty continues to be a threat to human dignity as well as an obstacle to realizing one's potential. Hence, four policy recommendations that include reviewing the education system, investing in youths, implementing pro-poor programs and financing action oriented research are recommended

KEYWORDS: Poverty, Education, Unemployment, Income Inequality and Econometric Analysis

1.0 INTRODUCTION

Poverty is a complex phenomenon for many countries to overcome, especially the developing and third world countries. Indeed, one of the efforts to overcome poverty is to improve economic performance by carrying out national development and creating jobs as well as organizing a decent life to realize the welfare of the population. As pointed out by Kuncoro (2010), poverty is one of the problems faced by all countries in the world. Poverty is considered as the inability to meet a minimum standard of living. Similarly, Susanto et al (2017) stated that poverty is an inability that is borne by a person, a family, a community or even in a country which creates anxiety in life, the precariousness of defending rights and justice, the precarious bargaining position (bargaining) in world association, the loss of generations, to the fading of the future of the nation and state. As per World Bank standards, poverty is measured at the income level of less than USD 2.00 per capita/day.

Generally, the importance of poverty reduction in economic and social development has raised a lot of interest in the past decade and this has culminated in a number of studies being done to investigate the relationship between poverty reduction and other economic variables. These studies have aimed at finding economic variables that have great positive impact on poverty reduction. On the other hand, most governments in developing countries are seeking solutions that will assist in eradicating poverty at all levels of the society, and this has resulted in developing and developed countries being signatories to the United Nations Millennium Development Goals (MDG) and Sustainable Development Goals. One of the MDG targets – to halve extreme poverty and hunger by 2015. Despite of this strong desire, the results have been uneven across countries, with Africa having large populations still trapped in poverty (UN, 2015).

Hence, although there is there is growing literature in support of a positive effect of economic growth on poverty reduction, addressing the problem of poverty is still a great challenge to many developing and third world countries. This paper therefore seeks to undertake an econometric analysis of poverty driving forces in Tanzania. Specifically, the paper draws attention to three critical factors i.e. education, unemployment and income inequality.

2.0 LITERATURE REVIEW

Tanzania joined other nations in the eradication of poverty after its commitment at the World Social Summit in Copenhagen in 1995 (The President's Office, 1995). This culminated in the formulation of poverty-oriented policies. In mainland Tanzania, the

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National Poverty Eradication Strategy of 1998 was formulated and poverty eradication was also incorporated into the long term vision, Tanzania Development Vision 2025, and the medium term policy, National Strategy for Growth and Reduction in Poverty (NSGRP) (Ministry of Finance and Economic Affairs, 2010). In Zanzibar, poverty reduction policies were incorporated into the Zanzibar Poverty Reduction Plan, Zanzibar Development Vision 2020 and Zanzibar Strategy for Growth and Reduction of Poverty (ZSGRP) (Revolutionary Government of Zanzibar, 2010).

Hence, in Tanzania mainland, the National Poverty Eradication Strategy provides guidance and a broad framework for poverty alleviation policies and programmes (Vice President's Office, 1998). The main goal of the strategy is to ensure active involvement of the poor in identifying and participating in poverty eradication programmes (Vice President's Office, 1998). The strategy sets target for the provision of social services, while sectors such as education and health are expected to set sectorial goals that will enable achievement of the targets set in the National Poverty Eradication Strategy. In Zanzibar, the Zanzibar Poverty Reduction Plan implemented from 2002 to 2006 provided the first step in the implementation of Zanzibar Development Vision 2020 targets related to poverty (Revolutionary Government of Zanzibar, 2001). Emphasis under this early policy response to poverty reduction was on supporting priority sectors that bring pro-poor growth (Revolutionary Government of Zanzibar, 2001).

Generally, poverty levels in Tanzania as measured by poverty headcount have decreased over the years (National Bureau of Statistics, 2014). In this case, poverty headcount is defined as the percentage of the population living below the poverty line (National Bureau of Statistics, 2014) and the country has two poverty lines, namely food poverty and basic needs poverty.

As of 2016, Tanzanian population below the poverty line accounted for 3.6 percent of the world population living on a maximum of 1.90 U.S. dollars daily and by 2022, around four percent of the world population in extreme poverty lived in Tanzania, considering that the poverty threshold was still at 1.90 U.S. dollars a day. Figure 1 illustrates the share of the population leaving below extreme poverty line in Tanzania from 2016-2022.

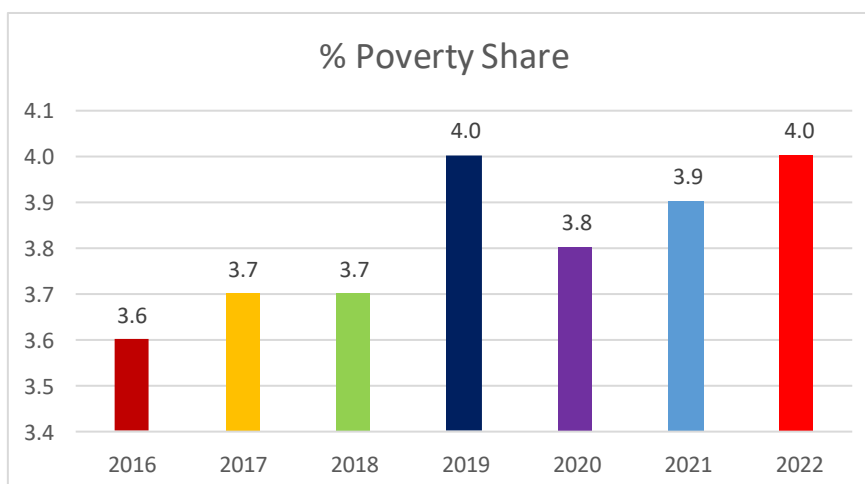


Figure 1: Percentage Poverty Share in Tanzania (2016-2022)

2.1 Link between Education Access, Unemployment and Income Inequality to Poverty

There are strong indications that education access, unemployment and income inequality greatly influences poverty. For instance, education is considered to be one of the most effective ways to combat poverty. This is because education has the power to transform people's lives and create opportunities for personal and economic growth. A study by Global Citizen (2020) shows that every year, education can increase an individual's income by up to 10%. Education can also provide people with the skills and knowledge they need to secure employment and become financially independent. On the other hand, a lack of education can perpetuate poverty and hinder economic growth. Hence, when individuals do not have access to education, they may not acquire the necessary skills and knowledge to find employment or create economic opportunities for themselves. This can lead to a cycle of poverty, where individuals and families struggle to make ends meet and are unable to improve their standard of living.

Unemployment is another important factor that has strong links to poverty. In fact, according to the National Bureau of Economic Research (2022), unemployment is a significant determinant of poverty and thus poverty and unemployment have an important nexus. This is because those who fail to avail employment become a burden on the limited family income and thus, per capita consumption level decreases. The decrease in consumption levels further decreases an individual's earning capacity and thus unable to escape the vicious circle of poverty. It has been observed that most of the poor are either unemployed or intermittently employed as casual labourers. The uncertainty of income does not enable them to meet their basic needs and they are caught in poverty. Therefore, we can safely conclude that a high degree of positive correlation exists between poverty and unemployment.

In the context of this study, income inequality is also seen as an important driver poverty. The study by the National Bureau of Economic Research (2022) also affirms this by pointing that wage inequality strongly determines poverty. Measured by the Gini Coefficient, Besley and Burgess (2003) in their study found a positive and significant association between inequality and the level

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of poverty within a country. However, Honohan (2004) points out, this association could almost be tautological. The author argues that if the mean income is held constant the more of the national income is taken by the rich the less is available for the rest and more people are likely to be poor.

2.2. Trends in Education Access, Unemployment and Income Inequality in Tanzania for the Period 2012-2021

This section as shown in Table 1 highlights trends in education access rate, unemployment rate and income inequality rate in Tanzania for the ten-year period from 2012 to 2021.

Table 1: Trends in Education Access, Unemployment and Income Inequality in Tanzania for the Period 2012-2021

Year	Poverty Rate	Education Access Based on Primary Enrolment Rate	Unemployment Rate	Income Inequality Rate Based on Gini-Coefficient
2012	28.2	88.8	3.26	0.340
2013	27.6	85.5	2.93	0.378
2014	26.7	86.8	2.12	0.376
2015	27.5	84.7	2.14	0.405
2016	27.0	85.3	2.15	0.378
2017	26.4	89.2	2.17	0.380
2018	26.0	94.2	2.20	0.390
2019	26.2	96.3	2.21	0.405
2020	25.7	96.9	2.78	0.409
2021	27.0	97.1	2.80	0.486

Source: Literature Review, 2023- See Selected Data Sources in Section 5.0

3.0 METHODOLOGY

The data used in this study are poverty data, education access, unemployment rate and income inequality represented by the Gini index in Tanzania for a period of 10 years from 2012 to 2021. Data collection technique was mainly from literature sources on national data relating to education access based on primary enrolment, unemployment and income inequality in Tanzania from 2012 to 2021. Data analysis used in this study is panel data regression estimation to measure the effect of education access, unemployment and income inequality on poverty. The analysis involved Descriptive Statistics analysis, F Test, Durbin-Watson Test, Linearity Test, Test for Joint significance of the Explanatory Variables, Test of Multicollinearity Using the Variance Inflation Factor and Test of Variation in Dependent Variables due to changes in Independent Variables.

3.1 Data and Variables

This study employs annual panel data on Education access (E) based on primary school enrolment rate as a proxy for access to education, GIN index rate as a proxy for income inequality (II), and total unemployment rate (UE) - as % of the labor force to depict the proportion of total labor force willing and able to work but without work, all for the period 2012–2021.

3.2 Empirical Model Specification

The study employs the Multiple Linear Regression (MLR) model to examine the prevailing influence that the independent variables i.e education access, unemployment and inequality have on poverty as a dependent variable. Hence, the MLR applied in this study is as follows;

$$Poverty = \{Education\ access, Unemployment, Income\ Inequality - Gini\ index\}$$

$$Poverty = \sum \beta_0 + \beta_1 E_t + \beta_2 UE_t + \beta_3 II_t + \epsilon_t$$

4.0: FINDINGS AND DISCUSSIONS

4.1 Descriptive Statistics for Study Variables

The data used in this study is secondary data covering a period of ten years from 2012 to 2021. Hence, the study gathered data on four variables that include poverty rate, education access, unemployment and income inequality. Descriptive statistics for each of the variable is as shown in Table 2 below.

Table 2: Descriptive Statistics for Study Variables

Year	Poverty Rate	Education Access	Unemployment	Gini Index
1	28.2	88.8	3.26	0.34
2	27.6	85.5	2.93	0.378
3	26.7	86.8	2.12	0.376
4	27.5	84.7	2.14	0.405
5	27.0	85.3	2.15	0.378
6	26.4	89.2	2.17	0.38
7	26.0	94.2	2.2	0.39
8	26.2	96.3	2.21	0.405
9	25.7	96.9	2.78	0.409
10	27.0	97.1	2.80	0.486
Sum	268.3	904.8	24.76	3.947
Mean	26.83	90.48	2.476	0.3947
Kurtosis	0.000	0.000	0.000	0.575
Max	28.2	97.1	3.26	0.486
Min	25.7	84.7	2.12	0.34

Source: Literature Review, (2023)

Based on the descriptive statistics results, it can be seen that in a period of 10 years i.e from 2012 to 2021, average poverty rate was 28.2%, education was 90.48%, unemployment was 2.48% while income inequality presented by the Gini index was 0.395. Despite of the fact that there was good performance in terms of improving education access, the accumulated education access appears not to have had significant impact on reducing poverty whose average rate stands at 28.2%.

In this case, this poverty rate is still a cause for concern and will have an impact on all aspects of people’s wellbeing as long as well articulated efforts are not put in place. As stressed by Rouf, (2017), solutions to poverty need to be found locally. This implies that even the nature of poverty must be defined locally.

From the results as presented in Table 2, unemployment appears to have remained within fixed ranges of between 3.26 to 2.12 with an average of 2.48 for the entire 10-year period. Ideally, this implies that during the 10 years under review in this study, there has also contributed to poverty in the country within minimal levels.

In the case of income inequality, the Gini coefficient measures the extent to which the distribution of income within a country deviates from a perfectly equal distribution. A coefficient of 0 expresses perfect equality where everyone has the same income, while a coefficient of 100 expresses full inequality where only one person has all the income. Hence, although there are no internationally defined standard cut-off values, it's commonly recognized that Gini index <0.2 corresponds with perfect income equality, 0.2–0.3 corresponds with relative equality, 0.3–0.4 corresponds with a relatively reasonable income gap, 0.4–0.5 corresponds with high income disparity.

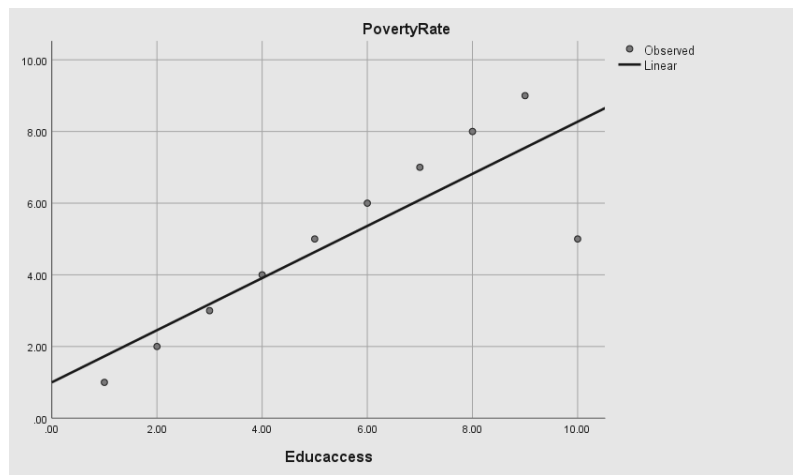
Based on the descriptive statistics results as shown in Table 2, the average Gini index for the entire 10 years is seen to be 0.395. By interpretation, this implies that this result corresponds with a relative reasonable income gap. In short, there is an income gap which appears to be reasonable. Again, although the Gini-index results show that the existing income gap is a bit reasonable, there is a clear indication that this situation has also been contributing to increase in poverty rate in the country.

4.2 Linearity Test for Study Variables

A linearity test was carried out to test the existence of a linear relationship between the dependent variable and the independent variables. Results of tests between poverty and each of the three independent variables were as presented.

4.2.1 Linearity Test for Poverty Vs Education Access

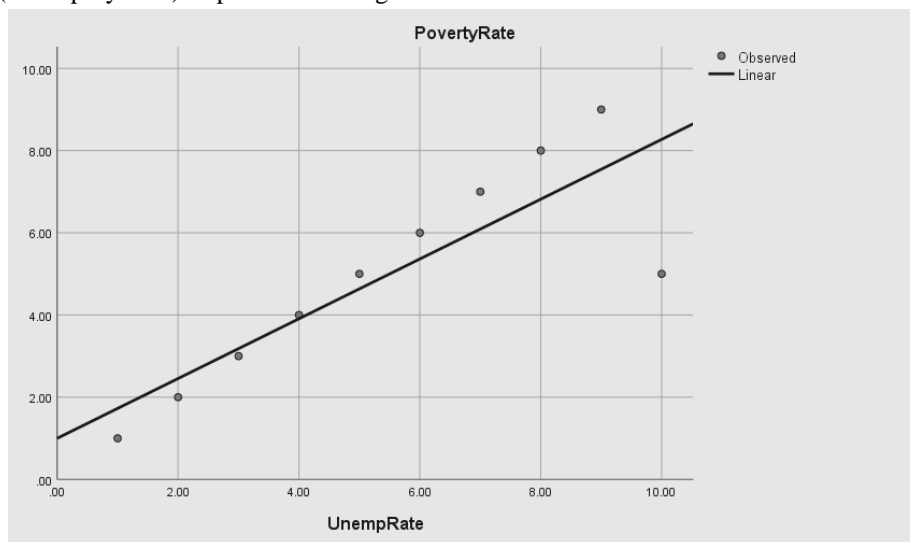
A scatter plot was employed and showed that there was a linear relationship between the analyzed dependent (Poverty) and independent variable (Education Access) as presented in Figure 2.



Source: Processed Data, 2023

4.2.2 Linearity Test for Poverty Vs Unemployment

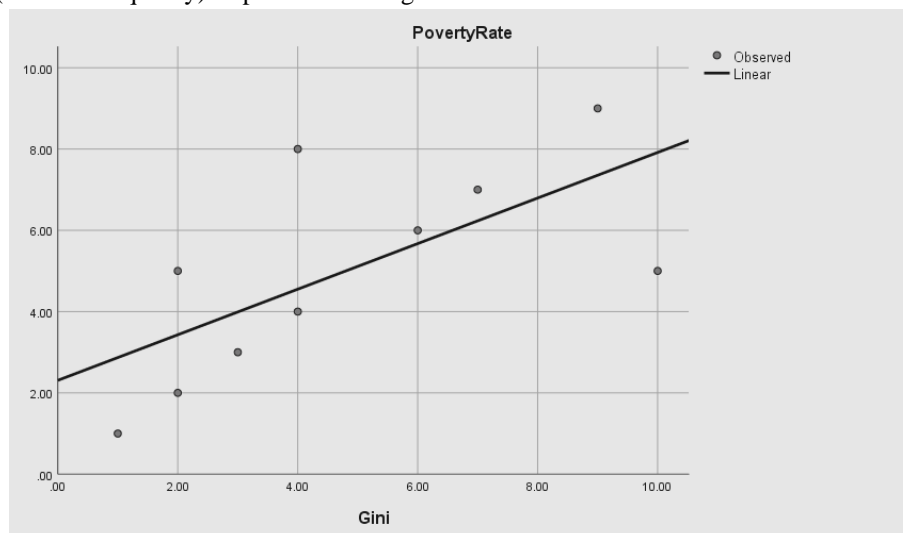
A scatter plot was employed and showed that there was a linear relationship between the analyzed dependent (Poverty) and independent variable (Unemployment) as presented in Figure 3.



Source: Processed Data, 2023

4.2.3 Linearity Test for Poverty Vs Income Inequality (Gini-Index)

A scatter plot was employed and showed that there was a linear relationship between the analyzed dependent (Poverty) and independent variable (Income Inequality) as presented in Figure 4.



Source: Processed Data, 2023

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4.3 Test of Autocorrelation using the Durbin-Watson Test

The Durbin-Watson test was undertaken to test for autocorrelation also referred to as serial autocorrelation in the residuals of the regression analysis model used in the study. The researcher was aware of the fact that failure to test for autocorrelation in a study of this nature would have led to underestimating of the standard error and cause a thinking that the predictors are significant when they are not. Results of the test are as presented in Table 3.

Table 3: Test of Autocorrelation using the Durbin-Watson Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.870 ^a	.757	0.687	1.44434	1.874

According to Lambert (2014), as a rule of thumb, statistic test values of the Durbin-Watson test ranging from 1.5 to 2.5 are considered to be relatively normal. However, any values outside this range could be cause for concern. This study registered a Durbin- Watson statistic value of 1.874, which implied that there was a positive autocorrelation and no cause for concern.

4.4 Test for Joint significance of the Explanatory Variables

This test aimed at testing the difference in means among variables for statistical significance. Generally, ANOVA analysis is intended to investigate whether the variation in the independent variables explain the observed variance in the outcome of poverty in Tanzania. The analysis of variance findings showed that there was correlation between the independent variables and the dependent variables since the P-value of 0.007 was less than 0.05 as revealed in Table 4.

Table 4: ANOVA-Test

Model	Sum of Squares	ANOVA ^a			
		df	Mean Square	F	Sig.
Regression	45.397	2	22.699	10.881	.007 ^b
Residual	14.603	7	2.086		

4.5 Test of Multicollinearity Using the Variance Inflation Factor

The general rule of thumb for testing multicollinearity using VIF is that VIFs of 10 are signs of serious multicollinearity requiring correction. This study tested for multicollinearity in its variables and the results showed that, none of the VIFs was 10 and above. This implies that there were no serious multicollinearity requiring correction. Table 5 below presents details of the analysis.

Table 5: Multicollinearity Test Using VIF with Poverty as the Dependent Variable

Model	Collinearity Statistics	
	Tolerance	VIF
Education Access	.256	2.502
Unemployment	.225	4.453
Gini-Index	.277	4.474

Source: Processed Data (2023)

4.6 Test of Variation in Dependent Variables due to changes in Independent Variables

In order to test any possible variation in dependent variables as a result changes in independent variables, this study employed the R Squared coefficient of determination which tells us the variation in dependent variables as a result of changes in the independent variables. Based on the results of the study, the statistical value of the R squared was found to be 0.870 which indicates that 87% of the variance in the dependent variable (poverty) can be explained by the independent variable(s) included in the model. On the other hand, results of the R correlation coefficient revealed that there was a positive relationship between the study variables as shown by the R statistic value of 0.933 (93.3 %). Table 6 below provides a summary of this analysis.

Table 6: Test of Variation

R	R- Square	Adjusted R-Squared
0.933	0.870	0.757

Source: Processed Data, 2023

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4.7 Estimation Results Based on the Panel Regression Model

The estimation results based on the panel data regression model are as showed in Table 6.

Table 6: Estimation Results Based on the Panel Regression Model

Variable	Coefficient	Sig.
Constant	33.3894	0.000
Education	2.1362	0.340
Unemployment	4.3821	0.000
Gini-Index	3.0326	0.000
Weighted Results		
R- Squared		0.870
Adjusted R Squared		0.757
Sum of. Squared Residues		45.397
F. Statistics		10.881
Prob (F-Stat)		0.007
Durban-Watson		1.874

Source: Processed Data, 2023

4.7.1 Interpretation of Model Results

Results of the model show that all the three examined independent variables i.e. Education access, unemployment and income inequality have a statistical significance in explaining the dependent variable (Poverty) because their levels of significance were below 0.05. However, an in-depth analysis of the results further shows that during the 10-year period under review in this study, unemployment and income inequality deeply accelerated poverty among Tanzanians. Hence, although education was also found to be a contributory factor, its influence during the period 2012-2021 is seen less as per results of this study. This implies that there have been substantial efforts by the government of Tanzania and education stakeholders to ensure that all children in Tanzania have access to education. This is reflected in the prevailing education policies put in place by the Tanzanian government. For instance, the free education policy which implies that all children can freely access education at both primary and secondary education levels. On the contrary, results of this study tend to reveal that efforts to address unemployment and reducing income inequality gap have either been weak or not strong enough to address the matter during the 10-year review period. As a result, unemployment and income inequality have substantially contributed to the growing concern of poverty in the country.

5.0 CONCLUSION & POLICY RECOMMENDATIONS

CONCLUSION

This paper has used econometric analysis approach to examine poverty driving factors in Tanzania during the 10-year period from 2012-2021. Precisely, the paper has paid attention to three factors that include education access measured by primary school enrolment rate, unemployment based on annual unemployment rates and income inequality measured on the basis of annual Gini-index. Results have shown that there is a significant and positive relationship between poverty that prevailed during the 10-year review period and the examined independent variables (Education access, Unemployment and Income Inequality). This implies that all the three examined factors have during the period 2012-2021 contributed to poverty increase in Tanzania. However, unemployment and income inequality have been more detrimental in accelerating the poverty challenge in the country.

5.1 Policy Recommendations

On account of the results of this study, the following policy recommendations are put forward;

- Although the government of Tanzania and its education partners have put much effort in ensuring that there is access to education among all primary school going children, results of this paper have shown that such achievements have not been sufficient in addressing the issue of poverty in the country. Hence, as a policy recommendation, this paper recommends that the education system should be reviewed to incorporate learning activities that will prepare children to be more creative, innovative and self-reliant.
- Unemployment and income inequality as revealed in this paper are serious catalysts of poverty in the country. This study therefore recommends that deliberate result-oriented actions should be adopted. For instance, actions such as investing in youths' technical skills among others could be adopted.

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- iii. The government and development partners should also pay more attention to programs that are pro-poor to the poor so as to reduce poverty. Programs that target key strategic sectors of the economy such as agriculture and Small Scale Business Enterprises among others could provide the gate pass for addressing poverty in the country.
- iv. Finally, the government and development partners should consider financing action-oriented research that will assist in unveiling practical solutions for adoption so as to address poverty in the country.

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