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The Effect of Government Sectoral Expenditure on Poverty Level in Kenya

Loyce V. Omari[1*] Willy Muturi[2]

1. Student at the School of Business, Jomo Kenyatta University of Agriculture and Technology, P.O Box 30437, Nairobi, 00100, Kenya
2. School of Business, Jomo Kenyatta University of Agriculture and Technology, P.O Box 62000, Nairobi, 00200, Kenya

Abstract

Poverty eradication has been one of the policies that has been pursued since independence years in Kenya. This study investigated the effect of sectoral government expenditure on poverty level in Kenya. Private Consumption per capita, a proxy measure for poverty, was the independent variable while education sector expenditure, health sector expenditure, agriculture sector expenditure and infrastructure sector expenditure were the independent variables. Time series data for the period of 1964-2010 was used and was tested for unit root using Augmented Dickey Fuller test whereby all variables were found to be integrated to I(1). The lag length as selected by Vector Autoregressive model was three. Co-integration analysis and error correction mechanism were used to establish presence of long run and short run relationships among the study variables. Presence of co-integration was confirmed using the Johansen test which showed there was one co-integrating equation. Vector Error Correction model indicated that there was a stable long run relationship between poverty level and sectoral government expenditure in Kenya. The regression results showed that agriculture sector and health sector expenditures have a positive and significant effect on poverty level while infrastructure sector expenditure has a negative and significant effect on poverty level. The effect of education sector expenditure on poverty level was insignificant. It is recommended that the government in Kenya increases expenditure allocation to agriculture and health sectors.

Keywords: Poverty, government sectoral expenditure, co-integration, vector error correction

1. Introduction

There is a lot of effort globally directed at development and for the development community the highway to development is poverty eradication. With the many policies, programs and declarations put by the development community a true solution to poverty eradication has remained elusive. The most visible effort was the Millennium Declaration of the United Nations of September 2000 in which the Millennium Development Goals (MDGs) were adopted. On top of the list of the MDGs was 'to eradicate extreme poverty and hunger' and the goal had three targets. Target one specifically related to poverty and it was to 'halve, between 1990 and 2015, the number of people whose income is less than $1.25 a day' (United Nations). This target was met five years ahead of schedule in which the 2010 global poverty rate at $1.25 a day fell to less than half the 1990 rate i.e. 700 million fewer people lived in conditions of extreme poverty people (United Nations). Despite meeting that target the United Nations put the number of people still living in extreme poverty at 1.2 billion as at 2010. In 2006 2.7 billion people lived in poverty at a poverty rate of $2 a day (UN Millennium Project, 2006). Upon expiration of the MDGs in 2015, a new development agenda was unveiled in the name of Sustainable Development Goals (SDGs) which comprise seventeen goals to be pursued over the next fifteen years (UNDP, 2016). Goal one of the SDGs is to end poverty in all its forms everywhere.

Globally, the MDGs were on track but some regions and countries were off the track during the MDGs period. Asia's large economies of India and China contributed most to the global strides. Africa specifically was off track on most goals including on goal one of poverty reduction except for the goals on promoting gender equality gender and empowering women and combating HIV, TB, malaria and other diseases (UNDP, 2013). Owing to the growth of the economy in Africa, extreme poverty has declined but the decline has not been fast enough to have reached the 2015 poverty target. The World Bank seeing the optimism in ending extreme poverty through the MDG poverty target, in April 2013 set two new goals: to end extreme poverty and promote shared prosperity in its client countries among them Kenya. World Bank's poverty goal is to reduce global poverty to 3 per cent by 2030. The war on poverty is thus a continuous effort world over with Kenya being no exception.

During the pre-independence period Kenya like many other African colonies at that time was characterized by deprivation of the natives. White settlers took all the fertile and productive land; the natives lived together in poor housing units and their primary duty was to slave at the farms which produced raw material for the colony's home country. Kenyans then were left with no sufficient means to feed themselves given that the economy was mainly agrarian during pre-colonial period. Kenyans hardly had access to health care, education or any other social service and those who got jobs with the colonial government were poorly paid and worked under gruesome conditions. As a result a many Kenyans lived in extreme poverty. Upon attainment of independence the government decided to pursue poverty alleviation alongside economic growth. Despite the open declaration to fight poverty, poor governance and corruption caused poverty to become rampant and the poor were further marginalized while a few people took over the settlers' land and their oppressive nature. Nevertheless, the government as part of its development objectives put in place policies and programs to eradicate poverty. First of those efforts were in the Sessional Paper No. 10 of 1965 and the Sessional Paper No.10 of 1973. The Sessional Paper No. 10 of 1965 was the launch pad for the country's economic and social development with focus on elimination of poverty, disease and illiteracy. The Sessional Paper No.10 of 1973 set out strategies based on objectives spelt out in sessional paper no 10 of 1965 one of the being the enabling of the most poor to share in the country's economic benefits. There are various literature that show that poverty worsened after independence especially when the economic performance took a nose dive which resulted into Structural Adjustment Programs (SAPs) in 1980s by the World Bank and International Monetary Fund (IMF).

In between the government continued to implement new policies among them the District Focus for Rural Development (DFRD) in 1983 which sought to stimulate rural economies to contribute to the national output and to reduce rural poverty. It has been found that the poverty incidence is higher in the rural areas compared to the urban areas. This was followed by Sessional Paper No.1 of 1986 on Economic Management for Renewed Growth whose preparation was informed by poor economic performance and worsening poverty levels. It reinforced the implementation of SAPs with more focus on economic growth and the subsequent results was that Kenyans were economically hurt by the programs especially liberalization that saw commodity prices go up and cost sharing of services like healthcare and education. However, a study done by Kabubo-Mariara and Kiriti (2002) found that macroeconomic policies put in places through SAPs resulted to decreased poverty levels attributed to improvement in economic growth. The need by government to cushion the poor resulted to launching of the Social Dimension of Development (SDD) Programme in 1994. This programme was not effective due to lack of political good will, under-budgeting and diversion of funds.

Since 1966 the government drew up National Development Plans of which each covered a five-year period except the 1994 plan which spanned three years and the 2001 plan which spanned seven years. These plans contained policies towards poverty eradication some of which were not implemented or were duplications. In 1999 a single long-term plan was unveiled by the name of the National Poverty Eradication Plan (NPEP) covering the period 2000-2015 adopted in line with the International Development Goals to halve global poverty (Republic of Kenya, 2001). The NPEP was implemented through short-term strategies called Poverty Reduction Strategy Papers (PRSPs). World Bank and IMF initiated the PRSPs in a bid to make country members own the reform programmes and increase focus on poverty reduction efforts. Other than the PRSPs being crucial in the attainment of the MDG poverty target, the PRSPs informs the World Bank and IMF concessional lending policies in the Highly Indebted Poor Countries (HIPC) initiative in which debt relief is seen as key to poverty reduction. The first PRSP paper was for the period 2001-2004, this and later PRSPs were formulated as pro poor and pro-growth with the recognition that economic growth alone was not enough to reduce poverty.

In 2002 there was change of government whose key promise was economic growth and the new government realigned policies and plans towards fulfilling this promise. In addition to the existing plans and policies, the Economic Recovery Strategy (ERS) was unveiled in 2003 to put Kenya on an economic recovery road after a slump in economic growth for over two decades with worsened poverty situation (Republic of Kenya, 2003). The ERS aimed to revitalize growth and create employment which in turn would reduce poverty. In the blueprint, it was recognized that interventions will be required through education, healthcare, housing, social security among others to directly address the poverty situation while pursuing pro-poor growth. Through the ERS the economy improved from a growth of 0.5 per cent in 2003 to 7 per cent and poverty declined from 56.8 per cent in 2000 to 46 per cent in 2006 (International Monetary Fund, 2010).

Replacing the ERS was the Kenya Vision 2030 a long term economic blueprint towards becoming "a globally competitive and prosperous country with a high quality of life by 2030" (Republic of Kenya, 2008). Kenya Vision 2030 is divided into three parts i.e. economic, social and political pillar with each containing the means by which to attain middle income status in which the economy would grow at a projected rate of 10 per cent per

annum. The particular activities termed as flagship projects to be undertaken are contained in Medium Term Plans (MTPs) which are strategic five-year plans towards attaining Vision 2030 and are used to guide the budgeting process. The MTPs are also presented to the World Bank and IMF as the country's PRSPs. Under the social pillar, Kenya is to achieve a reduction in poverty by between 3 and 9 percent from 46 per cent level of poverty as at 2006 (Republic of Kenya, 2008).The achievement of ERS and the Kenya Vision 2030 are also to contribute towards the achievement of the Millennium Development Goals (MDGs) for Kenya.

The aim of this paper is to investigate the effect of government sectoral expenditure allocation on poverty in Kenya, which will serve to show whether economic benefits in terms of poverty reduction differ by the level of funds allocated to a particular sector. The rest of this paper is organised as follows: Chapter one finishes with an overview of poverty, the statement of problem, objectives of the study and research questions. Chapter two follows with review of theoretical and empirical literature and chapter three contains the research methodology. Chapter four and five detail the research results and conclusion respectively.

1.1 Understanding of Poverty

Poverty has been defined and presented in many ways and as Chambers (2006) puts it there are as many answers to the question 'what is poverty' as there are many people responding to it depending on who asks them. Over time poverty has developed a multi-dimensional approach. The most common definition of poverty is based on income or consumption and defines poverty as the state of lack of minimum income or consumption level sufficient to meet basic needs. Poverty is also defined as the lack of basic necessities of life and opportunities for development. Poverty also is the inability to keep up with the standards prevalent in a given society (Maxwell, 1999). Chambers (2006) clusters the meaning of poverty into five based on a) income, b) material want or want, c) capability deprivation, d) multi-dimensional view of deprivation with material lack, and d) multiplicity of meanings as defined by the poor themselves. Chambers attributes clusters a) to d) to have been out of the perceptions of the non-poor and development professionals.

There are various indicators of poverty including malnutrition, high mortality rate, illiteracy and lack of access to education, safe drinking water, health care and housing. In deciding who is poor the World Bank in 1990 decided upon an operational measure of the poverty line i.e. consumption or income of less than a dollar a day or two dollars per day for least income countries. The poverty line provides a threshold below which people are said to be poor. It is determined based on the expenditure required to purchase a food basket that allows minimum nutritional requirements to be met in addition to the costs of meeting basic non-food needs (Republic of Kenya, 2014). Two main measures of poverty applied in Kenya are the poverty incidence (headcount ratio) and the poverty gap. As defined in the Economic survey, 2014, for Kenya, poverty incidence refers to the number of individuals whose consumption expenditure is below the poverty line as a percentage of the total population. In 2005/06 when the last household budget was done, the poverty line was calculated at Ksh1,562 and Ksh2,913 per adult equivalent per month for rural and urban households respectively (Sivi, 2013). The survey defines poverty gap as how far the poor are from the poverty line and it captures the mean aggregate expenditure consumption shortfall of the poor across the whole population expressed as a percentage of the poverty line (Republic of Kenya, 2014).

1.2 Statement of Problem

Kenya clearly does not seem to be short of policies to stem poverty yet significant gain in poverty reduction is yet to be achieved. The years between 1980 and 1999 saw the poverty situation worsen and this called for more interventionist approach to dealing with poverty. Kenya was expected to halve its poverty incidence from 43.3 per cent in 1990 to 21.7 per cent by 2015 as per her MDG target of poverty (Republic of Kenya, 2012). The share of poorest quintile i.e. 20 per cent in national consumption ought to have been at 9.6 per cent in 2015 expected to have increased from the baseline of 4.8 per cent in 1990. According to MDGs status reports that had been compiled through the period of MDGs detailing progress for whole of Africa showed that Kenya was off track in attaining goal one on eradicating extreme poverty and hunger. As at 2015, the closing year for MDGs target one on poverty had not been met.

The poverty incidence for Kenya has been increasing with few episodes of recorded decline. The number of people living in poverty increased in 1992 to 44.7 per cent from 43.3 per cent in 1990; this further increased to 52.6 per cent in 1997 and further still increased to 56 per cents in 2002 (Republic of Kenya, 2005). According to KIPPRA (2013) the poverty level did reduce to 46.1 percent in 2006 but surged upwards following the post-

election violence of 2007/8 which put poverty level at 50.8 per cent. The poverty head count ratio as at 2012 stood at 49.8 per cent. Poverty incidence is higher for rural Kenya than urban Kenya given the deplorable state of rural infrastructure, limited rural livelihood opportunities, high youth unemployment and limited access to quality education (UNDP, 2013). According to the Economic Survey of 2014, it records that of the 52.6 per cent poverty incidence of 1997 rural poverty incidence was 53.1 per cent while the urban one was 50.1 per cent; in 1999 the rural poverty incidence was 52.8 per cent compared to urban poverty incidence of 49.5 per cent; and from the KHBS survey of 2005/06 the rural poverty incidence was at 49.7 per cent while the urban poverty incidence was at 34.4 per cent (Republic of Kenya, 2014).

As per Kenya's economic blue print, Vision 2030, under the Social Pillar, to attain a socially-just and equitable society, one of the strategic policies would be reducing poverty by between 3 and 9 per cent from about 46 per cent head count ratio. To this end there are flagship projects and programmes which have been identified for implementation which are contained in the MTPs (serving also as PRSPs) that inform the budgetary allocation. The flagship projects are being implemented in different sectors to achieve the overall goal. Therefore, there is need to establish what impact the composition of government expenditure has on poverty reduction efforts in Kenya.

1.3 Objectives of the Study

The main objective of this study is to investigate the effect of government sectoral expenditure on poverty level in Kenya.

The specific objectives for the study are as follows:

1. To investigate the effect of education sector expenditure on poverty level in Kenya.
2. To investigate the effect of health sector expenditure on poverty level in Kenya.
3. To investigate the effect of infrastructure sector expenditure on poverty level in Kenya.
4. To investigate the effect of agriculture sector expenditure on poverty level in Kenya.

The choice of the specific objectives was informed by various studies which have shown that the poor interact most with these sectors thus the level of expenditure is likely impact them.

1.4 Research Questions

The main research question is: Does public spending composition lead to poverty level?

The following specific research questions shall be examined in the course of the study:

1. What is the effect of education sector expenditure on poverty level in Kenya?
2. What is the effect of health sector expenditure on poverty level in Kenya?
3. What is the effect of infrastructure sector expenditure on poverty level in Kenya?
4. What is the effect of agriculture sector expenditure on poverty level in Kenya?

1.5 Justification of the Study

The findings of the study will be significant in a number of ways to different groups. Theoretically, the findings will contribute to existing literature on the subject of public spending composition and economic welfare specifically poverty reduction. It will further contribute to arguments on Keynesian theory about use of fiscal policies to achieve certain macroeconomic targets. To the research community it will open up new research questions as a result of challenging some existing theories and these questions will need to be addressed thus enhancing new theory formulation and research work. Empirically, the findings of this study will be useful to the government and policy makers for the purpose of formulation and implementation of an optimal sectoral expenditure allocation framework and poverty reduction strategy for Kenya. The findings will also be useful in justifying allocations made to particular sectors.

1.6 Scope of the Study

The study covered the period from 1964 to 2010 and evaluated annual data relating to Kenya on education sector expenditure, health sector expenditure, infrastructure sector expenditure, agriculture sector expenditure and

poverty variables. The first year of the study period is right after Kenya gained her independence and set out to eradicate poverty while the last year of the study marked the end of the post independent constitution which was based centralized government.

1.7 Limitation of the Study

The most appropriate measure of poverty should be the poverty headcount ratio. However, given that the poverty headcount ratio is calculated from household surveys and national census which are done periodically, it is not possible to obtain poverty head count ratios for each year for the period selected for the study. There are estimation techniques which could be used for estimating data on poverty headcount ratio for the years in which surveys were not done but they would not be very accurate. Moreover, even for years that surveys are done the data collected may be inaccurate due inaccurate responses from respondents. Therefore, private consumption per capita was used as the most appropriate proxy measure for poverty in Kenya given that measurement of poverty headcount ratio is based on adult consumption expenditure in a period.

2. Literature Review

2.1 Theoretical Literature

Various literature have classified theories of poverty in different ways and the theories have evolved over time. The theories explain poverty: what brings about poverty, what perpetuates poverty and how to address poverty. The theories link different factors that are thought to cause and perpetuate poverty (Bradshaw, 2006). It is expected that the underlying cause of poverty should inform policy action in efforts towards poverty eradication. While Elesh (1970) asserts that the main theories of poverty are too general, presented in a simplistic manner and lack empirical verification, they provide a useful framework for optimal forms of intervention. In this section these theories are detailed and they span from micro to macro causes of poverty; from classical economics to liberal and neo-liberal economics to socio-political economics.

2.1.1 Classical Theory of Poverty

This is the oldest theory of poverty and according to classical economics, the market is self-regulating and resources are efficiently assigned to production units. Redistribution of output is also as a result of free market and wages reflect one's productivity and as such poverty results from individual choices about work. Therefore, poverty is seen not to be as result of market failure but poor economic decisions of individuals such being lazy or being uneducated (Davis & Sanchez-Martinez, 2014). Further, living in deprivation is as a result of individual decisions and that hard work and better choices are sufficient to lift one out of poverty. It is generally viewed by the non-poor that people who live in poverty deserves it and the poor tend to choose and nurture a culture of poverty which leads to intergenerational poverty i.e. 'poverty begets poverty' (Davis & Sanchez-Martinez, 2014). Bradshaw (2006) notes that the American Values of Individualism is based on the fact that hard work, motivation and persistence can cause one to succeed and therefore failure is as result of individual decision, so is poverty. This implies society or government has no part in one's plight of poverty.

Interventions to eradicate poverty of this nature through public spending are highly discouraged as it interferes with automatic market mechanism and may result to inefficiency ultimately. However, the government can provide support activities and programmes that would facilitate individual to engage in productive activities to earn a wage. Classical economists insist that if anti-poverty programmes have to be implemented they have to entail a self-help element to enable the poor on their own accord find a way out of deprivation. It is argued that with welfare programs, the actual the number of people living in poverty is likely to increase as individuals may choose not to work and opt to be recipients of welfare programs. Therefore, intervention by the government to stem this kind self-inflicting poverty is seen to reinforce poverty as it makes individual to be welfare dependency and it disincentives effort by individuals to be more productive.

2.1.2 Keynesian Theory of Poverty

An assumption is implicitly made by classical economists that key determinants of poverty are an individual's characteristics. Rankin and Quane (2000) could not empirically verify the culture of poverty. Elesh (1970) has challenged the culture of poverty proposed in classical economics not to be consistent among the poor and empirical findings do not support the similar characteristics and values said to be among the poor. This led to a

shift in explaining poverty mainly by Keynesians or liberals without the blaming-individual ideology. Keynesians acknowledge that there exists unequal initial endowment in terms of talent, skills and capital in which determine an individual's level of productivity. Marshall and Keynes explain poverty to have been caused by economic underdevelopment and lack of human capital (Jung & Smith, 2006). There also exist market failures such as uncertainty which may perpetuate one's economic situation given that the poor are more vulnerable to shocks that affect their income.

According to Keynesian economics, poverty is seen as a result of structural factors which could be economic or social or political. The proponents of this theory acknowledge that the poor are impoverished due to external reasons mostly beyond their control. According to the liberal approach; market distortions, institutional rigidities and general underdevelopment do cause poverty rather individual choices. Intervention by the government is viewed as a means to promote economic development and welfare (Davis & Sanchez-Martinez, 2014). During the Great Depression of the 1930s, J M Keynes, a British economist argued that government intervention through expansionary fiscal policies was necessary to stimulate aggregate demand and create jobs thus reducing unemployment. Increasing employment is critical given the poor gain income by offering their labour as their sole asset (Hull, 2009). Structural factors such as poor levels of human capital and lack of business capital, infrastructure and public institutional capacity always act to increase poverty levels by way of causing involuntary unemployment. In such situation, government intervention would be necessary to stimulate the economy and via multiplier effect reduce poverty.

2.1.3 Marxist Theory of Poverty

The Marxist theory is a radical theory which shifts from the orthodox economic theories of poverty and focus on the role of the nature of demand for labour, non-individual characteristics that determine wage levels and the nature of labour markets. The Marxists explains the existence of poverty from a political economy approach in which poverty is as a result of capitalism and related social and political factors based on class division. According to Marxism, the market is inherently dysfunctional (Blank, 2003; Bradshaw, 2006) in which in capitalist economies, the owners of capital which is the ruling class will earn more while owners of labour will earn much less since the cost of labour is kept unnaturally lower than its valued added through the threat of unemployment by maintaining a 'reserve army of unemployed' (Davis & Sanchez-Martinez, 2014). Low wages prevent the poor labourers from saving and makes it highly probable that these labourers would slide further into poverty in the event of shocks.

Further the existence of dual labour markets in which the labour market is classified as either primary or secondary sector. In the primary sector employment is stable, wages are good and there exist strong labour unions whereas in the secondary market employment is unstable, wages are very low, prospects of promotion are very poor and labour unions holds no sway. In explaining poverty, the Marxist theory highlights the characteristics of the secondary labour market to cause poverty as opposed to individual characteristics. The existence of dual labour market is an indication of labour market dysfunction which is not perfectly functioning. Therefore, belonging to the lowest class in society and being stratified into the secondary labour market, predisposes one to poverty. To reduce poverty in a Marxist-like economy may not in principle require increasing public expenditure but will require intervention by regulation of the labour market which would set a minimum wage, aim to enhance working conditions and enhance the representation of workers in unions.

2.1.4 Theory of Social Exclusion and Social Capital

Social sciences have identified poverty to be exacerbated due to social exclusion and lack of social capital inherent in the structural characteristics of society. Social exclusion occurs when an individual or a community is wholly or partially excluded from full participation in the society in which they live. Davis and Sanchez-Martinez (2014) as cited in Morazes and Pintak (2007) note that regarding poverty, consensus on exclusion as non-participation in consumption, production and political engagement. Socially excluded individuals and communities fail to access opportunities and resources that are necessary to improve their economic welfare. One form of social exclusion may lead to another form of exclusion resulting to multiple permanent disadvantages (Sameti, Esfahani, & Haghighi, 2012).

Social exclusion is defined in terms of relative position to the rest of the society and generally applies to developed countries unlike in developing countries where most people are excluded in one dimension or another (Davis & Sanchez-Martinez, 2014). Social exclusion has been seen to be determined by social capital held

whereby social capital relates to one's social position and connections. Sirovatka and Mares (2008) summarise various definition of social capital 'as a quality, as a social resource or a social glue that is the property of a group, a community or a society, and as such it is available to its members.' Low levels of social capital worsen the possibility that one can climb out of poverty and reinforces unemployment and economic distress among low income earners. Policy interventions based on theories of social exclusion and social capital have been derailed due the difficulty in measuring the two aspects. However, studies that have been done on social exclusion have used a proxy of median income in which falling below a population income median; one is regarded as poor and excluded. Intervention through expansion of public expenditure and provision of public goods would be expected to provide a form of bridging to rest of the society particularly investment in social welfare.

2.2 Conceptual Framework

The conceptual framework for study has been developed to show the relationship between the selected variables. Figure 2.1 of the conceptual framework shows the dependent variable as Private consumption per capita as a measure of poverty and independent variables as education sector expenditure, health sector expenditure, agriculture sector expenditure and infrastructure sector expenditure.

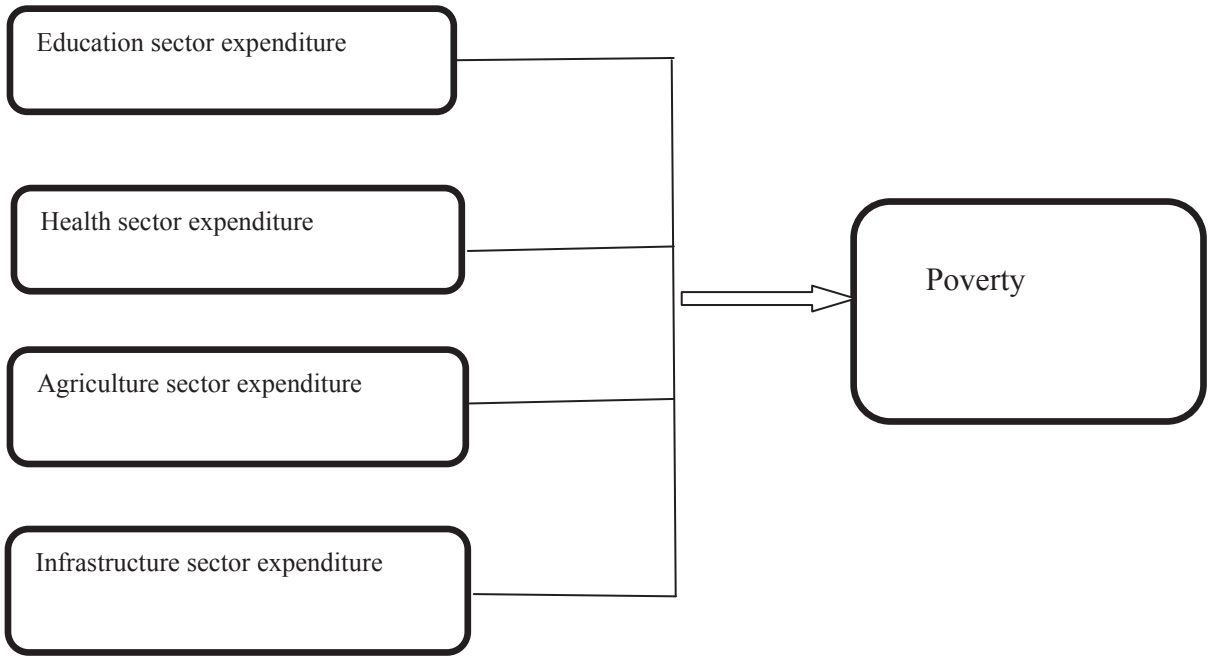

Figure 2.1: Conceptual framework of the study

2.3 Empirical Literature

2.3.1 Poverty

Studies on poverty date centuries back with the sole aim of understanding the nature of poverty and the optimal way to relieve poverty. Poverty has evolved over those centuries to a multi-dimensional nature necessitating different definitions and measurements. Different studies have applied different definitions, measurement and sources of data in yielding their results whose policy implications are varied. The implication is that comparing the results of the studies may be difficult and doing cross country studies becomes even more difficult. Sources of data for poverty pose altogether a different challenge given that data could be obtained from national accounts or household surveys of which could result to divergent conclusions. Household surveys as a source of data pose their specific challenge because they are conducted periodically therefore data may not be available for every year and are subject to sampling and non-sampling errors and incomes are usually underestimated. Nevertheless, the results and conclusions from these studies have continually provided a framework for further research work in the area including this study and informed much need policy formulation in the fight against poverty.

Empirical work on poverty has shown that steady economic growth to be the main engine to reduce poverty. Son and Kakwani (2004) cite study findings by Ravallion and Chen (1997) in which they studied sixty-two developing countries and found that on average, a one percent increase in per capita income caused a 3.1 percent reduction in the proportion of people living below the conventional $1 a day threshold. Dollar and Kraay (2002) studied the relationship between growth in average income of the poor and growth in overall average income using samples from both developed and developing countries whose data spanned four decades. They define the poor as the bottom fifth in the income distribution. The regression of the logarithm of per capita income of the poorest quintile on the logarithm of average per capita incomes showed a strong positive linear relationship within countries. Their study could have suffered from measurement error given instances of unbalanced and irregularly spaced panel observations. Ravallion (2013) projects that global poverty rate would decline to 3 per cent by 2027 three year earlier based on the World Bank target if the developing world maintains the current pace of growth and poverty reduction. Yoshida, Uematsu and Sobrado (2014) carried out a decomposition analysis that includes more realistic assumptions and found that the world average growth rate of 4.7 per cent can deliver poverty rate of below 3 per cent by 2030. Due to large cross country variation in the growth of household expenditure per capita, variation in population growth rate across countries and increasing within-country inequality, the pace of poverty reduction will reduce making it difficult to attain the target.

Country specific studies show that the response of poverty reduction due economic growth varies and in some studies the poor have not shared in the growth of the economy (see for example Parel, 2014; Sarke, 2009). The relationship between poverty and growth within country is influenced by the average level of income and the degree of inequality of its distribution (Santarelli & Figini, 2002). Yoshida et al. (2014) concluded that to end extreme poverty will require more than accelerating growth; the growth will need to be shared between the rich and the poor within countries and also between the rich and the poor countries. Kabubo-Mariara, Mwabu and Ndeng'e (2013) using the Ravallion-Datt-Shapley approach to decompose changes in poverty into growth and redistribution components for Kenya established that economic growth in Kenya is not always accompanied by poverty reduction. Therefore, direct intervention would be more effective in poverty reduction efforts.

Direct intervention approach towards poverty alleviation would require understanding factors that play to exacerbate poverty in the country. In a study of determinants of poverty in Kenya, Geda, Jong, Mwabu and Kimenyi (2001) using 1994 household level data collected in the Welfare Monitoring Survey and applying binomial and polychotomous logistics models found poverty to be more prevalent in rural areas that urban areas. The study found that male headed households are less likely to poor compared female headed which comprise about 30 per cent; people living in households mainly engaged agricultural activities were more likely to be poor and poverty is most influenced by the level of education. Both models exhibited similar results with differing magnitude of coefficients. The binomial model was run separately for rural areas and urban areas and it was found that for both urban and rural areas, level of education, household size and engagement in agricultural activities are strongly associated with poverty. However, the sizes of coefficients for regressor for urban areas were smaller than the rural areas. The shortcomings of this study are derived from the limitation in using household survey data due to sampling and non-sampling errors and lack of control for seasonality in household expenditure.

Poverty dynamics i.e. defining falling into poverty or rising out of poverty, in Kenya are determined by various factors which are pegged on the sources of livelihood for a household. Janson, Mango, Krishna, Rademy and Johnson (2009) used the asset based approach and participatory methodology at household and community level to study poverty dynamics in Kenya by use of both qualitative and quantitative data that went back fifteen years. The study found the most significant way to escape poverty is through diversification of income sources either by running a small enterprise like petty trading or by obtaining a second job mostly in the informal sector. Formal sector employment as means of escaping poverty accounted for 28 per cent of household sampled. Crop diversification and commercialization were vital in escaping poverty; for high potential zones and agro pastoral areas which experience reliable rainfall increasing land under cultivation and crop intensification aided the escape out of poverty. A third of the household that escaped poverty did so via livestock related strategies specifically livestock diversification and commercialization. Assistance from family and friends in terms of help with getting a job, providing education or school fees, assistance with housing, providing capital for opening/operating a business, and direct remittances and inheritance helped some households escape poverty.

Janson et al. (2009) also from their study compiled reasons that caused descent into poverty and top most being poor health of a family member which reduces productivity and the mounting health expenses. Citing a similar study by Barret et al. (2006) covering Kenya and Madagascar, it was noted that health shocks unrelated to nutrition were the main reason people became and stayed poor. Drought and death of livestock and loss of crops

due to drought and diseases aided descent into poverty. Land subdivision in some areas were responsible for making households fall into poverty. Land subdivision resulted to small uneconomic land holdings which are depleted off soil fertility and thus could not be relied for subsistence cultivation. The study further identified 41 per cent of all descent into poverty was due to a high dependency ratio. Total dependence in Kenya is 0.87 of which the urban dependency ratio is 0.63 and the rural 1.01. Insecurity and theft of property through tribal clashes and cattle rustling especially for pastoral communities have been responsible for causing some households to fall into poverty. These reasons for both falling into and escaping out of poverty differ across the country, a fact that aggregate national level cannot reveal. These studies emphasize that poverty eradication should take place through sectoral intervention. Kiringai and Levin (2008) analysis shows increased budgetary allocation is required in which some sector will require more to achieve MDGs for Kenya poverty being goal one and achieving one goal has a reinforcing effect in achieving the others.

2.3.2 Agriculture Sector Expenditure and Poverty

Studies have shown that the poor in Kenya engage mainly in agricultural activities and poverty is more prevalent in rural areas where the main source of livelihood is agriculture. These studies like those cited in the previous section have recommended investment in agriculture by government in order to stem poverty. Increasing productivity or accelerating growth in agriculture has been associated with poverty reduction because it has the direct impact of raising the nominal incomes of the poor through employment creation and real incomes of the poor through reduced food prices that comprise the largest portion of the poor's budget. Mendali and Gunter (2013) studied the impact of agricultural productivity on poverty reduction in developing countries and found that changes in agricultural total factor productivity has a positive significant impact on poverty reduction in general. The study estimated a cross section regression model to investigate the impact of changes in agricultural total factor productivity in a multioutput-multiinput framework for a pool of 113 developing countries. When the countries were grouped according to the level of income, the study found that agricultural total factor productivity did not have a significant impact of poverty reduction. This is consistent with Dollar and Kraay (2002) early findings of a positive relationship between agricultural productivity with income of the poorest quintile but insignificant. The study by Mendali and Gunter (2013) also does not provide adequate evidence that agriculture would result to significant poverty reduction since only 12 percent of the poverty reduction can be explained by changes in agricultural total factor productivity.

A study by Oni (2014) provide empirical evidence that agriculture enhances poverty reduction. The study found out that per capita agriculture to have a positive significant relationship with poverty reduction for Nigeria; one unit increase in per capita agricultural GDP would generate about 2763 per cent increase in poverty reduction. Poverty reduction had a negative but insignificant relationship with non-agricultural GDP. However, the study does not explicitly specify the measure of poverty reduction used as the independent variable apart from stating it comprises both income and non-income dimensions making comparison difficult. Thurlow, Kiringai and Gautam (2007) and Christiaensen, Demery and Kuhl (2012) note that the contribution of a sector to poverty reduction depends on the sector's own direct growth, the indirect growth arising from spillover sector linkages; the participation by the poor in that sector, reflecting the responsiveness of overall poverty to the sector of origin of GDP growth; and the relative size of the sector in the economy.

Christiaensen et al (2012) simulated the marginal effect on total poverty of one per cent growth in agricultural GDP per capita and one per cent growth in non-agricultural GDP per capita across a series of settings and for different poverty measures to quantify the overall poverty-reducing impacts of agriculture and non-agriculture sectors. The simulation results showed that agriculture has most marginal effect on poverty reduction in all settings i.e. middle income countries, low income countries excluding SSA and low income countries of SSA; among the poorest of the poor with the highest impact in SSA where it was more than eleven times more poverty reducing. Non agriculture is more effective in reducing poverty among the better off poor in resource poor countries. An earlier study by Thurlow et al. (2007) applied dynamic Computable General Equilibrium (CGE) micro simulation model to analyse growth and distributional changes in Kenya. Without taking the cost of accelerating growth in the different sectors, the impact of sectoral growth on poverty reduction and inequality is analysed using three scenarios. A baseline scenario, a scenario which compares poverty reduction due to agricultural and industrial growth and a scenario that examines the agriculture sector and estimates the poverty reducing impact of accelerating growth in the sector. From the micro simulation, a faster agricultural growth in the agriculture-led scenario results to rising income and expenditure for those in extreme poverty with most effect being felt by the rural poorest. On the other hand faster, non-food manufacturing growth in the formal and informal sectors under the industry-led scenario has most impact in reducing poverty in the less-poor

households. It was also found that agriculture had larger income multipliers that created more jobs and raised incomes and its economy wide linkages were more pro poor.

Empirical evidence that show that agriculture plays a critical role in poverty reduction, has led to calls for government to spend and invest in the sector to increase its total factor productivity. Geda et al. (2001) found that being employed in the agriculture sector increased probability of being poor and concluded that investing in the sector would be vital in reducing poverty in Kenya. Janson et al. (2009) established crop and livestock diversification and commercialization of agriculture played a role in help some households escape poverty while other households fell into poverty due to crop loss or livestock death due to drought and diseases. Policy action to be called for is increased investment through for instance offering extension services, reducing cost of inputs and increasing market access and fair play for peasant farmers to improve their incomes. In studying the effect of increasing budget allocation to agriculture, increasing agriculture spending by 10 per cent as per Maputo Declaration, would lift 1.5 million people out of poverty as defined by the poverty line by 2015 (Thurlow et al, 2007). The simulation was carried on increasing spending specifically in research and extension services and irrigation and it was found that increasing spending research and extension service was both pro poor and pro-growth. Increasing spending on irrigation was more beneficial in poverty reduction in the lowlands. The 10 percent increase in agriculture was found not be adequate to meet the expected growth in agriculture and to meet the MDG poverty by 2015. Therefore, increased spending on agriculture coupled with non-agricultural investments that are pro poor would be essential.

2.3.3 Health Sector Expenditure and Poverty

In the study to find out changes in income of the poorest quintile as result of per capita income changes, Dollar and Kraay (2002) found that social spending on health and education not to be significantly related to economic growth which is positively related to changes in income of the poorest. Dollar and Kraay note that social spending on health and education if effective and well-targeted to the poor may increase incomes of the poor despite their findings. The study explains that social spending on health and education in most developing countries, mainly benefit the middle class and the rich. In investigating the relationship between poverty and social spending, health and education are lumped together in most studies. However, a lot of empirical work has been done on the relationship between poverty and education and education spending compared to the relationship with health care and health care spending. In this study the effect of education and health spending through public spending allocation to the sector on poverty is investigated.

Janson et al. (2009) found that more households fell in to poverty due to poor health than those that that escaped poverty through employment due to formal education. Specifically 40 per cent of households sampled across Kenya fell into poverty due to poor health and debilitating health care expenses. Moreover, having an education did not guarantee employment in the formal sector. The income of the poor is very vulnerable to shocks and these shocks among them drought, political instability, economic shocks like high inflation and health related shocks drastically affect incomes of the poor and may have insufficient or no means of smoothing their consumption.

The poor in most low income countries cannot afford health care nor access social health protection through universal health care because is insufficient and very constrained. Scheil-Adlung et al. (2006) conducted a comparative analysis on the impact of social health protection on access to health care, health expenditure and impoverishment for South Africa, Senegal and Kenya using 2003 household survey data. The health insurance coverage is low in these countries with South Africa having 12.3 per cent of population covered, Kenya the coverage is 9.1 per cent and Senegal 4.2 per cent and in all the three countries the lower income group has very few people covered. Applying a multiple logistics regression, the study established that insured households in Senegal are less likely to face catastrophic expenditure i.e. medical expenditure equal to or exceeding 40 per cent of a household's non-subsistence spending; than the uninsured. In South Africa catastrophic expenditure was prevented for the richest quintile while for Kenya there was no significant impact given the national health insurance caters mainly for the formally employed.

For all the three countries residence in a rural area where most poor reside increases likelihood of catastrophic expenditure. In Senegal children less than five years are more likely to face catastrophic expenditure while in Kenya that was not the case due free medical services for children under five years. Across the three countries the likelihood of descending into poverty due medical expenditure is between 1.5 per cent and 5.4 per cent of the households. The study also found that health related expenditure widens the poverty gap; in South Africa the poverty gap increased from 37 per cent of the poverty line to 41 per cent; in Kenya it increased from 25 per cent

to 27 per cent; and in Senegal it increased from 54 per cent to 64 per cent. The study provides evidence that the poor need to be shielded from health shocks and investment in social health protection reduces impoverishment. However, the limitation with this study is that it used data from household surveys that were conducted using different instrument thus affecting comparability.

The effect of a health shock i.e. illness, onset of disability and death of an income earning member of a household; reduce labour productivity, labour hours and increase out-of-pocket health and funeral expenses thus reducing consumption and non-medical expenditures. Bales (2013) investigated the impact of ill health on labour supply, earned income, health expenditures and consumption and coping through adjustment to household asset holdings and unearned income by use of fixed effect poisson regression for Vietnam. Bales found that illness reduced significantly labour days of households faced with illness and had insurance and households faced with onset of disability. However, the wage income for these households was not affected by reduced labour days. On the other hand, health shocks had significant effects on out-of-pocket health spending due to illness and disability, of which it was lower for households with health insurance. Household consumption per capita for food and non-food items remained at the same level implying a coping mechanism. Households smoothed consumption by borrowing, transfers, dis-saving and sale of assets. Reduced labour supply due to onset of disability significantly affected the poor. According to the study findings, the poor self-employed non-farm income was negatively affected by illness to uninsured adult and onset of disability, but positively affected by the death of an adult in the household possible due to adjustment to health shocks.

The study by Bales for Vietnam, while showing the importance of increasing population under health insurance coverage is crucial for mitigating the effects of health shocks especially among the uninsured poor; is based on household survey which is subject to sampling and non-sampling errors. Moreover, the findings may not hold for Kenya given different countries use different instruments to collect data and question items administered to households differ. In finding the impact of health shocks on the least income quintile, the level of government expenditure allocation to the health sector is informed. The findings would also be crucial in targeting health investments.

Asghar, Hussain and Rehman (2012) studied the long run impact of government spending in various sectors on poverty reduction in Pakistan for the period of 1972-2008 applying co-integration and Error Correction Mechanism (ECM). Poverty as the dependent variable was measured using headcount index while the independent variables were: government spending on health government spending on education; government spending on law; order and government spending on economic and community service and budget deficit. The study found that the coefficient for government spending on health was insignificant. A similar study conducted for Lao PDR by Sourya, Sainasinh and Onphanhdala (2014) using panel regression analysis found domestic health funding to have a positive and significant coefficient meaning that poverty increased with spending on health sector. Foreign health funding was found to be insignificantly related to poverty. Awe (2013) and Osundina, Ebere and Osundina (2014)also examined the effect of government health expenditure on poverty in Nigeria using co-integtration analysis of time series data and a case study applying chi-square respectively. Awe (2013) found expenditure on health to have a significant and positive impact on poverty reduction while for Osundina et al. (2014) found expenditure on health to be insignificant to poverty reduction. The results from these studies maybe different due scope, choice of variables and research methodologies but are still crucial in informing this study.

2.3.4 *Education Sector Expenditure and Poverty*

Different measures of education have been used in empirical studies to show level of the human stock. Among the variables used are years of schooling differentiated for both primary and secondary education; gross and net enrolment for both primary and secondary; literacy level and highest level of schooling. Illiteracy and lack of formal education by themselves are indicators of poverty or a higher probability of falling into poverty. Choice of measure of the education variable is likely to influence the findings of a given study. Education is said to affect poverty directly through increasing wages and increasing chances of employment. Janson et al. (2009) established that in 28 per cent of the household that escaped poverty, education played a vital role in getting a job. Education increases the value and efficiency of the labour force thus the higher the education level of the labour force the lower the expected number of the poor in that economy. For this reason, studies have recommended increased investment in the education. Dollar and Kraay (2002) found that secondary education positively and significantly related to economic growth while primary education to have a positive but insignificant relationship with economic growth. Their study recommends that increasing school primary

enrollment among poor society would still influence the extent to which the poor can participate in growth through income distribution. In Kenya, the level of education is the most influencer of poverty (Geda et al, 2001) and since a female headed household is more likely to be poor; investment in female education is recommended to reduce poverty and increase productivity.

By use of panel data for forty developing countries, Janjua and Kamal (2011) conducted a cross country analysis using random effect generalized least square technique to find out the impact of education, growth and inequality on poverty. The study uses poverty headcount as the independent variable and dependent variables used are per capita GNP growth, gini index as a measure of inequality and net enrolment for formal secondary school as a measure of education level. Per capita GNP growth is found to have a significant inverse relationship with poverty while income inequality does not contribute to poverty reduction. The study found that education related coefficient to be dominant and negative in terms of magnitute and strongly significant thus formal education has a significant effect on poverty reduction for the whole sample. When the countries were grouped according to income, the low income countries portrayed that education was most significant in poverty reduction among the pooled samples i.e. lower income, lower middle income and upper income countries. Given the model was able to explain 96 percent variation in poverty head count, these findings provide evidence of the role of education in poverty alleviation.

In a study relating to the United States, Weber, Marre, Fisher, Gibbs and Cromartie (2007) found that education had a very strong direct effect on the likelihood of being poor. Applying a probit model on the Panel Study of Income Dynamics (PSID) dataset of 1993 and 1999 focusing on a sub sample consisting of 708 household heads of ages 25-64; they found the education coefficient to be highly significant and marginal effects estimates imply that an additional year of schooling reduces the likelihood of being poor by 39 per cent. Awan, Malik, Sarwar and Waqas (2011) conducted a similar study to investigate the impact of different education level, experience and gender on poverty for Pakistan using logistics regression with probability of being poor. The dependent variable is dichotomous in which being poor and non-poor are assigned dummy variables. The results of the study are interpreted using the odd ratios in the logistic regression and it was found that the odd ratios of all variables were less than zero meaning all the educational levels, experience and gender has a negative relationship with the poverty status of the employed individuals. The highest education level i.e. professional has a 57.5 per cent probability of being poor while the lowest education level i.e. matriculation has 99.4 per cent probability of being poor. It was also found that being male reduced the chance of being poor by 93.7 per cent in 1998-99 and this rose to 94.6 per cent in 2012. Thus, the study provides evidence that the higher the education level the less likely is one classified as being poor i.e. their income is not in the lowest quintile. However, the study does not examine the significance of these variables in explaining the probability of being poor.

In the study conducted by Asghar et al. (2012), the impact of government expenditure on education on poverty was found to be negative and significant. These findings are consistent with those of Awe (2013) in his case study of the Ekiti State of Nigeria. Osundina et al. (2014) found that government spending on education in Nigeria to be positively related to poverty reduction but relationship to be insignificant which was against their priori expectation. Sourya et al. (2014) differentiated the source of financing for education when studying its effect on poverty. They found that the education expenditure financed by domestic budget resulted to significant reduction of poverty in Lao PDR while education expenditure financed by foreign aid did not result to significant reduction in poverty. Apart from the study by Osundina et al. (2014), all other studies conclude generally that increasing allocation to the education sector would enhance poverty alleviation.

In an analysis of how Kenya can achieve the MDGs from a baseline scenario, the results show that an efficient and optimal allocation of public expenditures play a key role on whether the MDGs will be achieved by 2015 (Kiringai & Levin, 2008). The study concludes that investment through higher budgetary allocation to the education sector needs to increase and even a further increase on higher education level is required. Due to the economy wide implication of MDGs, it is expected that education will influence the composition of the labour force by raising its average educational level thus increasing labour productivity; incomes will be expected to increase also and the general economy performance is expected to improve. The total effect would be to accelerate the achievement of MDGs including eradication of extreme poverty.

2.3.5 Infrastructure Sector Expenditure and Poverty

Infrastructure takes a broad definition to include both physical and social infrastructure and the role of infrastructure is that of facilitation and enabling of other activities and providing access. In the context of this paper infrastructure refers to physical infrastructure which also has a wide coverage and whose reference may

include but not limited to transport, electricity, water, irrigation, drainage systems and telecommunication. Various studies in establishing the effect of physical infrastructure on growth and thus poverty, use variables mainly of one infrastructure phenomenon. The findings are still significant in providing piecemeal effects of various forms of physical infrasrtucture on poverty reduction. It should be noted until recently the role of infrastructure on poverty reduction was not much considered and thus not much studied.

Seetanah, Ramessur and Rojid (2009) conducted a study to answer whether transport and communication infrastructure alleviated urban poverty in developing countries. The study covers twenty developing countries and uses panel data for years 1980-2005. From running a cross section regression, length of paved road was found to be statistically significant and negatively related to poverty head count ratio. Fixed telephone line per 1000 people is used as a measure of communication infrastructure and is found to negatively relate to poverty headcount ratio but not significantly. Thus, infrastructure is seen to increase participation by the poor in economic activities and increase access for the poor to more economic activities. Moreover, infrastructure investment increases economic growth and number of jobs available for the poor. However, no clear explanation for the choice of regressors used in the study; the study takes various variables shown by research to determine poverty and includes length of paved road and fixed telephone line per 1000 people as proxies for infrastructure. Due to the large number of independent variables, the study uses three regression models of which all have similar findings. Further a dynamic panel analysis is conducted to mitigate the problem of endogeneity and control for lagged and feedback effects. The findings from the dynamic panel analysis are consistent with those of fixed effect model i.e. that road infrastructure is pro-poor in the sample of countries even in the short run. However, causality test shows existence of reverse causation from poverty to infrastructure which may be explained by the factor that countries with low per capita income have fewer funds for infrastructure investment.

Ogun (2010) estimated Impulse Responsive Function (IRFs) from Structural Autoregressive (SVAR) model and found that infrastructure investment causes growth consequently leading to poverty reduction in Nigeria. Infrastructure investment includes both physical and social infrastructure investment whose proxies were real capital expenditure on economic services and real capital expenditure on social and community services respectively. The other independent variables were growth measured as real GDP growth and governance whose proxy was fiscal discipline captured by the level of fiscal deficit. Real consumption expenditure per capita was used as a proxy measure of poverty which was the dependent variable. However, forecast error variance decomposition shows that investment in social infrastructure has greater potential to reduce poverty than investment in physical infrastructure in Nigeria. The findings of this study may hold or not hold for other countries, but generally it can be conclude that physical infrastructure investment contributes to poverty reduction.

In studying the effects of road infrastructure on poverty eradication in rural China, Jie, by applying a regression model, found that road infrastructure has a significant influence in poverty reduction in rural China. Road infrastructure was proxied by *roadpass* which took binary value whereby if a village had at least a tarmacked road the value would be 1; otherwise if no road was tarmacked in whole village the value would be 0. The study found that for villages with at least a paved road are expected to have an average income of 6.86 per cent higher than villages with not a single paved road. Net per capita income of a village was used as a proxy measure for poverty which is the dependent variable. Besides the *roadpass* independent variable, other independent variables were used to act as control variables i.e. illiteracy, number of clinic in a village, distance to water point, level of non-farm income and level of marketization in a village. While the study provides evidence for road infrastructure investment in rural areas, it suffers a number of limitations. The study admits not being able to capture all variables that can influence per capita income of a village; and some variables that were collated through data collected through questionnaires lack full accuracy. By further running a multiple regression using ordinary least square (OLS) estimator, Jie found that other infrastructure investment such as electricity networks and irrigation system positively influenced the per capita incomes of the villages sampled and thus contributed to poverty reduction.

The main objective of the study by Osundina et al. (2014) was to examine the relationship between government spending on infrastructure and poverty reduction in Nigeria. Per capita income was used a proxy measure of poverty reduction. The expenditure on infrastructure was disaggregated into government spending on building and construction and government spending on road transport. The study found that in government spending on building and construction to be positively and significantly related to poverty reduction while government spending on road transport to negatively and significantly related to poverty reduction. In the earlier study by Awe (2013) where public spending on infrastructure had a wide scope to include road network, access to electricity and water and public utilities. The study found that public expenditure in infrastructure played a

significant role in reducing poverty in Ekiti State. Sourya et al. (2014) found that both domestic and foreign expenditure on infrastructure did not have a significant impact in reducing poverty in Lao PDR. They explain this may be due to skewed distribution of funds between rich and poor provinces.

Most studies on the impact of infrastructure deal with transport infrastructure and rarely other forms of infrastructure. Sawada, Shoji, Sugawara and Shinkai (2010) conducted a study using household-level monthly panel data collected over a period of two years to study the impact of irrigation infrastructure on poverty in Sri Lanka. From the point estimates, the study found that with irrigation accessibility, per capita income, per capita food and per capita non-food consumption expenditures increase by around 17.8 per cent, 12.2 per cent and 37.6 per cent respectively for the study area. This provides evidence that irrigation infrastructure influences poverty reduction positively. These findings are consistent with those of Thurlow et al. (2007) whereby simulation analysis shows that poverty declines by an additional 1.8 percentage points in an irrigation scenario for Kenya with most poverty reduction taking place in the rural areas.

In Kenya there are not many studies in relation to the effect of physical infrastructure on poverty. Thurlow et al. (2007) introduced an increase in government spending in rural feeder roads in their micro simulation model for analysing growth and distributional changes in Kenya. In a scenario where road expenditures in government spending increase by 2.7 percent, national poverty declines by 2 percent. This study will thus bridge the existing gap in literature as in regard to the effect of increasing government spending in physical infrastructure.

2.4 Summary of Literature Review and Research Gap

The theoretical literature review has shown that there are different schools of thought on the involvement of government in the fight against poverty. The empirical literature has provided studies and their findings that have been done where the impact of government expenditure on poverty has been investigated. These studies have various scopes; some being country studies, others cross country and other case studies. Sources of data are also varied from primary data to secondary data and further, the methodologies applied for the studies are varied. Choice of the poverty variables was different across the studies. Most studies found that government spending in health, education, agriculture and infrastructure sectors to have a significant effect on poverty. The findings of these study may not apply to Kenya as carried out. Further, no particular study has been done to specifically study the impact of government expenditure in various sectors on poverty in Kenya. Therefore, this study aims to bridge this research gap and provide findings that are useful in evaluating the policy option in the fight against poverty in the country.

3. Research Methodology

3.1 Research Design

The research design in this study is a diagnostic research study design with a quantitative approach which involves an investigation of association among variables. Both descriptive and explanatory designs were adopted for the study. The diagnostic research design was most preferred because the study aimed to investigate the impact of government sectoral expenditure allocation on poverty in Kenya. Firstly, the evolution in the sectoral expenditure allocations was described. Secondly, an explanatory approach was taken to explain whether sectoral expenditure had any effect on poverty and causal research objectives of the study were test.

The independent variable is the presumed to have an association with the dependent variable. In the context of this study, private consumption per capita was the dependent variable used as a measure of poverty while agriculture, infrastructure, health and education sector budgetary allocations were the independent variables.

3.2 Target Population

The study population consisted of annual observations of poverty level and agriculture, infrastructure, health and education sector expenditure allocations for years covering period 1964-2010 for Kenya. The study used time series econometric data.

3.3 Data Collection

Secondary data was used in the study which was collected from the Kenya National Bureau of Statistics.

3.4 Data Analysis

The study used both the descriptive and inferential statistics in analysing the data. Regression analysis was used to test the dependence relationship between the dependent variable and the independent variables. The data was analysed with the help of data analysis software specifically E-views 7 to generate a regression model of the variables given herein. The results of data analysis will be presented by of graphs, equations and tables.

3.5 Model Estimation

Government spending through allocation and composition to various sectors and programmes has the objective of growth and poverty reduction (Wilhelm & Fiestas, 2005). The outcomes of government spending such as literacy rates, infant mortality rates, access to road and healthcare, agricultural productivity etc. lead to economic growth and poverty reduction. The model followed the Keynesian framework in which an increase in government expenditure results to increased consumption and economic growth thus leading to poverty reduction. Using the expenditure allocation framework of Ferroni and Kanbur as modified by Paternostro, Rajaram and Tiongson (2005) in which allocations seek to maximise the welfare effect; the level and composition of public spending affects basic social indicators, poverty incidence and national income. In the framework poverty (P) is a function of expenditure allocation to social sector(S), infrastructure sector (K), other sectors (O) and national income (Y) i.e

$$P = f(S, K, O, Y) \quad \text{.....Equation 3.1}$$

The functional relationship defined for this study is as follows:

$$\text{Poverty} = f(\text{Sectoral Expenditure Allocation}) \quad \text{..... Equation 3.2}$$

The study used private consumption per capita, a poverty measure, as the dependent variable as also used by Ogun (2010). The independent variables were agriculture, infrastructure, health and education sector expenditures, each as a ratio of total government expenditure to control for level of public spending. Table 3.1 gives a description of each of the selected variable. The choice of the independent variables was informed by various studies which have shown that the poor interact most with these sectors. Moreover, these sectors are among the six Sector Working Groups (SWG) under the Medium Term Expenditure Framework (MTEF) that guide resource allocation based on strategic priorities. Particularly under the 2014/15-2016/17 MTEF these sectors form part of the key priorities areas for achievement of shared prosperity (Republic of Kenya, 2014).

Table 3.1 Description of Variables

Variable	Variable	Description
Dependent Variable	Poverty	The proxy measure for poverty is private consumption per capita.
Independent Variables	Agriculture Sector Expenditure	This comprises expenditure in agriculture, veterinary forestry, fishing, and hunting
	Education Sector Expenditure	This comprises expenditure in Pre-primary and primary education, secondary education, tertiary education and other education expenditure not classified elsewhere.
	Health Sector Expenditure	This comprises expenditure in outpatient services, hospital services, public services and health expenditure no classified elsewhere.
	Infrastructure sector Expenditure	This comprises expenditure in transport, communication, electricity, gas, steam and water

The estimated Ordinary Least Square (OLS) multiple linear regression model for this study took the following form:

$$PC = \beta_0 + \beta_1 {}^{AGR}/_{TGE} + \beta_2 {}^{HEA}/_{TGE} + \beta_3 \ {}^{EDU}/_{TGE} + \beta_4 {}^{INFR}/_{TGE} + \varepsilon_t \ldots\ldots \text{Equation 3.3}$$

Transforming *Equation 3.3* into natural log, the log linear form is as follows:

$$LN\_PC = \beta_0 + \beta_1 LN\_AGR + \beta_2 LN\_HEA + \beta_3 \text{LN\_ EDU} + \beta_4 LN\_INFR + \varepsilon_t \ldots\ldots\ldots \text{Equation 3.4}$$

Where:

PC = Private consumption per capita

AGR= Agriculture sector expenditure

HEA= Health sector expenditure

EDU= Education sector expenditure

INFR= Infrastructure sector expenditure

TGE = Total government expenditure

β_i are parameters and ε_t is the Error term.

Vector error correction model (VECM) was applied to established existence of short and long run relationships from sectoral expenditure allocations to private consumption per capita as a proxy measure of poverty. The general error correction model for this study is as follows:

$$\Delta LN\_PC_t = \beta_0 + \beta_1 \Delta LN\_AGR_t + \beta_2 \Delta LN\_HEA_t + \beta_3 \Delta LN\_EDU_t + \beta_4 \Delta LN\_INFR_t + ECM_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots \text{Equation 3.5}$$

3.6 Model Adequacy Testing

Before the VECM was run diagnostic tests including unit root test and co-integration test were done to ascertain stationarity, order of integration and possibility of long run causality of sectoral expenditure allocation on poverty in Kenya. The variables were first tested for unit root by use of Augmented Dickey-Fuller (ADF) test. Variables that are non-stationary invalidate hypotheses testing by use the t-statistic and F distribution. Variables found to be non-stationary were differenced appropriately. The descriptive statistic of the error term was generated to ensure that its probability distribution follows a normal distribution; its mean is approximately zero and that there is zero covariance between the error term and independent variables. Independent variables were tested for multi-collinearity by use of correlation coefficient generated by the E-views software. Durbin-Watson (DW) *d* test was applied to test for the presence of autocorrelation; the DW statistics is equal to two in the absence of auto correlation. Further, Breusch-Pagan Godfrey Test was used to test for heteroskedasticity facilitated by the E-views software. The R squared statistic was used to define whether the independent variables are useful in explaining variation in the dependent variable. The t-statistic was used to test the significance of the partial coefficients and the F-test was also applied to test the overall adequacy of the model. The expected result is that all independent variables have a positive effect on the dependent variable i.e. public spending in agriculture, health, education and infrastructure leads to reduction in poverty level in Kenya.

4. Research Findings

4.1 Preliminary Analysis

The OLS regression method makes certain assumptions about the dependent variables and the error term. These assumptions have to be fulfilled to obtain valid interpretation of the regression estimates. Diagnostic tests were done to ascertain that the assumptions were fulfilled and the results of the tests are given in the subsequent sections.

4.1.1 Descriptive Statistics

Time series data for each variable obtained was for the period covering 1964-2010. The nominal data series was converted to real values with 2009 being the base year i.e. 2009=100 before data analysis was carried out. Consumer Price Index (CPI) was used to convert private consumption data to real values while GDP deflator was used to convert sectoral expenditure allocation data. Figure 4.1 shows the evolution of sectoral government expenditure over time with expenditure in agriculture reducing over time and among the four sectors education received the highest allocation.

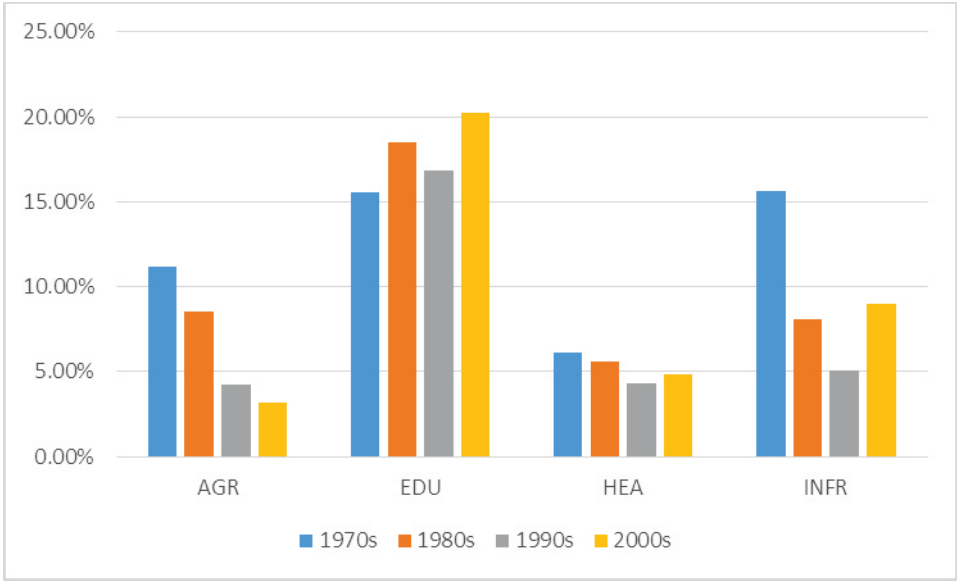

Figure 4.1: Evolution of Selected Sectoral government expenditure as Percentage of Total Expenditure in Kenya

Table 4.1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Max	Min	JB	P-value(JB)
LN_AGR	46	-0.0310	0.201	0.458	-0.665	3.915	0.14
LN_EDU	46	0.0157	0.120	0.363	-0.217	4.066	0.13
LN_HEA	46	0.0024	0.110	0.212	-0.341	6.061	0.05
LN_INFR	46	0.0084	0.266	0.844	-0.687	3.276	0.19
LN_PC	46	-0.0070	0.078	0.214	-0.260	15.445	0.0004

4.1.2 Test for Normality

The p values for the Jacque-Bera (JB) statistics for the explanatory variables in Table 4.1 show that the JB statistics is not significantly different from zero at 5 per cent level of significance. Therefore, the variables are normally distributed implying that they are uncorrelated and independently distributed.

4.1.3 Test for Multicollinearity

The use of OLS regression requires that there is no perfect multicollinearity among explanatory variables. Table 4.2 is a correlation matrix for the explanatory variables which shows all correlation coefficient to be less than 0.80. It is clear that there is no perfect nor severe multicollinearity among the explanatory variables.

Table 4.2: Test of Multicollinearity

	LN_AGR	LN_EDU	LN_HEA	LN_INFR
LN_AGR	1.000000			
LN_EDU	0.242407	1.000000		
LN_HEA	0.194081	0.534384	1.000000	
LN_INFR	0.199831	0.442809	0.307748	1.000000

4.1.4 Unit Root Testing

The variables were then subjected to unit root testing using the Augmented Dickey-Fuller (ADF) Test. The ADF test showed that all variables have unit roots i.e. were non stationary at level and became stationary after first differencing as shown in Table 4.3. A linear regression model with non-stationary variables gives spurious results. However, if the regression model results to residuals that are stationary the variables could be integrated.

Table 4.3: Unit root tests

	Level				First Difference			
Variable	ADF Value	Critical Value		Remarks	ADF Value	Critical Value		Remarks
		1%	5%			1%	5%	
LN_PC	-1.1884	-3.5812	-2.9266	Non stationary	-5.9569	-3.5847	-2.9281	Stationary
LN_AGR	-2.8290	-4.1705	-3.5107	Non stationary	-8.1547	-4.1756	-3.5131	Stationary
LN_HEA	-2.0855	-3.5812	-2.9266	Non stationary	-5.6346	-3.5925	-2.9314	Stationary
LN_EDU	-2.7351	-3.5812	-2.9266	Non stationary	-6.6467	-3.5847	-2.9281	Stationary
LN_INFR	-1.6147	-3.5812	-2.9266	Non stationary	-7.2407	-3.5847	-2.9281	Stationary

4.2 Co-integration and Vector Error Correction Mechanism

4.2.1 Testing for Co-integration

The OLS regression model was ran for *Equation 3.4* and the residuals series was found to be stationary at 5 per cent level of significance as shown in Table 4.4; an indication of presence co-integration. The variables were then tested for co-integration using the Johansen test of co-integration.

Table 4.4: Residual Unit Root Test

ADF Value	**5% Critical Value**	**P-Value**
-3.014	-2.9266	0.041

The lag length of 3 was selected by Vector Autoregressive (VAR) model using the sequential likelihood ratio (LR) test. In Table 4.5 both the trace test and Max Eigen test indicate presence of one co-integrating equation at 5 per cent level of significance. Therefore, the variables are integrated to order I(1). This is an indication of presence of long run equilibrium among the study variables.

Table 4.5: Johansen Test of Co-integration

		Trace		Max Eigen Statistic	
Number of Co-integration	**Hypothesis**	**Trace Statistic**	**5% critical value**	**Max statistic**	**5% critical value**
None	Ho; r=0, H1; r≥1	112.3175*	69.819	67.70857*	33.877
At most 1	Ho; r=1, H1; r≥2	44.60898	47.856	23.94142	27.584
At most 2	Ho; r=2, H1; r≥3	20.66756	29.797	11.94213	21.132
At most 3	Ho; r=3, H1; r≥4	8.725429	15.495	8.33356	14.265
At most 4	Ho; r=4, H1; r≥5	0.391869	3.841	0.391869	3.841

4.2.2 Vector Error Correction Mechanism

The presence of a long run equilibrium having been established, then in the short run the relationship among study variables may be characterized by disequilibrium. Vector Error Correction (VEC) Model which is a restricted VAR causes the endogenous variables to converge to their co-integrating equations while allowing a wide range of short-run movements. The error correction term (ECT) corrects gradually the deviation from long-run equilibrium through a series of partial short-run adjustments. The ECT is required to be negative and significant for adjustment to equilibrium to be attained. Running VEC model for this study resulted to co-integrating equation shown by Equation 4.1. When the OLS regression was run it was found that the model was adequate to explain the variation in the dependent variables as shown in Table 4.8. The R squared of 64.56 per cent is sufficient to explain variation in private consumption per capita, while other variables not included in the estimated model explain 35.44 per cent of the variation. Durbin Watson of 2.0476 implies absence of serial correlation of the error term and p-value of the F statistic being less than 5 per cent shows that the model is reliable in showing the relationship between sectoral government spending and poverty in Kenya. The residual diagnostic tests in Tables 4.6 show that error term, ε_t in Equation 3.5 is normally distributed, has no serial correlation and has no heteroskedasticity further confirming the model is a good fit for the study.

Table 4.6: Residual Diagnostic Tests

Test	**Chi-square /JB**	**P-value**	**Remarks**
Heteroskedasticity Test: Breusch-Pagan-Godfrey	18.9652	0.5214	No heterokesdaticity
Breusch-Godfrey: Serial Correlation LM Test	3.2376	0.3564	No serial correlation
Normality Test: Jacque Bera	0.0338	0.9833	Normally distributed error term

Table 4.7: Granger Causality Results based on VECM

Independent Variables						
Dependent Variable	χ^2 **-statistics of lagged 1st differenced term (p-value)**					**ECT_{t-1} coefficient [t-ratio]**
	ΔLN_PC	**ΔLN_AGR**	**ΔLN_EDU**	**ΔLN_HEA**	**ΔLN_INFR**	
ΔLN_PC	-	1.011 (0.799)	5.229 (0.156)	1.662 (0.646)	9.807** (0.020)	-0.239** [-3.175]
ΔLN_AGR	3.655 (0.301)	-	4.146 (0.246)	1.913 (0.591)	11.636*** (0.009)	0.529** [2.358]
ΔLN_EDU	4.941 (0.176)	0.172 (0.982)	-	7.306 (0.063)	5.435 (0.143)	0.001 [0.007]
ΔLN_HEA	10.428 (0.015)**	3.888 (0.274)	5.760 (0.124)	-	2.369 (0.499)	0.228 [1.958]
ΔLN_INFR	1.250 (0.741)	2.762 (0.430)	3.862 (0.277)	4.183 (0.242)	-	0.568 [1.606]

***Note**: *** and ** denotes significant at 1% and 5% significance level, respectively. The figure in the parenthesis (...) denote as p-value and the figure in the squared brackets [...] represent as t-statistic*

Table 4.7 shows that ECT is negative and significant confirming that there exists a stable long run causality from sectoral government expenditure to poverty at 5 per cent significance level. Private consumption per capita adjusts to government sectoral expenditures in health, education, agriculture and infrastructure with a lag and only about 23.9 per cent disequilibrium is corrected within a year.

$$LN\_PC = 14.8845 + 0.2700LN\_AGR - 0.0489LN\_EDU + 1.4518LN\_HEA - 0.4286LN\_INFR \quad \text{.....Equation 4.1}$$

Table 4.8: VECM Coefficients

Variables	**Coefficient**	**Standard Error**	**t-statistic**	**P-value**
LN_AGR	0.2700	0.0844	3.1986	0.001392
LN_EDU	-0.0489	0.2013	-0.2427	0.405041
LN_HEA	1.4518	0.4014	3.6170	0 .000432
LN_INFR	-0.4286	0.0937	-4.5663	0.000025

$R^2 = 0.6456$ DW=2.0476 F-statistic=2.9604 (p-value=0.006)

4.3 Discussion of Findings

The estimated long run equation given in Equation 4.1 shows that government expenditure on agriculture and health has a positive and significant effect on private consumption per capita thus leads to reduction of poverty level. This is consistent with priori expectation. Awe (2013) also found both public expenditure in agriculture and health to be significant for poverty reduction for Nigeria. A one per cent increase in government expenditure on agriculture and health leads to a 0.27 per cent and 1.45 per cent respectively increase in private consumption per capita. Studies by Mendali and Gunter (2013), Oni (2014) and Thurlow et al. (2007) found higher agricultural output led to increased poverty reduction and so support increased investment in agriculture like this study.

Government expenditure on education has an insignificant effect on private consumption thus on poverty level contrary to priori expectation. This may be explained by reduced access for post primary education for class eight candidates who are beneficiaries of Free Primary Education (FPE) program. Post primary education is more crucial in the fight against poverty as shown by studies by Dollar and Kraay (2002); Janjua and Kamal (2011); Weber et al. (2007); and Awan et al. (2011). Therefore, there is need to increase funding to secondary and tertiary education a concurrence of Kiringai and Levin's (2008) conclusion that higher budgetary allocation is required for higher education in Kenya. Government expenditure on infrastructure has a negative and significant effect on private consumption per capita and consequently on poverty reduction also contrary to priori expectation. A one per cent increase in government expenditure on infrastructure results to 0.42 per cent decrease in private consumption per capita implying increased level of poverty. However, in the short run there is a significant direct causation from government expenditure on infrastructure to private consumption per capita as shown in Table 4.7. This may be as a result of creation of many casual jobs during construction and setting up of the various infrastructure projects in the short run. In the long run the debt servicing burden may cause private consumption per capita to decrease since the infrastructure projects are financed by public debt. In some regions the poor may be having little access to infrastructure such good roads, water and electricity.

5. Conclusion

The main objective of this study was to investigate the effect of sectoral government expenditure on poverty level in Kenya. Private consumption per capita, a proxy measure for poverty reduction, was the independent variable while education sector expenditure, health sector expenditure, agriculture expenditure and infrastructure sector expenditure were the independent variable. Co-integration analysis and error correction mechanism were used to establish presence of long run and short run relationships among the study variables. The co-integrating order of variables was tested using ADF test and all variables were found to be integrated to I(1). The ECT for the VEC model was found to be negative and significant an indication of presence of a stable long run equilibrium. The study finds that the composition of government budget expenditure has an effect on poverty in Kenya. In particular public spending on agriculture and health sectors enhance poverty reduction as expected in theory. Both the coefficients of government expenditure on agriculture and government expenditure on health were found to be positive and significant to poverty reduction. Contrary to priori expectation government expenditure on education was found to have an insignificant relationship with poverty. This implies that the expected benefits of increasing employability and wage level provided by attaining formal education do not result to poverty reduction for Kenya. The coefficient for government expenditure on infrastructure was found to be negative and significant to poverty reduction also contrary to priori expectation. However, it was found in the short run government expenditure on infrastructure was significant to poverty reduction. This is an indication that in the long run infrastructural development may not be benefiting the most poor through increased participation in economic activities. The model was a good fit for the study and therefore is reliable in showing the effect of government sectoral expenditure on poverty reduction.

This study recommends that budget planning and execution should continue being pro-poor and pro-growth. In particular the government should increase its expenditure allocation to the agriculture sector and enhance an agriculture-led growth. To date the greatest contributor of GDP in Kenya is the agricultural sector and in the last five year contribution to the GDP by the sector averaged at 26.18 per cent (Republic of Kenya, 2015). The government should also increase allocation to the health sector since it would reduce out-of-pockect health expenses for the poor and enable them to resume productive activities. The newly revamped universal health care through the National Health Insurance Fund is a big step in the right direction.Government expenditure in education was not found to enhance poverty reduction however the government needs to invest in post primary education similar to FPE. Wilhelm & Fiestas (2005) noted low access of children from poor households to

secondary schools to the developing countries they studied. Public spending in infrastructure has not been found to be poverty reducing but the government should continue to invest in infrastructural development as a pro growth measure. Wilhelm & Fiestas (2005) also noted that investment in infrastructure to have a tendency to disproportionately benefit the richest segment of a country. This further makes the issue of poverty targeting for public expenditure a policy concern. Agénor, Bayraktar, & El Aynaoui (2005) indicates that public expenditure constitutes both in investment in "service" for example in education and health and investment in "growth" for example in infrastructure and agriculture. Therefore, it is crucial for governments to formulate a frame work for determining an optimal allocation of government budget expenditure across sectors and within sectors.

Pro-poor government expenditure in Kenya will lead to poverty reduction only if larger benefits accrue to the lower income earning quintiles. Therefore further research needs to be carried out in form of benefit incident analysis to clearly establish the ultimate beneficiaries of different expenditure components. Research in this area will also evaluate the efficiency and equity of budget allocations across sector and within sectors.

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