

Population Growth as a Cause of Human Development in Zambia 1992-2022

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Abstract: *This study set out to investigate population growth as a cause of human development in Zambia from 1992-2022. With substantive objectives being to investigate examine whether population growth causes; Income inequality, poverty and unemployment in Zambia. The study was built on two theories namely: the Malthusian theory of population and demographic transition theory. It employed a mixed research method utilizing both qualitative and quantitative data. Using the granger causality as the estimation technique specifically utilized the Vector Autoregressive (VAR) model and correlation tests, the results show that that population growth causes human development and poverty meaning that as population is increasing both human development and poverty are increasing. Further, showed that population growth does not cause income inequality and unemployment in Zambia. Meaning that, as population is increasing income inequality and unemployment are reducing. The study recommends that the government of the Republic of Zambia invests in Research, Development and Technology so as to be in touch with the needs of the people in order to make policies that speak to the current needs of the people. Equally, investing in education and health infrastructure and human resource as well as, be deliberate about setting up manufacturing industries and revamping already existing ones.*

Keywords: *Population, Human Development, Income Inequality, Poverty, Unemployment.*

1. INTRODUCTION

The relationship between population growth and Human development has always been a contentious one. This is so because, according to the United Nations estimates, the world is today living in an era of unprecedented population growth. Since the twentieth century, the world's population has almost tripled in size, reaching almost eight (8) billion people in 2022. With Africa's population being slightly above 1.4 billion making 16.72% of global population (World meter, 2023:1-10).

The United Nations Estimate suggests that the unprecedented growth of global population that has occurred since 1950 is as a result of two trends being experienced: firstly, the gradual increase in average human longevity due to widespread improvement of public health, nutrition, personal hygiene, medicine, knowledge and secondly, the consistence and persistence of high levels of fertility in many countries especially in lower and middle-income countries of which Zambia is one of them.

From the year 1960 to 2021 the population of Zambia has increased from 3.07 million to slightly above 19.47 million. This is a growth of 534.1% in 61 years. In the same period, a total of all countries worldwide increased by 160.2% (World Data, 2022: 5-19). This population growth has however, to some extent resulted into relatively poor progress in promoting ongoing human development as evidenced in decreased fiscal expenditure in health, education and social protection placing Zambia in the bottom quartile of the world's human development rankings-ranking 139th of 188 countries as of 2015. This is explicitly evident in the high unemployment, education and inequality rates of the country (Zambia Human Development Report, 2016: 1-10).

Furthermore, some studies conducted show that rapid population increase can however exacerbate the challenge of ensuring that future development is sustainable and inclusive especially in low and medium countries whilst some studies conducted have shown that human development in high-income countries is likely to be relatively slow in coming years, partly because population growth in these countries is anticipated to slow considerably (Peterson, 2017: 12-29).

Additionally, other studies show that population growth has been and will continue to be problematic as more people unavoidably use more of the finite resources available on earth especially in Africa, consequently reducing long-term potential growth. Population growth may or may not affect many aspects of a territory such as international migration, economic inequality, and the size of a country's work force. These factors both affect and are affected by overall economic growth (Milanovic, 2016: 20-29).

2. STATEMENT OF THE PROBLEM

Zambia remains one of the least developed countries in Africa with 54% of the population living on less than the poverty datum line that is 2.15 United States Dollars (\$) a day and an average life expectancy of 63.5 years. Furthermore, the country was ranked 143 out of 189 countries in the 2019 Human Development Index (World Bank,2020: 10-26).

According to World Bank, (2020: 10-26). Sub-Saharan Africa's population is growing at 4.7% per annum, with over 1.433 billion inhabitants. Zambia's population is averagely growing at 2.8% per annum. However, development seems farfetched as her population growth is not reflected in her development, even with the available human and natural resources. According to United Nations Conference on Trade and Development, (2021: 2-4). Zambia's Gross Domestic Product (GDP) is about \$20.2 million as opposed to China's whose population is slightly over 1.4billion with a GDP of \$27.2 trillion, inflation rate of 0.9% and unemployment rate of 5.2%.

Interesting to note that some studies have shown that population growth necessitates development and the case of China has been often times used to show the nexus. Population growth is undoubtedly a valuable human resource when strategically utilized it contributes to development and the attainment of the much-needed productivity. The case of China exemplifies how a large population has contributed to its development through prudent utilization of factors of production such as human labor, land and capital. However, the opposite is true when there is no direction and prudent exploitation and utilization of factors of production because then, a larger population calls for a need to increase public expenditure; which most economies have no capacity to do so. This exacerbates the already existing inequalities and challenges pertaining to unemployment, education, poverty among others. Therefore, there is need to investigate precisely population growth as a cause of human development in Zambia (World Bank, 2020:12- 15).

Additionally, very few studies have focused on the impact of population growth on human development and the focus has largely been on the Human Development Index, these indices are largely quantitative. This implies that there has not been a qualitative approach that factors in the experiences of the ordinary citizenry. This study will therefore, be a hybrid of qualitative and quantitative methods in order to investigate population growth as a cause of Human Development in Zambia.

The study will contribute significantly to the body of knowledge by investigating population growth as a cause of human development with a focus on Inequality, Poverty and Unemployment in Zambia.

2.1. Main Research Question

Does population growth cause Human development in Zambia?

2.2. Specific Research Questions

1. Does population growth cause Inequality in Zambia?
2. Does population growth cause poverty in Zambia?
3. Does population growth cause unemployment in Zambia?
4. **Main Objective**

To investigate whether population growth causes human development in Zambia.

2.3. Specific Objectives

1. To investigate whether population growth causes inequality in Zambia.
2. To examine whether population growth causes poverty in Zambia.
3. To investigate whether population growth causes unemployment in Zambia.

2.4. Hypotheses

1. a. Ho- There is no relationship between population growth and inequality in Zambia.
b. H1- There is a relationship between population growth and inequality in Zambia.
2. a. Ho- There is no correlation between population growth and poverty in Zambia.
b. H1- There is a strong correlation between population growth and poverty in Zambia.
3. a. Ho- there is no relationship between population growth and unemployment in Zambia.
b. H1. There is a relationship between population growth and unemployment in Zambia.

2.5. Definition of Key Terms

2.5.1. Human Development

According to United Nations Development Program Report, (2015: 5-12) Human development speaks to expanding the richness of human life, rather than simply the richness of the economy in which human beings live. It is an approach that is focused on creating fair opportunities and choices for all people. The human development approach, developed by the economist Mahub, is anchored in Amartya Sen's work on human capabilities, often framed in terms of whether people are able to "be" and "do" desirable things in

life (Robert, 1968: 1-5). Furthermore, Seer's work on development substantiates the term by speaking to three elements of development namely: poverty/undernourishment, inequality and unemployment. This is in relation to the fact that if these elements in a country reduce, the development is said to be inevitable (Seers, 1969: 2-7).

2.5.2. Inequality

Inequality is the state of not being equal, especially in status, rights, and opportunities, it is a concept very much at the heart of social justice theories. Inequality can be viewed from different perspectives, all of which are related. Most common metric is Income Inequality, which refers to the extent to which income is evenly distributed within a population. Inequality focuses on the distribution of attributes, such as income or consumption, across the population (International Monetary Fund, 2022: 2-4).

2.5.3. Population Growth

The increase in the number of human beings that are alive on the surface of the earth, it can be narrowed to express the increase in population size of a particular territory. It could result from more births, less deaths and an increase in the number of people migrating to that particular area (Birdsall & Sinding, 2001: 10-12).

Population growth rate describes the per capita rate of growth of a population as the factor by which population size increase per annum. Population growth rate is typically estimated using census, which then the rate is typically estimated using census data over time or from demographic-fecundity and survival data (Mburu & Ezech, 2017: 5-10).

2.5.4. Poverty

According to the World Bank (2000: 2-7), poverty is a multi-dimensional phenomenon, it is pronounced deprivation in wellbeing, where well-being can be measured by an individual possession of income, health, nutrition, education, assets, housing, and certain rights in a society such as freedom of speech. Also, poverty is a lack of opportunities, powerlessness, and vulnerability.

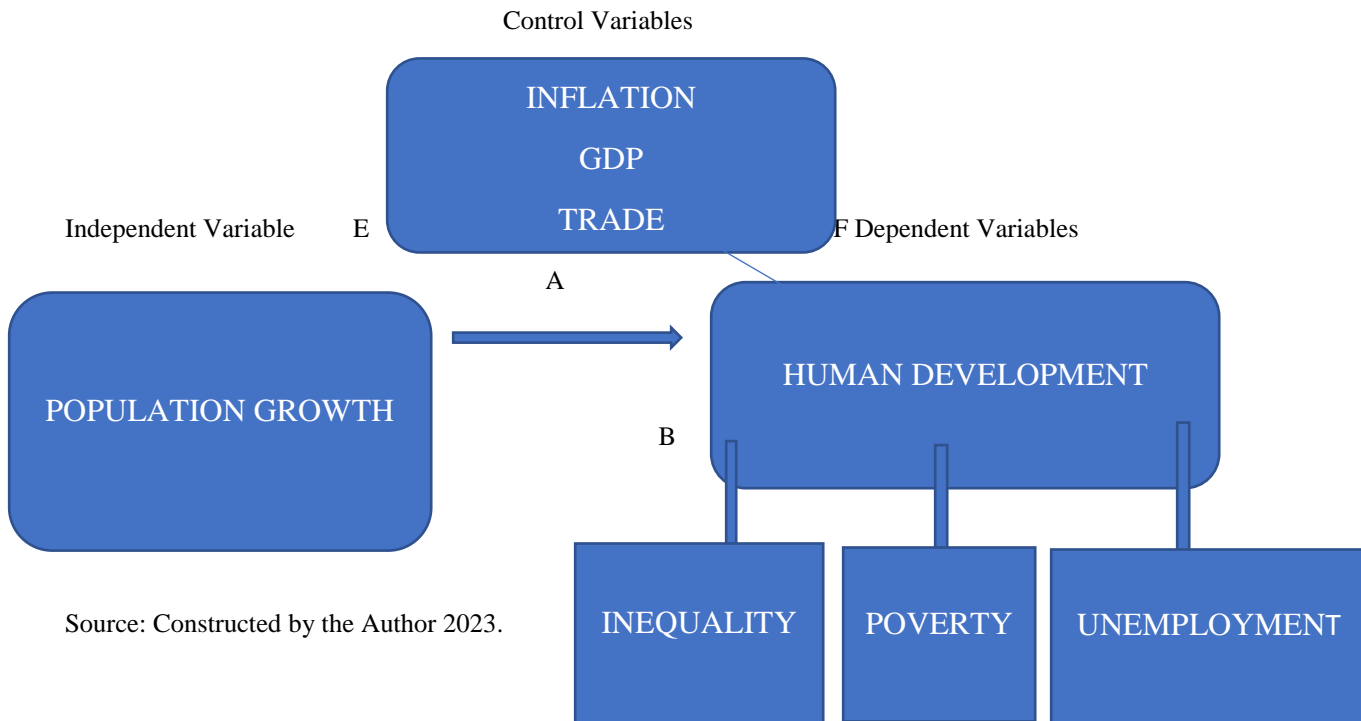
Furthermore, Poverty is the inability of a country, households or individuals have enough resources or abilities to meet their needs. It is a deprivation of essential assets and opportunities to which every human being is entitled. Thus, clearly, one can think of poverty from a non-monetary perspective. Although widely used, monetary poverty is not the exclusive paradigm for poverty measurement and non-monetary dimensions of poverty are useful in assessing poverty components. It deserves mention that Poverty is also associated with insufficient outcomes with respect to health, nutrition and literacy, to deficient social relations, to insecurity, and to low self-confidence and powerlessness (World Bank,2000: 2-7).

2.5.5. Unemployment

According to the Resolution concerning statistics of work, employment and labor underutilization adopted in 2013 by the 19th International Conference of Labor Statisticians (ICLS), the standard definition of unemployment refers to all those persons of working age that is 16-64 years, who are without work, seeking work (carried out activities to seek employment during a recent past period), and currently available for work (International Labor Organization ,2013: 7-9).

Unemployment rate is the percentage of people in the labor force that are unemployed. It is the number of people unemployed divided by the population of the labor force multiplied by hundred (100). Labor force is the sum of employed and unemployed people.

Conceptual Framework



Source: Constructed by the Author 2023.

2.6. Empirical relationship between population growth and human development

Rehman Ahmed and Khan, (2022: 2-7) conducted a study to examine the relationships among poverty, food security, rapid population growth, and human development in Pakistan over 1990-2018 to achieve the targets of Sustainable Development Goals (SDGs) 1: No poverty and 2: Zero Hunger.

The study applies time series based econometric approaches, which has the ability to incorporate regime shifts in the estimation process. This study adds in the plethora of knowledge about the phenomena of the study in the context of Pakistan in the following ways: (1) it is a maiden attempt that analyzes the data of food insecurity and poverty to see the impact on human development of Pakistan; (2) it further analyzes the role of rapid population growth on human development in Pakistan; and (3) further utilizes the updated panel econometric approaches like Autoregressive distributive Lag (ADRL) and its methodological underpinnings, which can undertake the regime shifts in the data and, therefore, giving unbiased and efficient conclusions about the nexus among poverty, food insecurity, rapid population and human development. Finally, this study attempts to give informed policy guidelines to policymakers in achieving the targets of SDGs in Pakistan (Rehman, Ahmed and Khan, 2022: 20-23).

the results obtained from autoregressive distributed lags (ARDL) stated that food security and income growth simultaneously increase human development in Pakistan. In contrast, the role of rapid population growth is negatively affecting human development in the country.

Additionally, population growth and poverty are interlinked in terms of low per capita income. The case of Pakistan also presents the same relationship in terms of rapid population growth, lower per capita income, poverty and lower levels of human development. A rise in income is positively associated with human development; it indicates that a one per cent rise in income implies a 0.3499% increase in the country's human development. In comparison, population growth tends to decrease the human development in the country by 0.1823% by keeping other covariates of the model constant. The empirical results obtained from the study have identified that food security in the country tends to raise the human development in Pakistan. Similarly, the role of income is also positive. With rising income, people get better off, which improves their living standards, investment in education, and health, thus resulting in the country's human development (Rehman, Ahmed and Khan, 2022: 17-27).

2.7. Empirical relationship between population growth and inequality.

Studies conducted by the Ethiopian Public Health Training Institute, (2010: 2-10) on rapid population growth and immediate consequences within particular countries, suggest that population growth above 2% a year inhibits efforts to raise income in poor countries with high birth rates and young age structure sub-Saharan Africa. In countries that are already poor, then, rapid population growth only makes matters worse leading to economic insecurity. Economic insecurity, in turn, encourages people to have large families. Poverty and lack of economic opportunities increase incentives to exploit marginal resources, such as overgrazed land, over harvested forests, and thereby further environmental degradation. Further shows that Rapid population growth although not a direct cause, appears to exacerbate all these trends and makes solutions harder to implement.

2.8. Empirical relationship between population growth and poverty

Kiribige, (1997: 2-10) also highlights that one of the most popular explanations for the many problems that face Africa is population growth. Africa's population has doubled since 1960. Africa has the highest fertility rate in the world and the rate of population growth is higher than in any other region. At the same time, Africa faces a social and economic situation that is viewed by many as alarming. Among the problems that devastate Africa is that of persistent poor health. Africa has lower life expectancy, higher mortality rates and is affected by more disease and illness conditions than any other region.

Focusing on sub-Saharan Africa, He examines the relationship between population growth, poverty and poor health. While most analyses have focused on population growth as an original cause of poverty and underdevelopment, He argues that while both population growth and poor health play a significant role in exacerbating the problem of poverty, they are themselves primary consequences of poverty rather than its cause (Kiribige, 1997: 1-10).

2.9. Empirical relationship between population growth and unemployment

Ikechukwu, (2018: 1-9) conducted a study that examines the relationship between population growth and unemployment in Nigeria from 1981 to 2016. The essence of the study is to empirically investigate the relationship that lies between population growth and unemployment in Nigeria. Multiple regression model was employed in the analysis.

The empirical findings indicate that population growth and unemployment have a long run relationship and that population growth has a positive significant effect on unemployment in Nigeria (Ikechukwu, 2018).

THEORETICAL FRAMEWORK

Malthusian Theory of Population

The Malthusian theory is a theory of population growth that was proposed by Thomas Robert Malthus in his 1798 book, *An Essay on the Principle of Population*. This book has been widely viewed as having a very significant impact on biological and social sciences by recognizing the basic bio-physical, demographic, economic and social principles that can likely lead to population growth or population decline and the impact of either situation (Malthus, 1798: 1-8).

Malthus argued that population growth has an ever-present propensity to eventually outstrip the available resources, means of subsistence that places the happiness and morals of the mass society under persistent threat leading to famine, disease, and social unrest.

Malthus further believed that, population growth was exponential that is geometrical, while food production was arithmetically linear.

Simply put, the overwhelming increase of population was offset by the diminishing return of fixed factor of production which is land, food on the other hand will only increase in an arithmetic progression. This later developed in the hands of Malthus and others into a generalization known later as the law of diminishing returns speaking to an increase in labor applied to the cultivation of a land causes in general a less proportionate increase in the amount of produce because the land is a constant entity - this law, held to be peculiar to agriculture and the mining of raw materials, that was to dominate English political economy for over half a century and can be said to be true even in the African context (Malthus, 1798:1-10).

This meant that the rate of population growth would eventually exceed the rate of food production, leading to a population that was larger than the available food supply. Furthermore, gains in living standards would be but temporal. Then, also giving rise to a collapse of population to subsistence levels.

Demographic Transition Theory

Demographic Transition Theory: This theory suggests that population growth and economic development are interrelated. According to this theory, as countries develop economically, they go through a series of demographic changes, moving from high birth and death rates to low birth and death rates. This transition is associated with changes in social and economic structures, including increased access to education, healthcare, and family planning. The theory links population growth or decline to the prevailing economic, political and social factors of a particular society (Caldwell, 2006: 10-20).

This theory refers to the historical shift from high birth rates and high infant death rates in societies with minimal technology, education (especially of women) and economic development, to low birth rates and low death rates in societies with advanced technology, education and economic development, as well as the stages between the shift (Mahmud, 2020: 9-15).

A generalized explanation of the evolving trend of mortality, fertility and growth rates as societies shift from one demographic regime to another is the demographic transition theory. The theory is based on an analysis and interpretation of demographic history by the American demographer Warren Thompson (1887–1973) of demographic history developed in 1929. By 2009, the presence of a negative association between fertility and economic growth had become one of social science's most generally recognized findings. Must be noted that, the demographic Transition theory is explained in four (4) stages (Angeles, 2010: 10-20).

3. METHODOLOGY

This research employed an explanatory mixed or hybrid method research design which involves both quantitative and qualitative data (primary and secondary) sets on population and human development. Consequently, utilizing a vast pool of information sources that will depict the status quo (Giri, 2021: 26-28).

This type of approach is beneficial in that, the combination of both qualitative and quantitative data provides a detailed and contextualized understanding of the research thus allowing for a more comprehensive and deeper analysis that is balanced. It further also offers sufficient depth and breadth that comes with an integration of methodological flexibility and logical ground of analysis of multiple data sources. (Giri, 2021: 26-28).

For the collection of primary qualitative data using structured interviews, purposive and convenient sampling was employed as a type of non-probability sampling in which the researcher selected key respondents from government ministries and private companies in Zambia because they possess characteristics that are needed for the sample. The units are selected on purpose and relies on the researcher's judgement as the identification helps the researcher to obtain information from the best suited individuals, communities or organizations. The researcher also relied on snowballing technique to get key informants (Fleetwood, 2020: 2-5).

The researcher further employed content analysis to analyze the interviews from key informants. Content is the message, while the analysis is the meaning derived from the message. Content analysis is a systematic approach that is used to recognize patterns in various recorded communication. It should be noted that, content analysis assisted the researcher in finding similar themes of study throughout the literature review thus building data sets for further analysis and introduction into the study (Bhatia, 2018: 2-5).

For secondary data, quantitative secondary data is in this case numerical data already collected through primary methods and is readily available for the researcher. The data used for this study was obtained from the indices such as: World Development indicators, the Zambia Statistical Agency, International Labor Organization, United Nations Agencies, Standardized World Income Inequality Database and the World Bank. An analysis was made to establish causality and the extent of the relationship of the relation of the phenomena. These indices provide statistics on annual population, human development, poverty, inequality and unemployment and will be examined from the year 1992-2022, this time series enabled the researcher to examine and analyze a particular pattern that exists in relation to the variables used in this research.

Using the granger causality as the estimation technique specifically utilized the Vector Autoregressive (VAR) model and correlation tests, the results show that that population growth causes human development and poverty meaning that as population is increasing both human development and poverty are increasing.

Using Stata 17, which provides a comprehensive set of models and techniques for analyzing time series data. Vector Autoregressive (VAR) was specifically employed to analyze the interdependencies amongst the multiple variables used in this study. Equally, identifying the linear relationship between that exist between the variables. VAR was utilized to also test the hypotheses of the study.

Furthermore, the Vector Autoregressive model is a statistical model used to analyze the relationship between multiple time series variables. It is an extension of the univariate autoregressive model (AR), where each variable in the system is regressed on its own lagged values as well as the lagged values of the other variables in the system. The general formula for VAR model of order p , denoted as VAR(p) is written as:

$$Y_t = c + A_1 * Y_{t-1} + A_2 * Y_{t-2} + \dots + A_p * Y_{t-p} + e_t$$

Where:

Y_t is a k -dimensional vector of endogenous variables at time t .
 c is a constant term (intercept).

A_i (for $i = 1$ to p) are the coefficient matrices of lagged values.
 Y_{t-i} represents the values of the endogenous variables at time $t-i$.

e_t is the error term or residual vector at time t .

Correlation test was further employed which quantifies the extent to which two quantitative variables are associated. For example, when high values of X and are associated with high values Y , it implies that there is a positive correlation between the two. On the other hand, when high values of X are associated with low values of y , it then implies that there exists a negative correlation between the two variables (Mooi, 2014:194-210).

whereas:

Formula

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

r = correlation coefficient

x_i = values of the x-variable in a sample

\bar{x} = mean of the values of the x-variable

y_i = values of the y-variable in a sample

\bar{y} = mean of the values of the y-variable

4. RESULTS

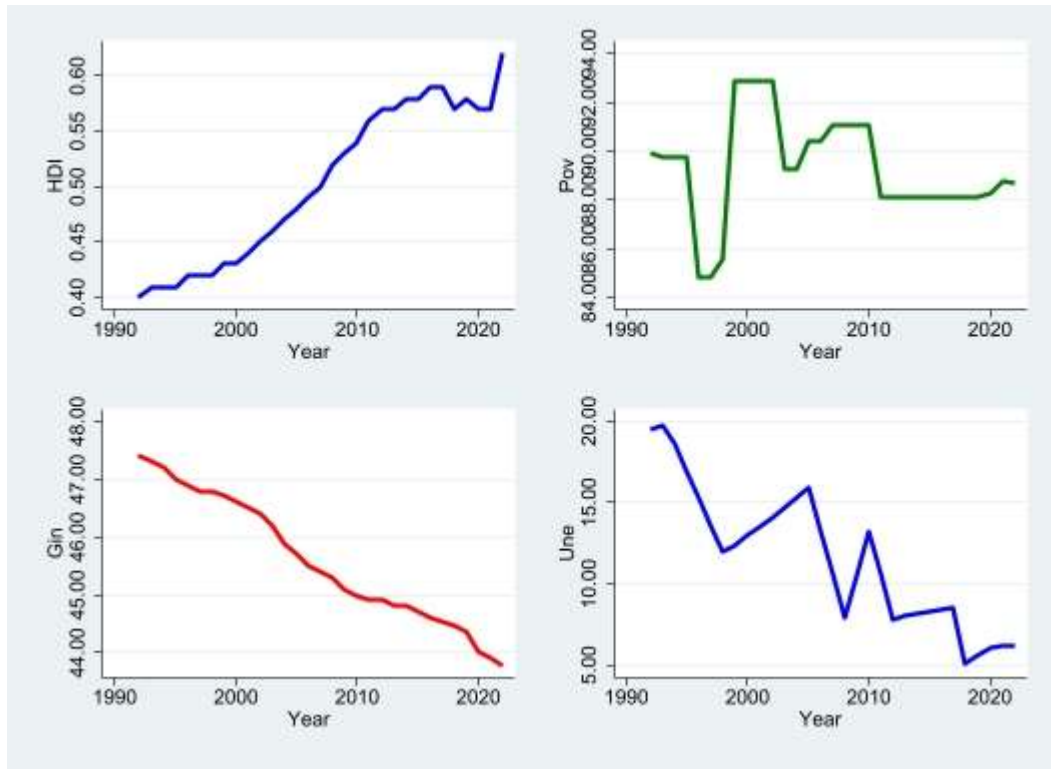
Trend Analysis

4.1. Human Development Indicators

The overall aim of the study was to investigate whether population growth causes human development. Human development was proxied on poverty at \$5.5/day, income inequality measured by the Gini index and unemployment. Figure 4 indicates the trends for these variables including the human development index. From 1992 to 2022 human development has increased at a rate of 55% on average from 0.40 to 0.62 in those years. Human development fluctuated between 0.40 and 0.43 between 1992 and 2000 before steadily increasing at an increasing rate until 2017, thereafter, declined and oscillated before peaking up in 2022 to the highest value of 0.62. Regarding human development performance, Zambia has moved from a low to the medium rank over 31 years. Poverty is another important indicator for human development. When the number of people living below a certain poverty threshold decrease, the better are the living conditions of the same people. Consequently, the better the performance in human development. In the study, poverty was measured at \$5.5/day. The percentage of Zambians living below \$5.5/day has fluctuated between 84% and 92.9% between 1992 and 2022. The lowest values of poverty were recorded in 1996 and 1997 at 84.8% and the highest value recorded between 2000 and 2002 at 92.9%.

Concerning inequality and unemployment, there is consistent decline in both indicators for the study period. However, inequality has consistently declined over the period studied at a rate of 7.6%. On the contrary, despite declining over the period, unemployment continuously oscillated downwards. Overall, as can be seen from figure 1 only poverty has remained upwards and worrying for Zambia while inequality and unemployment have shown significant reduction. Therefore, improved performance in human development can be attributed to greater improvement in inequality and unemployment reduction over the years. The 2007-2009 global financial crisis deemed to have no effect on human development for Zambia while the Covid 19 pandemic led to the decline in human development in 2020. In addition, the pandemic also led to an upward shift in unemployment in 2020 and 2021. This is attributed to job losses and employment freeze evoked by companies during the pandemic. In addition, border closures and restricted movement destabilized Zambia's economy thereby affecting many businesses.

Figure 1.1. Human development indicators trends



Source: Constructed by the author using data from World Development Indicators and SWIID.

4.2. DISCUSSION

This section speaks to the quantitative trends observed in results and later the responses from the key informants.

4.2.1. Investigating whether population growth causes income inequality in Zambia.

This study’s first objective was to investigate whether population growth causes income inequality in Zambia using data from 1992 to 2022. Income inequality was measured by the Gini coefficient whose data was obtained from Standardized World Income Inequality Database (SWIID). The time series Granger causality test was run to determine if population growth causes human development. Under the null hypothesis of population growth does not Granger cause income inequality, the study findings cannot reject this hypothesis given the associated p-value of 0.543 as indicated in table 5. Therefore, Zambia’s population growth between 1992 and 2022 has not caused any imbalances in income among the population. This suggests that other factors are important in causing income inequality in Zambia other than population growth. Taking into account other indicators, the study findings show that trade, inflation and gross domestic product growth do not cause income inequality in Zambia as indicated by the p-values of 0.408, 0.831 and 0.749 respectively. Further, the hypothesis that all of these variables do not cause income inequality is accepted (fail to reject) as shown by the p-value of 0.861.

Table 1. Granger causality Wald test for population growth and income inequality.

Equation	Excluded	Chi2	Df	Prob > Chi2
Gini	Population growth	0.36952	1	0.543
Gini	Trade	0.68598	1	0.408
Gini	Inflation	0.04566	1	0.831
Gini	GDP growth	0.10276	1	0.749
Gini	All	1.304	4	0.861

Source: Constructed by author using data from World Development Indicators and SWIID.

4.2.2. To examine whether population growth causes poverty in Zambia.

The study's findings on whether population growth causes poverty in Zambia are indicated in table 2 Poverty in this study was captured as the percentage of people living on less than \$5.5/day. As indicated in the table, population growth was found to significantly cause poverty in Zambia at all levels of significance given the associated p-value of 0.000. Therefore, in this case we reject the null hypothesis that population growth does not cause poverty in Zambia. Similarly, trade, inflation and gross domestic product growth were found to cause poverty in Zambia between 1992 and 2022 at all levels of significance. As such, the associated null hypotheses that trade, inflation and gross domestic product growth do not cause poverty are rejected at all levels of significance. Moreover, when all variables are taken into account, the study findings show that they all significantly cause poverty in Zambia.

Table 2. Granger causality Wald test for population growth and poverty.

Equation	Excluded	Chi2	Df	Prob > Chi2
Poverty	Population growth	19.867	1	0.000
Poverty	Trade	18.252	1	0.000
Poverty	Inflation	50.827	1	0.000
Poverty	GDP growth	19.662	1	0.000
Poverty	All	106.82	4	0.000

Source: Author using data from World Development Indicators and SWIID.

4.2.3. Objective Three: To investigate whether population growth causes unemployment in Zambia.

Table 3 provides the results for the causes of unemployment in Zambia when run using Granger Causality test. Population growth, trade, inflation and gross domestic product were included in the analysis. The study findings point that population growth does not cause unemployment in Zambia provided the insignificance of the results leading to the acceptance of the null hypothesis that population growth does not cause unemployment at the 5% level significance. This result is confirmed by the p-value of 0.055. In the same way, trade, inflation and gross domestic product growth did not cause unemployment in Zambia between 1992 and 2022. When all variables were analysed to determine whether they have combined cause on unemployment, the study findings indicate that they did not cause unemployment in Zambia.

Table 3 Granger causality Wald test for population growth and unemployment in Zambia

Equation	Excluded	Chi2	Df	Prob > Chi2
Unemployment	Population growth	3.6986	1	0.055
Unemployment	Trade	2.0932	1	0.148
Unemployment	Inflation	0.04015	1	0.841
Unemployment	GDP growth	0.98315	1	0.321
Unemployment	All	9.0692	4	0.059

Source: Author using data from World Development Indicators and SWIID.

4.2.4. Population growth and human development

The study findings in table 5 are for whether population growth causes the overall measure of human development as captured by the human development index. As shown in the table, population growth causes human development given the p-value of 0.000. As a result, we reject the null hypothesis that population growth does not cause human development in Zambia. On the contrary, trade, inflation and gross domestic product growth was found not to cause human development in Zambia for the period studied. However, the combination of population growth, trade, inflation, and gross domestic product significantly cause human development in Zambia as given by the p-value of 0.000.

Table 5. Granger causality Wald test for population growth and human development in Zambia

Equation	Excluded	Chi2	Df	Prob > Chi2
Human development index	Population growth	24.039	1	0.000
Human development index	Trade	2.3392	1	0.126
Human development index	Inflation	2.0749	1	0.150
Human development index	GDP growth	0.37253	1	0.542
Human development index	All	60.956	4	0.000

Source: Author using data from World Development Indicators and SWIID.

4.3. Presentation and Analysis of Interviews

This section delves into the presentation and analysis of the key informants’ responses from the interviews conducted by the researcher. The interview data was presented.

Table 6. Key respondents Information.

INSTITUTIONS	GENDER	PSEUDONYM	NUMBER OF INTERVIEWS
Central Statistics Office	Male	Respondent A	1
GreenCo Energy Limited	Male	Respondent B	1
Ministry of Agriculture	Male	Respondent C	1
Ministry of Education	Male	Respondent D	1
Ministry of Health	Female	Respondent E	1
Ministry of Local Government and Rural Development	Female	Respondent F	1
Ministry of Youth, Sports and Arts	Female	Respondent G	1
Mulungushi University	Male	Respondent H	1
Socialist Party Zambia	Female	Respondent I	1
The University of Zambia	Male	Respondent J	1
TOTAL			10

Source: Constructed by the Researcher.

4.3.2. Does population growth cause human development in Zambia?

The first objective investigated whether population growth causes human development in Zambia from 1992-2022. Based on the quantitative results obtained in that specified threshold, human development has increased at a rate of 55% on average from 0.40 to 0.62 in those years. Human development fluctuated between 0.40 and 0.43 between 1992 and 2000 before steadily increasing at an increasing rate until 2017, thereafter, declined and oscillated before peaking up in 2022 to the highest value of 0.62. Regarding human development performance, Zambia has moved from a low to the medium rank over 31 years.

It deserves mention that, the relationship between human development index and population growth is positive and significant with a correlation ratio of 0.588.

Qualitatively, thirty percent (30%) of the informants strongly stated that population growth causes human development in Zambia in that, there is so little a country can do without population growth, for a country to achieve development, population growth must be factored in. It is particularly very important to factor in the fact that activities that require human capital in its multi-dimensional sense is what has shifted Zambia from its low-income status to middle income status.

Population growth in Zambia has created demand for different commodities and has in the recent past created room for innovation because people are now looking at various ways of meeting the growing demands and needs of the people.

What people get to do at micro level is translated into what will obtain at national level. Unless there is a serious crisis then, the story becomes different. It is evident from the country's GDP over the past 31 years that with the increase in population comes the increase in GDP unless in peculiar years that it did not translate into growth in GDP. The same applies to Human Development over the years, with the increase in population, human development increases in that human capital is utilized that translates into development and also the government deliberately enact policies that favour the growth of people. This has been evident in the introduction of free education from primary level to secondary level, construction of public infrastructure to sustain the growing population like roads, health care posts, the increase in community funding like the Community Development Fund (CDF) and Farmers Input Support Program (FISP) among others.

On the other hand, fifty percent (50%) of the respondents explicitly stated that population growth does not cause human development in Zambia. Stating that in most cases our system does not favour the growth of individuals that translates in human development, it must be noted that, in most cases our population growth has not translated into meaningful development in the individual lives of the people in the country.

Respondent F stated that, globally, increase in population causes human development. However, this is highly contextual and is dependent of the environment that these dynamics are operating. For example, China leveraged on its population growth to ignite development in that with its technological advancement and highly innovative minds that have been cultivated through research and an educational system that favours growth of its people. The system highly favours and empowers thinkers to an extent that innovation is highly welcomed and funded.

This is as opposed to the Zambian system that is highly backward, does not favour innovation in that for example, the Zambian education curriculum is a copy and paste of that of the British system that inherently was not meant for the development and growth of the British colonies.

Additionally, the aspect of agriculture, a critical segment that literally more than half if the population depends on has proved to be very subsistence, citizenry hardly produce on a commercial scale. This can be attributed to lack of machinery and the hefty amounts needed to acquire farming inputs that the ordinary citizen cannot afford.

It further deserves mention that, according to respondent G, Zambia's infrastructure is generally not fully invested in. The number of unplanned settlements that have led to the emergency of slums and shanty compounds in the urban areas, is equally alarming. It is evident in the educational structures and health centres that in most cases are in dire need of rehabilitation. The teacher Pupil ration in these schools is far from sufficient and with the introduction of free education in Zambia, the discrepancy is highly alarming. The lack of medicines in hospitals is another alarming situation that does not speak to population translating to human development, it instead speaks to how population growth has stressed these facilities to an extent that the doctor patient- ratio does not match, drugs are hardly accessible in health facilities especially in the rural areas.

Respondent E stated lamentably stated that whilst prices of goods and services are increasing on a daily basis sparked by different factors among them the fluctuation of the exchange rate between Kwacha and the dollar some individuals are more affected because they are unemployed and the cost of running a business is high yet they still have to purchase goods and services at the same price with the elite who do not feel an inch of the biting economy. This inherently causes inequality, poverty, crime amongst other ills that are against the general welfare of the citizenry.

Further, twenty percent (20%) of the respondents stated that, it really is a two sided coin question that looks into the intricacies of the Zambian environment in that in some cases population growth has prompted growth in certain areas especially urban areas and has led to the rise of innovation and government deliberate policy whilst on the other hand, population growth has stressed public facilities to an extent that what remains are just dilapidated structures without their initial use and this is at the expense of the citizenry. Without a proper plan of how to contain population growth in Zambia, it is almost inevitable to see it being translated into meaningful human development.

4.3.3. Does population growth cause income inequality in Zambia?

Quantitatively, income inequality was measured by the Gini coefficient whose data was obtained from Standardized World Income Inequality Database (SWIID). The time series Granger causality test was run to determine if population growth causes human development. Under the null hypothesis of population growth does not Granger cause income inequality, the study findings cannot reject this hypothesis given the associated p-value of 0.543.

Interestingly, the fifty percent of the respondents ascertained that Population growth does not cause inequality and the other half explicitly stated that population growth causes income inequality.

The former speaks to the fact that population growth will not cause a discrepancy in citizens' income but lack of proper and intentional policies and the lack of enforcement of those policies will. This is because under normal circumstances Zambia's population is sustainable and the citizenry must have a fair distribution of resources and income to sustain themselves.

Respondent H states that as population is increasing, income inequality will be reducing as they will be a redistribution of resources through taxes in various forms which then, the resources collected are injected into the economy to cater for the needs of the citizenry.

Further, because of increase in population people have highly become highly innovative and entrepreneurial to an extent that they are able to source for income from various avenues. Additionally, the government instituted minimum wage for every informal worker but the enforcement of this policy has been poorly carried out, this then will result to income inequality as the manual workers and the informal workers (domestic workers) will be rewarded as deemed fit by the employer. This is especially true with the house keepers.

The latter speaks to how opportunities in Zambia are unevenly distributed, Zambia is ranked the fifth (5th) most unequal country in the world. It is evident in the recruitment of public servants and the awarding of contracts to elites. This further implies that certain tasks will only be performed by elites at the expense of other people. The richer will continue getting richer whilst the poor will continue to wallow in their poverty.

It further deserves mention that the select few tend to have access to certain resources in the country, this could largely be attributed to the fact that, normally certain tasks need specialized personnel, a multi-million-dollar bank account or perhaps for one to get employed they need to at least know someone at the very top of the hierarchy. This creates a chain of nepotism and tribalism, owing to the fact that, unless one knows someone, they are likely not to get employed. This, of course is not a universal situation as some institutions do employ on merit.

This situation creates a discrepancy in the income that the general citizenry gets to obtain at the end of their work as some highly qualified individuals end up almost doing nothing or settling for the barest minimum that can at least put food on their tables. This can be attributed to weak institutions that are driven by politicians, who inherently do not support people getting rich based on what they put in. Politicians tend to be bigger and more powerful than institutions. This gets to affect the overall welfare of people. This explains the reason many African countries have many corruption scandals that have gone unchecked, unaccounted for or even unpunished.

Additionally, globally countries that have reduced inequality have intentional policy direction that reduces the aforementioned and in most cases are highly productive countries meaning they have the capacity to turn raw materials into finished goods that in the long run enables the citizenry to have some form of work at every point, unfortunately that is not the case with Zambia which is a highly consuming nation.

This further means that, a highly consuming country will solely depend on imports and the few manufacturing companies that produce commodities within its boundaries are Multi-National Cooperation's that literally take all profits and to their country of origin (Capital flight), it must be noted that most times, these companies come into the country with their expertise and only outsource manual labour from the locals. This also contributes to income inequality. This is normally the case in the mining sector on the Copper belt province.

4.3.4. Does population growth cause poverty in Zambia?

Poverty in this study was captured as the percentage of people living on less than \$5.5/day. Population growth was found to significantly cause poverty in Zambia at all levels of significance given the associated p-value of 0.000.

Qualitatively, eighty percent (80%) of the respondents out rightly stated that population growth causes poverty in Zambia and the remaining twenty percent (20%) strongly believe population growth does not cause poverty in Zambia.

The latter speaks to the fact that Zambia is not a manufacturing economy, it is highly dependent on agriculture which is subsistent in nature. Respondent I categorically stated that these aspects of human development are highly intertwined, in most cases, when a country has insufficient industries, it trickles down to affect aspects of infrastructure, poverty, unemployment. It then creates a system in which a larger population chasing limited opportunities and, in most cases, this creates poverty because then people are unable to fend for themselves and meet their daily needs.

Additionally, commodities expensive because of the taxes that are slapped on traders when importing, consequently, in order to make ends meet, commodities are highly priced to an extent that the ordinary citizen cannot afford them. This typically causes a vicious cycle of poverty.

In many provinces like Luapula, malnutrition and child stunting are very alarming. Owing to the fact that there is insufficient food and, in most cases, children hardly know what a balanced diet should look like. In a country endowed with good weather pattern favour for farming, although climate change has affected the cumulative rainfall that the country is receiving. It should still be able to produce enough to feed the entire population, unfortunately this is not the case as experienced in the mealie meal shortage that the country is experiencing. This could be attributed to either a bad harvest, or citizens finding a more lucrative market outside the boundary of the country or perhaps poor management on the part of government considering that they equally on an annual basis purchase and store maize.

A country's staple food cannot under normal circumstances become a rare commodity unless there is a serious problem with management. An ordinary Zambia cannot afford buying a twenty-five-kilogram (25KG) bag of mealie meal owing to its ridiculously expensive price.

Respondent B additionally stated that when you analyse the poverty rate in all nine (9) provinces of Zambia, the alarming poverty rate goes as high as 92.1% this is as population growth is increasing. This is attributed to the fact that the same health, education and other public facilities that were meant for a specific number of people are still the ones that are being utilized even when the population is clearly increasing. This stresses these facilities and causes serious inadequacy that then translates into all forms of poverty.

Respondent A further stated that countries like China leveraged on their population translating it into meaningful development because they are highly productive countries and control the means of production as opposed to the case of Zambia in which the means of production is to a larger extent not owned by the state. Without key manufacturing industries in the country, poverty, unemployment and inequality is inevitable. This can actually be expressed even in the levels of crime in the capital city. People are both hungry and hunger, consequently are forced to indulge in vices like theft, commercial sex working, early marriages and witchcraft funny enough.

On the other hand, respondents' F and H explicitly attributed poverty not as an outcome of population growth, because population growth in Zambia is sustainable and has apparently been utilized to grow the economy. What has been done with the population growth in some cases is what has led to poverty.

Because as population increases, there creates an avenue for mass production for example in the agriculture sector, the government has been distributing Farming inputs through the Farmers Input Support Program (FISP) in order to make available the inputs for the aged and the people that cannot afford to buy them at the initial price. This cater for the population although it has been highly politicised, many people have testified to how FISP has helped them fend for their families and out of the sales from the extra produce they have educated their families.

The lack of prudent distribution of resources on the government side could also be attributed to causing poverty and equally, how well are the distributed resources utilized on the recipients' end matters much.

4.3.5. Does population growth cause unemployment in Zambia?

The quantitative findings point that population growth does not cause unemployment in Zambia provided the insignificance of the results at the 5% level significance. This result is confirmed by the p-value of 0.055. In the same way, trade, inflation and gross domestic product growth did not cause unemployment in Zambia between 1992 and 2022.

Qualitatively, fifty percent (50%) of the respondents beyond reasonable doubt stated that population growth does not cause unemployment if, anything it causes employment while the remaining fifty percent (50%) of the respondents categorically stated that an increase in population most likely causes unemployment in Zambia.

The former stated that when population is increasing in Zambia, it is recorded that people have highly become innovative and literally tend to think outside their normal comfort zone, this creates entrepreneurial ideas that result into tangible and lucrative businesses that in turn tend to employ people even outside the civil service space.

Respondent D mentioned that, unemployment refers to people who are actively seeking jobs but are unable to find, the key term is actively, if someone has not applied for a job in more than a month then they are not actively seeking employment. So, coining this term and relating it to population growth in the country should be done with utmost clarity. Because statistics will only capture those individuals that are actively seeking work.

Additionally, respondent H stated that, population growth creates a certain demand for different commodities, goods and services that are specific to needs of the people in that locality. Therefore, In Zambia, we have experienced a situation in which people in a certain area decided to meet the needs of the locals and have since employed a good number of people in that regard. The demand

that is created by a growing population has given rise to an expansion in consumption, this implies that on a local scale people will be in a bid to meet the consumers' needs and consequently create work for themselves and the people around.

Further, it deserves mention that, when a population is growing, the citizenry tends to also want to be better empowered through education and skill and when this is actualized in their various capacities, it then becomes easy for people to be assimilated in the field of specialty as the need for experts becomes almost inevitable. This has been seen in fraternities like that of security, climate change, gender, sports, medicine amongst others. because the government is constantly seeing the need to cater for the growing population, human resource from the citizenry is needed for example the recruitment of teachers, agriculturists and doctors in the recent two years is an expression of governments commitment to ensure that the population is well catered for.

On the other hand, respondent A, B and J dramatically stated that an increase in Zambia's population can be said to be saturating the job market, how many graduates on an annual basis are offloaded in this space and yet have not found anything tangible to do? It is not even a matter of statics because when one steps out to get groceries, one is likely to meet on average three (3) graduates with bachelors' degree in a mobile money booth or perhaps languishing in the streets actively looking for employment.

Of course, other factors could be causes unemployment but it is to a greater extent that population growth in Zambia is also stressing the job market as they are now too many people seeking or chasing very few opportunities available. In the times of Zambia's first president Dr. Kenneth Kaunda (MHSCRIP) when Zambia's population was around three million, almost everyone had something to do. A term coined Zambianisation was instituted by the president to have Zambians running institutions and also in top leadership positions. Before one could even graduate, they would have already been offered a decent job.

Others could argue using the theory of dynamic inconsistencies considering that the times have changed and each era and regime is accompanied by intricate situations that are peculiar. Whatever the case is, it is the sole responsibility of the government to ensure that the interest and welfare of the people is prioritized and that the people are able to meet their basic needs no matter the situations.

It further deserves mention that, according to respondent F, Zambia is the eighth (8th) world's largest exporter of copper, it is highly endowed with this mineral such that it contributes largely to the economy of the country. However, the mines from which the mineral is mined are not owned by government this means that, the multi-national companies that run these mines tend to come with their own expertise and normally what is left for the locals is basically typical digging and clerking. This does not promote the employment of the locals.

Additionally, our copper is not turned into finished products within the country. It is exported in its raw form at a way cheaper price compared to the various finished products that it produces. It is lamentable that the lack of production/manufacturing industries has led to unemployment as may people could benefit from the various stages that our copper goes through to get to the various finished goods.

5. CONCLUSION

From the evidence of the study, population growth being highly contentious with regards its effect on the general population. It is revealed that in the case of Zambia, population growth causes human development and poverty. These two variables have a positive relation in that as population is increasing human development is increasing. And unfortunately, as population is increasing, poverty levels are also increasing.

On the other hand, the study has shown that there is a negative relationship between population growth and income equality as well as unemployment. This means that as population is increasing, income inequality is reducing and unemployment reduces as well

5.1. Recommendations

Fifty-nine (59) years since Zambia attained her independence in 1964, there are certain challenges that the country should not be faced with especially in the twenty-first century. From the study, it is evident that poverty has remained a serious challenge and when delved into individual provincial poverty rates, they are as high as ninety-one percent (91%). The malnutrition and child stunting rates are equally so high, the cost of living is high to an extent that the citizens can hardly afford the National staple food not to even talk of a balanced meal. There is truly so much the government needs to do to change the status quo in order to improve the livelihood of the Zambian people.

The study therefore recommends that:

The Government of the Republic of Zambia needs to deliberately and adequately fund research and developmental projects. A well-researched country is better placed at making better policies and laws that are country specific and cater for the needs of its population. Research and development projects will give the state a snapshot of what truly is obtaining on the ground and consequently seek better alternatives of changing the status quo. It is also paramount that research, technology and development projects/organizations be independent from politics or the government so as to curb them from being puppets of the government.

The government should create a minimum social policy protection for all citizens that will foster communal development. The standard of living in Zambia is tiered in two extremes. The haves and the have nots clusters have created a society that is individualist.

There is need to cultivate an education system that fosters innovation, creativity and material development. This can be done by revising the curriculum to suit the Zambian environment, one that is actively responsive to the peculiar needs of the Zambian people, one that promotes innovation from primary school. Not a copy and paste of what the colonial masters had handed over to the people.

There is immense need to invest in advanced health and nutrition, it cannot be overemphasized that a healthy nation is a wealthy nation. This is because, when citizens are healthy, they contribute greatly to the general output and actualization of institutional goals. Investment in nutrition is as vital as building quality, well equip health centres in all the ten provinces of Zambia.

setup industries that will boost employment levels and make affordable the prices of various commodities. Equally, revamping already existing textiles and factories that were once operational would be a step in the right direction as this will boost the country's GDP and generally the livelihood of the people. This will also promote people buying locally produced goods that are environmentally friendly. It also becomes an opportunity to export finished products and by-products of our mineral endowments across Africa and beyond, consequently strengthening the country's currency on the global front. At all these processing stages, the need for human resource will be inevitable, this then translates into employment opportunities for the citizenry.

Empowering women, youths and the marginalized in the societies will lead to massive productive in that fifty plus one percent (50+1%) of Zambia's population is female and majority of them are youths. This implies that investing in them will produce better output. The fact that women are multipliers and better stewards of finances, it is important to also give them responsibilities even at national level. Keep women and the youth informed and empowered by having deliberate programmes that constantly engage them.

Lastly, the need for political will to firstly acknowledge the challenges and avoid politicking around issues that affect the welfare of the people is the first step in the right direction to addressing and offering solutions to the challenges. This is not a solo performance that the government can undertake without the input of the people. It is for this reason that, involving the people will help find collective and realistic solutions

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Quantitative data for all variables of the study, 1992-2022

Year	HDI	Gin	Pov.	Une.	Pop.	Trade	Inflation	GDP
1992	0.4	47.40692	89.917	19.46	2.430372	66.65059	165.7065	-1.73092
1993	0.41	47.28626	89.878	19.7	2.405463	69.22677	183.312	6.797274
1994	0.41	47.1656	89.839	18.679	2.428276	63.82148	54.60132	-8.62544
1995	0.41	47.04495	89.8	16.858	2.446966	58.27286	34.92959	2.897669
1996	0.42	46.9	84.8	15.3	2.478031	56.25031	43.0731	6.218546
1997	0.42	46.8	84.8	13.638	2.56332	59.76753	24.41872	3.814007
1998	0.42	46.8	85.6	12	2.586109	60.38747	24.45846	-0.38575
1999	0.43	46.7	92.9	12.411	2.620055	64.66828	26.7877	4.65019
2000	0.43	46.6	92.9	12.93	2.766606	64.9165	26.03041	3.897323
2001	0.44	46.5	92.9	13.503	2.996056	62.31284	21.39378	5.316868
2002	0.45	46.4	92.9	14.131	3.056528	70.81307	22.23334	4.506014
2003	0.46	46.2	89.3	14.686	3.089114	62.20028	21.40158	6.944974
2004	0.47	45.9	89.3	15.294	3.178936	57.85682	17.96779	7.032395
2005	0.48	45.7	90.4	15.9	3.31267	65.77146	18.32444	7.235599
2006	0.49	45.5	90.4	13.235	3.456237	59.45489	9.019572	7.903694
2007	0.5	45.4	91.1	10.576	3.532921	56.12138	10.65735	8.352436
2008	0.52	45.3	91.1	7.93	3.571097	67.90092	12.44558	7.773896
2009	0.53	45.1	91.1	10.56	3.554843	76.21473	13.39525	9.220348
2010	0.54	45	91.1	13.19	3.497191	79.1007	8.501761	10.29822
2011	0.56	44.9	88.1	10.585	3.37711	80.45602	6.429397	5.564602
2012	0.57	44.9	88.1	7.85	3.30148	76.19366	6.5759	7.597593
2013	0.57	44.8	88.1	8.005	3.271299	79.86542	6.977676	5.057232
2014	0.58	44.8	88.1	8.133	3.247118	73.95856	7.806876	4.697992
2015	0.58	44.7	88.1	8.28	3.191896	71.58569	10.11059	2.920375
2016	0.59	44.62282	88.1	8.393	3.147407	74.88837	17.86973	3.776679
2017	0.59	44.53794	88.1	8.52	3.113595	68.7912	6.577312	3.504336
2018	0.57	44.45306	88.1	5.03	3.061888	79.32549	7.494572	4.034494
2019	0.58	44.36819	88.1	5.54	3.007618	85.99218	9.150316	1.441306
2020	0.57	44.02855	88.825	6.03	2.933818	65.58888	15.73306	-2.78506
2021	0.57	43.9079	88.786	6.22	2.840806	77.50389	22.02077	4.598734
2022	0.62	43.78724	88.747	6.131	2.758032	78.12288	10.9932	4.744942