

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, in the case of Harare province

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DECLARATION

I, Farai Gaba declare that this thesis entitled

**AN INVESTIGATION OF CIRCUMSTANTIAL AND DURATIONAL URBAN POVERTY
BY DEVELOPING A NEW MULTIDIMENSIONAL MEASURE IN THE CASE OF
HARARE PROVINCE**

is my own work and all material-resources used or mentioned have been properly acknowledged in the references, and that I have not beforehand submitted this thesis for degree purposes at this or any other university.

Farai Gaba

DEDICATION

This thesis is dedicated to my family; my loving wife Mirriam and my children Ethan, Megan and Bernice

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Glory be to God, the Almighty Father for making all things possible; and for taking my academic endeavour this far and for the good health.

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ABSTRACT

This study investigated circumstantial and durational urban poverty by adapting the UNDP MPI and developing a new multidimensional measure in Harare province. The study divided Harare province into 4 locations which are Harare rural, high density, medium density and low-density locations. The data used in this study was collected using a questionnaire employing a stratified simple random sampling across all 46 wards in all locations in Harare in order to investigate circumstantial and durational poverty in Harare. The study strove to objectively adapt the UNDP MPI and then generate a multidimensional poverty measure specifically for Harare province that can determine circumstantial and durational poverty for the city. Such a study has never done for Zimbabwe and Harare in particular and UNDP in general has not included durational aspect in its MPI. This makes the study unique in its contribution to both theory and practice.

The study operationalised two broad objectives: theoretical and empirical objectives. The theoretical objectives were designed to critically review theories of poverty and their applicability in the context of Zimbabwe, to review and critique the existing measures of poverty and their applicability to Zimbabwe, to review theories on trends of poverty and how they contradict each other based on the different measures, to review and critique the existing durational poverty measures and their applicability in Zimbabwe and to review and critique literature on circumstantial poverty. The empirical objectives of the study were crafted to adapt the UNDP MPI and develop a multidimensional measure of circumstantial poverty, to determine the durational urban poverty for Harare province, to compare poverty among the locations in Harare using the developed multi-dimensional measure, to determine the perception of urban poverty in Harare province, to investigate the drivers of circumstantial urban poverty in Harare and ultimately offer recommendations on policies designed to reduce urban poverty in Zimbabwe.

Quantitative research design was used and the data were collected using stratified simple random sampling from household heads or their spouses. To enable robustness of the study, a pilot study was administered at 11.4% of the sample target of 400 households. Open Data Kit (ODK) was used to collect data from the sample to the domain server of the study in real time.

The study used UNDP MPI methodology to develop a new multidimensional poverty measure for Harare province. The multidimensional poverty measure that was developed for Harare uses household as a unit of identification. The study used 7 dimensions and 46 indicators to generate the multidimensional poverty measure for Harare. The dimensions and indicators used in this study were based on United Nations Sustainable Development Goals 2030 and various ongoing

academic discourses on poverty measurement. The dimensions used are education, health, standards of living, economic security, empowerment and participation, environment and public infrastructure and food adaptation. The dimensions and indicators were allocated equal weights on the researcher's strong convictions that all dimensions and indicators are equally important. Alkire and Foster (2011) methodology was used to arrive at the poverty head count and poverty intensity which are the seminal constructs of multidimensional poverty measure

Descriptive statistics and logistic regression were used to ascertain results for the empirical objective of the study. The study first performed multicollinearity test using Variance of Inflation factor (VIF) values. Hosmer and Lemeshow test were subsequently performed to determine goodness-of-fit of the developed model of the study. This was done in order to determine whether the observed events produced by the model matched expected events. Perceptions of poverty were analysed using 14 indicators within 3 dimensions which are structuralist, individualistic and fatalistic.

The overall Harare multidimensional poverty index developed for the study MPIoH was found to be 0.37, implying that 37% of people in Harare are multidimensionally poor. The multidimensional poverty index calculated for each location was Harare rural 0.50, high density 0.42%, medium density 0.25% and low density 0.16%. The results indicate that the highest multidimensional poverty is in Harare rural (ward 1) followed by wards in Harare high density locations, wards in Harare medium density and lastly Harare low density locations. When cut-off was changed ($k=2$, $k=3$, $k=4$, $k=6$, $k=7$), the multidimensional index produced the following results: 0.40, 0.40, 0.38, 0.37, 0.31, 0.19, 0.07 and 0.01 respectively. Analysis of multidimensional poverty when cut-offs are increased shows that multidimensional poverty decreases. The study reports that 73.8% of households that are currently not poor, are vulnerable to poverty at cut-off above 33% while 24% are vulnerable to poverty at cut-off ranging from 20% to 33%.

The logistic regression found education, health, economic security, environmental and public infrastructure and food adaptability statistically significant in explaining circumstantial poverty in Harare province. Standards of living and empowerment and participation were found to be statistically insignificant. Increase in education was found to decrease probability of poverty by 0.3002 while increase in health was found to decrease likelihood of poverty by 2.019. Economic security improvement was found to reduce chances of poverty by 4.451. Environment and Public Infrastructure improvement would decrease the probability of poverty by 2.629 while Food security and adaptation increase the probability of reducing poverty by 3.139.

Indicators that were found to be significant in explaining poverty are 5-16 years not attending school, school materials/needs affordability, distance (km) from nearest health facility, house size, primary source of cooking fuel, employment status of household head, employment of other household members, household asset ownership, land ownership, nature of roads infrastructure, pollution, skipping meals and borrowing food, or relying on help from friends. The overall poverty for education dimension was found to be 33.8% in Harare province, Harare rural was the most deprived of education at 57.4%. High density was found to be 32.2% education poor while medium density and low density showed intriguing results of 25.5% and 26.2% respectively.

Durational poverty was found to be increasing in Harare province for the period from 2010 to 2020 when poverty head count (P_0), poverty gap (P_1) and severity of poverty (P_2) was analysed for the same period. The highest poverty head count was recorded in Harare rural and lowest in low density. Individualistic, structuralist and fatalistic perceptions were significant in explaining poverty in Harare province. The significant indicators for explaining poverty perceptions for Harare province are: poverty is inevitable and it is part of life; the society lacks social justice; the poor live-in places with no opportunities; the poor are poor because they experienced bad luck and finally households are poor because they have encountered misfortunes.

The drivers of poverty in Harare province were found to be dropout from school by children aged 5-16 years, non-affordability of school materials/needs, long distance (km) to the nearest health facility, small household house infrastructure, poor primary source of cooking fuel, unemployment of household heads and other household members, non-land ownership, poor roads infrastructure, pollution exposure and insufficient food hence skipping meals and borrowing food, or relying on help from friends.

The empirical objectives of adapting the UNDP MPI and developing a multidimensional measure of circumstantial poverty is relevant as new dimensions and indicators were used in this study. Furthermore, the second objective which determined the durational urban poverty for Harare province is rare and has not been used in Zimbabwe and Harare in particular for measuring multidimensional poverty. Thirdly, comparison of poverty among the locations in Harare using the developed multi-dimensional measure provides an informed understanding of circumstantial poverty in the city.

The principal objective of determining the perception of urban poverty in Harare province helped to comprehend what the residents of Harare think poverty is, and this is helpful in informing the

right prescriptions required to fight poverty. The study found that lack of opportunities in poor locations, lack of social justice in the society, bad luck and misfortunate experiences formed perceptions of poverty in Harare province.

The objective of investigating the drivers of circumstantial urban poverty in Harare generates information on what should be addressed in Harare in order to reduce poverty. Recommendations on policies that could be used to reduce urban poverty in Zimbabwe could allow policy makers to fine-tune overarching concerns and tame poverty. Academics and researchers' policy recommendations gain additional epistemic horizons on poverty measurement.

Key words: MPI indicators, durational poverty, poverty perceptions, Harare province, logistic regression.

LIST OF ABBREVIATIONS

ADB	African Development Bank
A-F	Alkire and Foster
ANOVA	Analysis of Variance
BLS	Bureau of Labour Statistics
BMI	Body Mass Index
CA	Capabilities Approach
CALR	Centre for Applied Legal Research
CE	Consumer Expenditure
CEA	Council of Economic Advisors
CMO	Child Mortality Organisation
COREC	Central Office for Research Ethics Committees
COVID	Corona Virus Disease
CSLCPHW	Comprehensive Survey of the Living Conditions of People on Health and Welfare
CSO	Central Statistics Office
CSPI	Correlation Sensitive Poverty Index
DHS	Demographic and health Survey
DSA	Debt Sustainability Analysis
EMS-REC	Economic and Management Sciences Research Ethics Committee
ESAP	Economic Structural Adjustment
ESCOM	Electricity Supply Commission

EU	European Union
FA	Factor Analysis
FAO	Food and Agriculture Organization
FCSU	Food, Clothing, Shelter and Utilities
FGT	Foster, Green and Thornberche
FOD	First Order Dominance
FPL	Food poverty Line
FPR	Fidelity Printers and Refiners
FRESH	Focusing Resources on Effective School Health
GDP	Gross Domestic Product
GNESD	Global Network on Energy for Sustainable Development
GNP	Gross National Product
HRP	Household Reference Person
ICES	Income Consumption and Expenditure Survey
IDM	International Deprivation Measure
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
IMF	International Monetary Fund
K-M	Kaplan–Meier
LIAHEP	Low Income Home Energy Assistance Program
MANOVA	Multivariate Analysis of Variance

MCA	Multiple Component Analysis
MDG	Millennium Development Goal
MDI	Material Deprivation Indices
MICS	Multiple Indicator Cluster Surveys
MODA	Multiple Overlapping Deprivation Analysis
MOOP	Medical Out of Pocket
MPI	Multidimensional Poverty Index
MPSLSW	Ministry of Public Service, Labour and Social Welfare
NSLP	National School Lunch Program
NWU	North-West University
ODK	Open Data Kit
OECD	Organisation for Economic Co-operation and Development
OPHI	Oxford Poverty and Human Development Initiative
OPM	Official Poverty Measure
PA	Participatory Approach
PCA	Principal Component Analysis
PICES	Poverty Income Consumption and Expenditure Survey
PPA	Participatory Poverty Assessments
PPP	Purchasing Power Parity
PQLI	Physical Quality of Life Index
PVO	Private Voluntary Organization

RBZ	Reserve Bank of Zimbabwe
SARB	South African Reserve Bank
SDG	Sustainable Development Goal
SE	Social Exclusion
SNAP	Supplementary Nutrition Assistance Program
SPM	Supplimentary Poverty Measure
SPSS	Statistical Package for the Social Sciences
SRH	Self-Rated Health (SRH
SST	Sen-Shorrocks-Thon Index
TPL	Total Poverty Line
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHDR	United Nations Human Development Report
UNICEF	United Nations International Children's Emergency Fund
UNWFP	United Nations World Food Program
USA	United States of America
VIF	Variance Inflation Factor
WASH	Water Sanitation and Hygiene
WEO	World Economic Outlook

WFP	World Food Programme
WHO	World Health Organization
WIC	Women, Infants and Children
ZESA	Zimbabwe Electricity Supply Authority
ZIMSTAT	Zimbabwe National Statistics Agency
ZPC	Zimbabwe Power Company

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CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

The world has experienced rapid urbanisation since the 20th century (UN, 2010:1; World Bank, 2017; IMF, 2017) and while urbanisation is progress, it is the main contributor to over 1.3 billion global poverty in humans (UNDP, 2019). Urban poverty constitutes 30% of the total world poverty (World Bank, 2019). Urbanisation has caused a profound surge in urban poverty in the form of severe deprivation, high unemployment, malnutrition, formation of slums, lack of proper sanitation and low life expectancy (UN, 2010; IMF, 2017; World Bank, 2017 & 2018:19). Urban poverty is increasing in absolute terms, engulfing more people in various forms. Urban poverty has become the greatest and most urgent challenge to human life (Panori *et al.* 2019:1). The biggest increase in urban poverty is in Sub-Saharan Africa where the rate is such that seven out of any eight countries experience disproportionate intensification of urban poverty (Haddad *et al.* 1999; Mitlin, 2002; World Bank, 2020).

Urban poverty has resulted in overcrowded cities in both developed and developing countries. Poverty is attributed to severe environmental degradation across the globe which causes massive global warming and increased vulnerability to the spread of diseases amongst several other catastrophes such as unprecedented high numbers of deaths (Garland *et al.* 2007). Urbanisation has resulted in poverty shifting from being a rural phenomenon to being a monstrous urban problem given the fact that currently over 60% of population on the globe live in cities. It is projected that by 2045 urban population shall surge phenomenally by 1.6 times to 6 billion. This is likely to cause urban poverty skyrocketing beyond manageable levels (World Bank, 2020).

Poverty is a major undesirable and intolerable global problem. Poverty generates a surge of negative externalities in the form of increasing prostitution, high HIV rates poor societies, illness in various forms and ultimately death (Rodrigo & Rajapakse, 2009; Garland *et al.* 2007). To make matters worse, poverty is most severe in children such that 17 million children suffer malnutrition globally. This means that the various forms of poverty contribute to over 1000 deaths of children under 5 years every day (FAO, IFAD, UNICEF, WFP & WHO, 2017).

The number of people living below the World Bank international poverty line (USD\$1.9 per day) on the universe was estimated at 767 million in 2016 while 2.1 billion people lived below USD\$3.1 a day in 2016 (World Bank, 2016:3). The same agencies have calculated that 75% of

global poverty is in Africa (World Bank, 2018:4). The number of people living in extreme poverty in Sub-Saharan Africa is reported to have increased drastically from 278 million reported in 1990 to 413 million in 2015. Currently, the World Bank statistics show that at least 27 of the 28 poorest nations are in Sub-Saharan Africa (World Bank, 2018:4).

In Sub-Saharan Africa, poverty is so severe such that one in every three people is undernourished or steeped in poverty in one way or the other (FAO, 2016). Such people live desperate lives. In many of the cases, their poverty is intergenerational transmission (IGT) (Bird, 2007: v-10). If these trajectories in poverty are not disrupted through extraordinary and intense global efforts, the World Bank predicts that by the year 2030, the number of people in poverty in Sub-Saharan Africa should exponentially rise to 87% of the global poverty, based on poverty past trends (World Bank, 2018). Zimbabwe was ranked one of the poorest countries at 32 out of 187 in 2017. 87% of its urban population lives in poverty when head count poverty measurement was applied (World Bank, 2017). This indicates an unparalleled catastrophe in poverty in Zimbabwe.

Despite the fact that poverty measurement has been calculated for several centuries spanning from 5th B.C century when Moses measured Abram's riches (absence of poverty) in monetary terms: gold, livestock and money (silver) (Genesis, 13:02), 17th century (Smith, 1776), 18th century; Henry George (1879), Charles Booth (1886-1903) and Seeborn Rowntree (1901), in the 19th century; Myrdal (1957), Orshansky (1969), Townsend (1974) and in the 20th and 21st century by Sen (1976, 1999 & 2000), Ravallion (2003), Son (2004), World Bank (2010 & 2018), Alkire and Foster, (2019), UNDP (2010-2020) and other distinguished scholars, there is still vagueness on what constitutes poverty (what dimensions and how many dimensions to use for poverty measurement). There are equally challenges in vertical vagueness of poverty (how to account for poverty variations from society to society) as Qizilbash, (2002), argues. There is also some murky area with regards how long poverty vagueness should remain in our midst. The anguish and suffering of citizens worsen each moment there is no adequate measure of the phenomenon of poverty. World poverty measures and poverty data methods such as World Bank poverty reports, United Nations Development Programme (UNDP) and Oxford Poverty and Human Development Initiative (OPHI) are all lagging behind in calculating actual urbanisation and urban poverty growth rates. This means poverty is massively underestimated. Such miscalculations are to the detriment of humanity across the globe (Stoeffler *et al.* 2015:429-431; Lucci *et al.* 2016:6). The UN Sustainable Development Goal (SDG) number one for 2030 adopted by United Nations in 2015 designed to "end poverty in all its forms and everywhere" (UN, 2020). Such a noble goal could be futile; so, would be all the 17 UN SDG

2030 goals desired to eliminate poverty if poverty remains underestimated and poorly measured.

This study focuses on multi-dimensional poverty measurement as one method that provides key information for policy formulation and interventions. It strives to focus on a wider spectrum of dimensions and indicators relevant to poverty measurement (World Bank, 2001:6; Botchwayo, 2013:88). Multidimensional measurement enables cognitive, analytical and monitoring and evaluation purposes that go beyond unidimensional poverty measurement methods (Coudouel *et al.* 2002:29). It is unfortunate that most studies on urban poverty such as Tazoacha, (2001); Korankye, (2014); and IMF, (2017) simply focus on causes of poverty, absolute poverty analysis and unidimensional analyses. Evidently, such studies miss earnest multidimensional scrutiny and tracking except for the attempts by UNDP, (2010) & 2018; World Bank, (2018). Even in these assessments, there is a missing element arising from the non-decomposability of some variables, the exclusion of pertinent dimensions and indicators and generalisation of findings (Cellini, 2012; Dotter, 2012; Meyer, 2012; Klasen *et al.* 2015).

Most available literature on poverty in Zimbabwe such as WHO, (2010); Zimstat, (2012 & 2017); IMF, (2017& 2018); World Bank, (2016-2018) are strongly static poverty measurements. An over-reliance on static poverty for analysis fails to give a clear picture of poverty and is rather inefficient and ineffective in giving full analysis of poverty dynamics over time. It is a fact that poverty is dynamic across families, towns, countries and regions over time and space (Cellini *et al.* 2008). There is a strong argument that static analyses and measurement of poverty are the major reason for the failure of the Millennium Development Goal (MDGs) adopted by the World during Millennium Summit in 2000. The aims of the MDGs were designed to reduce poverty by 2015. The contemporary SDGs 2030 could also fail to eradicate poverty if astute measurement approaches remain elusive and poverty imbroglia feral. (Amadi & Ingwe, 2015).

Static poverty analysis does not measure the crucial time variant aspects of poverty such as how probable are people to enter, exit or re-enter poverty. How long do people remain in poverty once they enter it, and what occurrences are associated with people entering or exiting poverty? (Cellini *et al.* 2008; Mpofu, 2008). The overarching patterns, poverty risks, durational differences of poverty in households and the poverty dynamics vary amongst demographic groups and geographical locations. These facets must be fully incorporated in poverty analysis if poverty is to be fully understood and effectively eliminated (Cellini *et al.* 2008). These constructs have not been reported in most recent literature on poverty, Africa included. Examining poverty dynamics and durational circumstances of poverty of households offers

further information as to how, when and why households income and expenditure fall below or rise above poverty thresholds from time to time. This also means there is an absence of factoring the occurrences of non-monetary deprivations faced by households in current estimates of multi-dimensional poverty (Cellini *et al.* 2008).

The most prominent official poverty measure for Zimbabwe poverty is the Zimbabwe National Statistics Agency (Zimstat, 2012& 2017). Zimstat has not attempted multidimensional and durational aspects of poverty for Zimbabwe. This is in spite of the fact that this construct has been in vogue in Zimbabwe since the turn of the 21st century such as 2000-2001, 2011-2012, 2015, 2016 and 2017 poverty reports. The data for Zimstat for both its Zimbabwe Poverty Report for 2012 and 2017 were collected through Poverty Income Consumption and Expenditure Survey (PICES) and Income Consumption and Expenditure Survey (ICES) only Zimstat (2017: 17&26). The findings in these reports are therefore only estimates of money metric aspects. They exclude durational poverty analysis and non-money metric poverty such as social exclusion, gross happiness, political, environmental and wider array of relevant dimensions for poverty measurement. Exclusion of such dimensions and indicators by Zimstat contradicts the ever-growing notion that poverty should be analysed and measured from a multi-dimensional perspective (Hobsbawn,1968; Sen,1979; Nussbaum, 2003; Bourguignon & Chakravarty, 2003; Manuela & Mariangela, 2011; Alkire *et al.* 2014; UNDP & OPHI, 2014 & 2018). This stems from the realisation that poverty has myriad manifestations which vary from one person to the other.

Furthermore, in its own admission, Zimstat concentrated on rural areas and communal lands for the study on Zimbabwe poverty and less on urban population (Zimstat 2017: 37). This is in addition to the fact that the Zimstat (2017) report on poverty measurement was not designed specifically for poverty measurement at all but rather for mere head count income analysis (Zimstat, 2017: 37). This makes the study undependable for researchers to accept this unidimensional approach which was exogenously generalised on urban poverty for Zimbabwe. Nevertheless, and importantly, poverty has degenerated since the last Zimstat poverty report in Zimbabwe in 2017, meaning that further studies are imperative to capture poverty dynamics. Media reports and anecdotal evidence shows that more people could be wallowing in poverty than reported in 2017 given the fact that the economy has been undergoing protracted macro-economic deterioration since 2016 (World Bank, 2019). The multi-dimensional poverty has been further exacerbated by COVID-19 pandemic which saw the economy growth contract extraordinarily to -4.1% in 2020 (IMF, 2020). Zimbabwe Treasury Budget Statement singled out that “COVID-19 pandemic undermined efforts... to attain Vision 2030 (Zimbabwe becoming

upper middle class by 2030) and it is also reported that the country's 2030 SDGs goals are disappointingly off the rails (Ministry of Finance, 2019:10). Circumstantial poverty in Zimbabwe requires astute investigation as poverty exacerbates suffering. Currently, there are few if any studies that have examined multi-dimensional circumstantial urban poverty and measure durational urban poverty for Zimbabwe. The only studies available focus on causes of poverty, urbanisation, determinants of poverty and comparison between rural and urban poverty (Sakuhuni *et al.* 2011). Such studies do not inform policy and strategies for poverty eradication which is an objective of government service delivery in Zimbabwe and everywhere.

It is unfortunate that the most celebrated poverty measure, the UNDP MPI (2018), cannot be fully relied upon for poverty measurement for Zimbabwe as it had only three dimensions of deprivations, each with value of 33.33% and 10 indicators. Other studies have emphasised that poverty indicators that should be used in poverty measurement to improve accuracy are above 40 (Alkire, 2002; Alkire & Foster, 2019: 2). The higher the number of indicators, the better the measure in ensuring the most significant circumstances of human life are included in construction of such a poverty measure. Furthermore, despite the UNDP MPI being applied generically across 107 countries with total population of 5.9 billion (UNDP, 2020), it does not apply to all societies given the varying circumstantial aspects inclusive of geographical and societal standards. The Zimbabwe report did not cater for dimensions and indicators essential in accurately establishing multidimensional poverty.

UNDP MPI calculation is categorised as similar to monetary poverty calculations in that it is insensitive to inequality amongst the poor (Berenger, 2019:200). There is consensus that inequality is one of the worst forms of poverty (Naschold, 2002) and requires investigations for redress. Nevertheless, literature on the effect of inequality on poverty and economic growth is scant (Atkinson, 1997). Most literature and incerppts on inequality available in literature examines monetary aspects (Bourguignon & Morrisson, 2002; Ferreira & Ravallion, 2008).

Furthermore, UNDP MPI report of 2018 for Zimbabwe poverty measurement is challenged because it had only complete data set on Zimbabwe for 2014. The other periods 2013, 2015, 2006 and 2017, are incomplete and the UNDP employed weights which were adjusted at 100% to account for the missing data sets to estimate MPI of 0.149 for Zimbabwe. This makes UNDP findings challengeable and inconclusive as missing data inevitably reduces statistical power and leads to unreliable conclusions (Kang, 2013:1). When data set missing is above 10% (which is the case of UNDP MPI study on Zimbabwe), listwise deletion, single and multiple imputation approaches cannot be objectively applied (Curley *et al.* 2017:595-601). Hence, the imposition of

an exogenously determined poverty line through rudimentary weights for Zimbabwe cannot be used for credible policy formulation and intervention in the case of poverty in Zimbabwe. Resultantly, studies must be advanced to develop a dependable endogenous circumstantial poverty measurement for Zimbabwe which is dynamic in approach and integrates wider dimensions and indicators.

Zimbabwe's own convictions of multidimensional urban poverty have not been technically calculated to an acceptable level but rather remain embryonic. This is attributed to the money metric poverty and static poverty analysis originating from Zimstat (2012 & 2017). Poverty should be defined and measured by the convictions of the society in which it occurs (Hobsbawm, 1968; Sen, 1979). Arising from this observation, it could be tentatively concluded that poverty measurements for Zimbabwe shall remain fetal and questionable if a competent measure is not formulated.

Dynamic and durational multidimensional measure of circumstantial urban poverty identify the actual poor in urban areas and corrective plan action is consequently applied. It also determines if urban poverty is changing and if so, in what direction the change happens over time due to changes in household circumstances. Besides, catastrophes such as COVID-19 pandemic, consecutive El Niño droughts and wide economic contractions since the new millennium have exerted an impact on poverty. According to Baker and Schuler (2004), "the conditions and qualities of poverty are not static." In this vein, researchers cannot rely on static tools in measuring poverty. The pertinent questions in a country such as Zimbabwe is whether urban poverty is a transmission from the Permanent Income Hypothesis, a result of market failures, a consequence of political ineptitude, or perhaps structural poverty. These questions are best answered if the study considers the dynamic approach and geographical aspects of poverty.

A poverty measure that addresses the pertinent issues discussed above is inevitable, as "understanding urban poverty and measurement presents a set of issues distinct from general poverty analysis. [This may] require additional tools and techniques" (Baker & Schuler, 2004). In sum then, poverty analysis and measurement have to include non-material deprivation, welfare and social differentiation and important aspects raised by Sen (1979); Greeley (1994); Wratten (1995); Satterthwaite (1995a); Bird and Powse (2008); Alkire and Foster (2019); Berenger (2019) in order for objective poverty policy formulations that enhances humanity over time and space.

1.2 PROBLEM STATEMENT

Urban poverty is a serious problem affecting humanity. Poverty has been disproportionately increasing in developing countries but most evidently in Sub-Saharan Africa (Odhiambo *et al.* 2005:9; World Bank, 2019:1; UNDP, 2019:1). The experience has now become “a major global urban phenomenon and its growth since the last 15 years is way faster than [the] rural poverty trend” (Garland *et al.* 2007; Panori *et al.* 2019:1). This disquieting trend apparently lacks adequate measurement and analysis arising largely from underestimation and misreporting by researchers. The use of static methods (Lucci *et al.* 2016) does not cater for the complexities of this phenomenon, despite over 1,500 Scopus databases on publications, peer reviewed journals and conference publications on urban poverty (Panori *et al.* 2019:2). This paucity with regards the poverty menace adds to the sprawl because recommendations and policy do not fully understand the ramifications; Tomlinson *et al.* (2008:597) states that “while poverty is widely accepted to be an inherently multi-dimensional concept, it has proved difficult to develop measures that both capture this multi-dimensionality and facilitate comparison of trends over time.” This investigation incorporates a wide set of dimensions in order to develop a multidimensional measure that accurately assess the phenomenon.

There is extensive literature on poverty measurement such as Academic Search Premier (EBSCO), American Theological Library (ATL), A-Z Publication Finder, Scopus (Elsevier), Econlit, Worldwide Political Sciences, JSTOR, Women International Studies, World Bank and United Nations databases. In spite of this, the measurement reported is largely comparative studies between rural and urban locations, poverty in developed and developing countries, country poverty and other various static poverty analyses. Multidimensional urban poverty has been marginalised because on paper, urban dwellers are misconstrued as better off than rural dwellers (Mitlin & Satterthwaite, 2013:6-7). A country such as Zimbabwe whose aim is to reduce urban poverty would want to establish answers to the following circumstantial urban poverty questions: who are the poor, how poor are the poor, where do the urban poor live within the city, what is the nature of urban poverty conditions by various sub groups (race, age, sex, etc.) within the city, are government services serving the poor within the city and if so to what extent, and lastly, are government poverty reduction strategies reaching the poverty stricken areas within the city. Answering these questions is critical, particularly for large, sprawling cities with diverse populations and ever-growing urban poverty (Baker & Schuler, 2004:1) which is the case of Zimbabwe, Harare province. Furthermore, Mitlin & Satterthwaite, (2013:5-7) observe that most available poverty measurement tools such as those used by World Bank and UNDP are suitable for rich countries than poor countries such as Zimbabwe due to circumstantial variations in

aspects of life. This opens space for the urgent development of such a tool to measure multidimensional poverty in Zimbabwe.

Poverty measurements have not provided researchers with an essential aspect on economics of poverty of the twentieth century. For instance, Miltin & Satterhwaite, (2012) contend that poverty measurement is an evil to be concentrated upon. Massey (1996: 96) adds that “poverty is old news”, but its impact is ever degenerating over space and time. Poverty analysis is important. The deliberations that poverty measurement is not important are unfortunate given the conspicuous fact that poverty pandemic keep causing unparalleled suffering to human kind, and in worst cases but very common circumstances death to men, women and children hence, it should be investigated with an unprecedented determination to eliminate it from the universe and this mindset is concurred by (Jalan & Ravallion, 1998:1; Nargis, 2019:15). Hence, correct tools to fight poverty from an informed perspective is lacking in poverty studies and resultantly, poverty keeps degenerating and engulfing more children, women and men on this planet in various forms and magnitudes over time and across the land and sea becoming some sort of intergenerational expletive on humanity. Poverty is clearly a number one killer as it manifests in various forms that kill humans, hence, suave multidimensional poverty analysis is required to stop the scourge and save humanity from various excruciating dimensions of poverty.

Hobsbaum (1968:398) emphasised that poverty “is always defined according to the conceptions of the society in which it occurs.” Society’s conventions are the “matters of fact or the contemporary standards which poverty measurement should consider” and this is closely related to earlier determination by Smith, (1776) on how feelings about poverty differ from person to person. The circumstantial poverty in Harare requires investigations in order to identify and understand the extent of poverty using local standards and direct feelings of Zimbabweans living in poverty. Using Harare’s own set standards on the non-poor standards to determine dynamics of circumstantial poverty across its boundaries eliminates value judgment in poverty measurement. Sen (1979) is one notable researcher who expressed strong disappointment to the notion that ‘poverty is a value judgment’ which can be expressed by researchers such as UNDP, value judgment notion has been ‘forcefully’ presented by various researchers of poverty but it clearly defies logic and is far from reality due to its limited scope and its static approach.

Orshansky (1965:23) defines poverty “like beauty, lies in the eye of the beholder” and this resonates with the ‘voices of the poor’ measurement approach by the World Bank. Both Sen and Onshansky show the importance of listening to the ‘voices of the poor’ to understand

poverty. The message is that poverty should be defined and measured in terms of circumstances faced by the poor in the context of space and time and this is or not sufficiently being pursued.

Despite poverty measurement being in existence since the 17th century when Smith first defined it, poverty measurement remains unclarified (Rein, 1971; Sen, 1981) Yunus (2006:1) posits that “poverty deserves only to be in the museums, where small children can see it in the future and be shocked how we allowed such an inhuman condition to exist for so many people for so long”, but in reality poverty impact is being felt by the majority of people implying it is in our midst and is worth a matter that requires policy makers and researchers to conquer, hence, the clarion call is glaring to everyone that researches are needed to advance poverty fight to augment humanity.

World nomenclature for poverty has changed over the last decades from calling poverty-stricken countries ‘poor countries’ to naming them ‘developing countries.’ Despite these cosmetic changes, multidimensional poverty has not been reduced. Development has not occurred in poor countries. Kuznets (1955) notes that economic development does not ‘raise all boats’ as far as poverty alleviation is concerned. World poverty and these cosmetic inequalities are increasing (Chenery *et al.* 1974; Kakwani; 1993 Ferreira, 2010); this is exponential in Sub-Saharan (World Bank, 2019). Given the general near consensus that poverty has increased, the important question is by how much has poverty increased over time and are the poverty measurement tools relevant to the task at hand? Endogenous measures of the poverty circumstances must be developed to mitigate the scourge. Further delay and procrastination in improving poverty measurement tools and methodology are an unfortunate amongst poverty researchers as poverty kills 25,000 adult people daily (UN, 2020); 6.2 million children below 15 years every year and accounts for a child’s death every 5 seconds across the globe (WHO, 2020). Any single death related to poverty is too many deaths given the fact that poverty is preventable (UNICEF, 2020).

Where studies on urban poverty have been done (Alkire, 2014; Manuela & Mariangela, 2018; World Bank 2016 & 2018; UNDP & OPHI 2010, 2014 & 2018) they have been challenged; firstly, for not being multidimensional enough, secondly for being static in approach, thirdly for flaws in data collection on urban poverty and lastly their lack of attention to circumstantial aspects, scope and non-sensitivity to poverty inequality (Lucci & Bhatkal, 2014; Lucci *et al.* 2016). According to Artha and Dartanto (2018:13) about 62.3% of the population that the monetary poverty measure perceives to be non-poor are actually multi-dimensionally poor.

Monetary measures elide multi-dimensional measures. There is general consensus across researchers (McCulloch, 2003:17; Nargis, 2019:1) that poverty is not static as the extenuating circumstances of poor people and societies change as the economic fundamentals change also. Nargis (2019:1) posits that “households may frequently move in and out of poverty because of their introduction to risk and their capability to manage and handle the risk.” This requires investigation into how people manage poverty risks over time and what happens when they, more so in the case of Harare which has no vivid evidence of such researches.

The UNDP multidimensional poverty index in 2019 estimated global poverty as affecting 1.3 billion people (23.1%) world population; mostly in Africa (72%) of global poverty (UNDP, 2019). There are no clear solutions to urban poverty as and it is ever in an untrammelled increase mostly in Africa. The UN SDGs goal number 1 of 2015 envisions “ending poverty in all its forms” by 2030 and goal number 2 is aimed to achieve “zero hunger by 2030” (UN, 2015). According to the World Bank (2019) poverty is increasing every minute across the globe and exponentially in Africa. It remains an important but unsatisfied fact that poverty measurements should be multidimensional if SDGs are to transform human lives to desired levels (Dotter, 2012; Klasen, 2015; Manuela & Mariangela, 2016; Alkire & Foster, 2019). The UNDP (2010 & 2018) and World Bank methods, both did not address ex post criticisms of excluding circumstantial dimensions and indicators (Cellini, 2008; Meyer & Sullivan, 2012; Klasen *et al.* 2015; Alkire & Foster, 2019). The UNDP MPI remains largely the adjusted head count measure (Alkire & Foster, 2019). Hence there is a strong call by policy makers such as the Atkinson Commission Report on Monitoring Global Poverty for the World Bank to develop further World Bank multidimensional poverty measure to incorporate more dimensions in order to effectively measure poverty (Alkire & Foster, 2019: 2). UNDP conceded that their MPI suffered data constraints in many countries forcing it to drop some indicators such as empowerment. UNDP also accepted that its methodology requires policy makers to refine it by including country specific indicators and welcomed continuous improvement by researchers to improve its efficiency and effectiveness in investigating poverty (UNDP, 2019 & 2020).

Measuring poverty must incorporate all forms of deprivation experienced by people ranging from economic, social and environmental aspects (Hobsbawm, 1968; Nussbaum 2003; Bourguignon & Chakravarty, 2007; Alkire *et al.* 2014; Manuela & Mariangela, 2018). Poverty measurement should be multidimensional because it is a “structuration aspect” (Townsend, 1979) highlighting the routinisation of “the transcending of time and space in human social relationships” (Giddens, 1984). Despite researchers consenting to the notion that poverty is a multidimensional

phenomenon, little has been advanced to include dimensions of poverty into a single poverty measure (Bourguignon & Chakravarty, 2007).

The dynamic nature of poverty advocated in earlier studies by Cellini *et al.* (2008) is missing in UNDP MPI poverty measure and many others. People in urban cities such as Harare experience poverty at one point in time hence, the following questions are investigated in this study:

- (a) To what extent and how long is the urban poverty cycle?
- (b) Why do households fall into poverty?
- (c) What is the nature of urban poverty that households face?
- (d) How does increase in poverty affect the poor?
- (e) Do households face similar poverty (poverty inequality)?

These pertinent questions point to circumstantial and durational poverty. If the questions are answered objectively, most policy prescriptions on poverty fail could identify proper diagnosis to combat poverty degenerative helixes and eventually human death, but unfortunately and more so in the case of Harare progress on the matter is rather minute or unreal to the poverty circumstances bedevilling the societies across its boundaries.

The aspects of durational poverty, likelihood of entry to poverty, exit from poverty and poverty inequality circumstances improve the generation of a multidimensional poverty measure. Leading poverty measures such as UNDP MPI and World Bank measures have concentrated on fewer poverty dimensions and indicators, money metric poverty, national, spatial disaggregation of urban and rural areas with no attention to the dynamism of circumstantial urban poverty analysis (Baker & Schuler, 2004). The circumstantial dynamic aspects of poverty have been neglected as poverty is measured at a single point in time (static). Such static measures do not clarify the actual level of poverty and the poverty cycles experienced by households and in the economy (Baulch & Hoddinott, 2000).

In Zimbabwe, 44.7% of both rural and urban households of Harare province face multidimensional poverty; 73% urban population lives in poverty and of this, 3.8 % are in extreme poverty (Zimstat, 2017:48). Harare poverty requires investigation in order to understand the circumstances and durational aspects of the poverty if it is “to be eliminated in all its

dimensions and forms” by 2030 (UN, 2016) in line with SDG goal number 1 of the United Nations.

Statistics and trends of poverty (for example, Alwing, 2002; Mills, 2002; Taruvinga, 2015) hardly convey the actual magnitude of poverty in Zimbabwe due to inconclusive, inefficient and incompetent data collection and reporting. The main culprit has been identified as the Zimbabwe government statistics agency, Zimstat (Bird & Prowse, 2008) that has not, to date, applied multi-dimensional approach to its poverty measurement besides relying on the UNDP MPI. Lack of a home developed poverty measurement tool for Zimbabwe and Harare in particular makes poverty measurement exogenously determined, leading to poverty analysis becoming a mere academic exercise; indeed, poverty depth and breadth vary with the convictions of society regions or countries hence specific tools should tailor-made for each.

Zimbabwe poverty measurement methods such as of Zimstat PICES and ICES (2017) & UNDP MPI (2018) hardly portray the actual magnitude of poverty and its trend (Bird & Prowse, 2008) as they do not consider non-monetary aspects. They equally ignore anti-poverty efforts by the government and donor community and this systematic exclusion of assistance and resources made available to a household inaccurately portray levels of multidimensional poverty. According to Meyer (2008:1); Xu & Osberg, (2002); Rippin, (2010) & Dalaker, (2017) poverty measurement ought to include all resources available to a given household. The exclusion of any resource violates Sen’s ethically defensible criteria which uses a list of axioms that should be defined.

The calls for multidimensional approach to poverty measurement such as SDGs for action goals by 2030 and the Atkinson Commission Report for World Bank’s monitoring on global poverty compel academics and policy makers to generate viable multi-dimensional poverty measures (Alkire and Foster, 2019). Successful poverty eradication must identify plausibly the urban poor, and indicators to measure urban poverty, determining circumstantial aspects and durational dynamics of poverty (entry, exit and re-entry) to alleviate urban poverty (Coudouel *et al.* 2002; Bourguignon & Chakravarty, 2003).

Poverty analysis and measurement have existed since the 17th century. However, poverty has remained substantially an emotive phenomenon (World Bank, 2018), and in particular, there is limited progress in applying an all accepted and viable multi-dimensional urban poverty measurement method (Dotter & Klasen, 2014) mainly because as noted by Tomlinson *et al.* (2008) the multidimensional poverty aspect has been lost or weakened by inherent distortions such as absence of a systematic methodology that can measure poverty over time, one that

singularly captures all poverty dimensions and indicators. Hence, this study intends to adopt the UNDP MPI methodology and adapt it to include wider dimensional indicators, durational aspects and poverty inequality as suggested by Kanbur (2003) and Mwabu *et al.* (2005:16). The approach allows the study to develop a more accurate and endogenic poverty measure. This has been done in previous studies to improve poverty measurement such as Dotter and Klessen (2014).

1.3 RESEARCH AIM AND OBJECTIVES

1.3.1 The primary objective is designed to model a new multidimensional poverty measure through adopting the UNDP MPI and include additional dimensions and indicators that largely explain poverty in Harare. The dimensions and indicators are mostly derived from the UN Sustainable Development goals for 2030.

1.3.2 The developed MPI for Harare in section 1.3.1 is then used to investigate circumstantial, durational urban poverty and perceptions of poverty in Harare province.

1.3.3 Theoretical Objectives

The ensuing objectives have been constructed in order to achieve the primary objective of the study and these are designed to:

1. To critically review the theories of poverty and their applicability in the context of Zimbabwe;
2. To identify and critique the existing measures of poverty and their applicability in the context of Zimbabwe;
3. Assess theories on trends of poverty and how they contradict based on the different methods and measures;
4. Appraise the existing durational poverty measures and their applicability in the context of Zimbabwe;
5. Evaluate and critique literature on circumstantial poverty.

1.3.4 Empirical Objectives

For the study to meet the primary objective, the following empirical objectives have been developed to:

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province

1. Adapt the UNDP MPI and develop a multidimensional measure of circumstantial poverty;
2. Determine the durational urban poverty for Harare province;
3. Compare poverty among the locations in Harare using the developed multi-dimensional measure;
4. Identify and categorise the perception of urban poverty in Harare province;
5. Investigate and assess the drivers of circumstantial urban poverty in Harare;
6. Develop recommendations on policies that could be used to reduce urban poverty in Zimbabwe.

1.4 SCOPE OF THE STUDY

The thrust of the study is to investigate circumstantial and durational urban poverty by adopting and developing a new multidimensional measure in the case of Harare province. The study adapted UNDP MPI in order to develop its own multidimensional poverty measure. A total of 7 dimensions and 36 indicators were used. Poverty vulnerability was tested to ascertain odds of non-poor households falling into poverty. The study was conducted across all 46 wards of Harare province using data collected through questionnaire at households' level across the wards in Harare using stratified simple random sampling (SRS). The findings were, however, presented by location: Harare rural, high density, medium density and low density. The study applied various cut-offs to determine how poverty reacts as we increased indicator cut-offs. The study performed duration poverty measurement for Harare using Foster (2009) and Alkire and Foster (2012) methods. Poverty perceptions for Harare were determined using structural, fatalistic and individualistic perceptions. The use of location for analysis of results was as a result of small sample sizes in some wards below the minimum sample sizes of 30. According to Central Limit Theorem (CLT) and Martínez, 2014:1, $n \geq 30$ is required to validate a study, which was not attainable in some wards, hence the adoption of locations-based reporting of results.

1.5 RESEARCH DESIGN AND METHODOLOGY

1.5.1 Research Design

Research design is a “set of methods and procedures used to collect, analyse and measure variables in a research problem. It provides a detailed outline of how an investigation is carried

out” (Alavi *et al.* 2018). The most common sampling process steps, in their chronological order according to Malhotra (2010:372), as shown from a-e:

- (a) Defining the target population
- (b) Specifying the sampling frame
- (c) Specifying sampling technique
- (d) Determination of sample size
- (e) Execution of sampling process

The study used quantitative research design to achieve the objectives and the justifications for using quantitative research method are discussed in section 1.5.2. A questionnaire was used to collect data through Open Data Kit (ODK) survey across the 46 wards of Harare.

1.5.2 Quantitative Research Method

The study used a quantitative research design, chosen because it enabled use of questionnaire to collect data for scientific (mathematical and statistical) analysis. This was designed to meet primary objective of the study. The map of Harare was put on GPS as shown in (Annexure B) and wards were demarcated into Harare rural (Ward 1), high density, medium density and low density as shown in (Annexure A1 and A2). Structured and standardised questionnaires were administered to households by mobile data collection devices by research assistants. The households were identified through random sampling technique as done in prior studies (Dudwick *et al.* 2006). Due to COVID-19 pandemic, Open Data Kit (ODK) methodology was the most appropriate in order to reduce human contact by maintaining World Health Organization (WHO) social distancing requirements in addition to masking and sanitisation.

Quantitative research is defined as an investigation of an aspect by gathering data which is then examined using mathematical and statistical approaches (Aliaga & Gunderson 2000). Quantitative research helped in deriving numbers, percentages and measurable figures through computer data packages such as SPSS and STATA (Gorard, 2001:3). Quantitative method permitted the study to produce generalisations on poverty in Zimbabwe based on investigations conducted in Harare province. Quantitative method reduced study bias by enabling “researcher detachment” and maintaining objectivity (Daniel, 2016:92-93).

The study reviewed several empirical studies from Government of Zimbabwe publications, World Bank, IMF, FAO, UNPD, Zimstat, journal, economics books on poverty, bulletins, various media news on poverty, seminal poverty measurement reports and developed hypotheses as commonly required for quantitative study methodology (Neuman, 2006: 14). The poverty measurement methods reviewed include the money metric methods, World Bank method (USD\$ per day), Income and Consumption methods, Asset Indicators and Deprivation methods, Poverty Line methods, Sen's Capability method, Orshansky's method, UNDP MPI, Alkire-Foster M-gamma, B-Ch family, OPHI and Zimstat PICES and ICES. Stratified non-probability random sampling technique was employed to identify elements from the population for the study (Etikan & Bala, 2017). The study used descriptive statistics and econometric models of logistic regression and multinomial logit for poverty measurement and analysis of circumstantial and durational poverty for Harare province.

1.5.3 Population and sampling

Sampling is a systematic selection of representative items, objects or individuals (subset) from the pre-defined population (data source) for investigations, observations or experiments (Sharma, 2017:749). Most "research studies are usually carried out on sample of subjects rather than whole populations" (Banerjee & Chaudhury, 2010:1), and then the sample results are applied to the population. Sampling was preferred because it offered speed in data collection, enabled scope to the study, aided accuracy and reduced research costs (Cochran, 1977:15).

Stratified simple random sampling technique was used to gather data from all wards in Harare locations (Harare rural, high density, medium density and low density). In determining the sampling technique, the study considered the following aspects: the desired 95% level of precision, nature of the homogeneity and heterogeneity across the wards in Harare, financial implications of the study, nature and objectives of the investigation, total population of Harare (finite) and the wards population is also known and have been demarcated by Zimstat (Zimstat, 2017). Furthermore, the results of this sampling were representative of the population (Alvei, 2016).

The target population is the number of elements or individuals of the study (Hair *et al.* 2010:327-330; Taylor & Powell, 1998:1-4). Sampling units are the households' heads or their spouses across the wards in Harare. The study concentrated on Harare province households with a defined 1,581 million residents (CSO, 2017; Zimstat, 2017). Harare has 4 locations which are Harare rural, high density, medium density and low density. Harare urban is made up of 46 wards (Zimstat, 2018) and 400,000.00 households, with average household sizes of 3.9 people

(CSO, 2017). Each location is made of approximately 10 wards. The study used households as its unit of identification for sampling (Zimstat, 2018; UNDP, 2018). Zimstat, (2012 & 2018) gives an average population of 32,609 people per ward. The largest ward is ward 1 which has population of 113,120 while the smallest is ward 46 which has population of 10,482 (CSO, 2017). Annexure A1 and A2 show the maps and distributions.

Zimstat (2017) reported that 93% of the Harare population resides in urban districts (wards 2-46) whilst 7% resides in rural district (ward 1). Ward 1 is Harare South which is a peri-urban settlement facing an inevitable encroachment from Harare urbanisation. In general, males make 48% while females make 52% of Harare population across all the wards.

1.5.4 Pilot Study

Polit *et al.* (2000) define a pilot study as a “a small-scale version or trial run in preparation for the major study. It is used to pre-test or try out research instrument.” The pilot questionnaire reduced data collection errors, logistical glitches and determined if the statistical and analytical processes were efficacious. The pilot study allowed for adjustments that improved validity and reliability of the bigger study by eliminating ambiguity and refining incorrectly structured questions as advised by Baker, (1994); Polit *et al.* (2001).

The pilot questionnaire was administered at 11.4% of the main sample and this is in line with recommendations that a sample should be 10-20% of the population size (Baker, 1994). It represented population in all locations in Harare to ascertain suitability before actual study (Thabane *et al.* (2010); Arain *et al.* (2010).

Due to COVID-19 pandemic, pilot questionnaires were administered in line with WHO guidelines and government restrictions on social distancing, face shields and masks and portable hand sanitisation. The pilot study was done using electronic questionnaires from cell phones, iPad and laptops of research assistants which were remotely linked to the domain server using mobile data or WIFI. The Zimbabwe COVID-19 lockdown curfew and operating hours between 8am to 3pm (Statutory Instrument 83 of 2020) were observed. Government authority to conduct research and to travel for the purpose of the research was secured from the Permanent Secretary of Ministry of Public Service, Labour and Social Welfare (MPSLSW) as per attached letter, Annexure J.

1.5.5 Sample size

Sample size is the number of units, elements or individuals used to achieve the desired empirical objectives of the study (Malhotra, 2010:374). Sample size is crucial feature that aims to make accurate extrapolations about the population investigated (Singh & Masuku 2014:6). Sample size improves the research precision (Zikmund, 2000:64). Gardener (2009:1) submits that sample size should maintain truthful balance such that the study is not underpowered (too few sample subjects) or overpowered (too many sample subjects) all intended to give significance level, power (probability of rejecting null hypothesis) and scale of the variance (effect size) to the study (Singh and Masuku, 2014:6). Sample size should be carefully fixed so that it is adequate to draw valid and generalised conclusions". COREC (2007:1) proposes that "the sample size should be sufficient to achieve worthwhile results but should not be very high as to involve unnecessary recruitment and burdens for participants". Swanepoel *et al.* (2010:200) and Surujlal (2004:144) all suggest that a sample size (n) greater than 30 is ordinarily sufficient to validate a study.

In order to achieve the right study balance on the objectives of the study, the sample size was determined using Cochran's minimum sample size formula (Cochran, 1977) which was accepted and adopted by several studies (Fowler, 2002; Bartlett *et al.* 2001; Gill *et al.* 2010; Taherdoost, 2016). The formula for determination of sample size used in this study is shown below:

$$n = \frac{Z^2(P(1 - P))}{e^2}$$

Where:

n is the required sample size;

Z corresponds to the level of confidence required or accuracy of the results;

P is the % of occurrence or the level of precision;

E is the % of maximum error required.

The main advantage of using this formula is that it gives study precision and estimation of level of risk to the study (Bartlett *et al.* 2001). The total numbers of households in Harare were found to be 400,261 (Zimstat, 2017).

Study sample size calculations

1.88	3.5344	0.5	0.5	0.05	0.0025	359
Pilot study sample results (n =11.4%)						41
Total sample size for the study (n)						400

Researcher's own calculations

Based on this formula, the sample size was 400 elements drawn across all the wards of Harare. Probability proportion to size (PPS), was based on each ward number of households hence, location results represent the ward in the respective locations. Each household in any of the wards across locations has an equal chance of being sampled using stratified (locations wards) simple random sampling (households). The sampling technique is discussed in detail in the next section.

1.5.6 Sampling technique

This study used primary data to investigate urban poverty in Harare province which was collected through questionnaire at all locations of the 46 wards through stratified sampling (location wards) and simple random sampling of households. The selected seven research assistants possessed a minimum Honours Degree in Economics, Statistics and substantial research experience in using Open Data Kit (ODK) method. The study used the statistics from the CSO (2017) and Zimstat (2017& 2018) to obtain population in each ward and the set sample size and boundaries. For boundaries, the study consulted Harare City of Harare Town Council office for electronic map with coordinates, GPS and demarcations of wards which were then uploaded onto the research tool. The Harare map used is shown in Annexure B.

Selected research assistants were adequately trained on post-graduate research data collection in line with North West University guidelines, research ethics (NWU ethics clearance, minimum risk status of the study, anonymity of subjects, confidentiality of the data, subjects' consent and their right `not to participate. The researcher trained the research assistants on data collection during COVID-19 pandemic in line with WHO guidelines.

1.5.7 Mode of quantitative data collection procedures

Electronic data collection for the quantitative surveys was done through ODK mobile survey questionnaires which were linked to a central server for the study. ODK is an "open-source suite of tools that helps organisations and authors to manage mobile data collection solutions" (Illinois. Edu). This method is common in developed and developing countries (Brunette *et al.*

2017; Bokonda *et al.* 2019). ODK system uses internet data enabled cell phones tablets and computers (iOS and Android enabled gargets) to relay data from various locations to a central server (ODK Aggregate Server). ODK, like any other near real time data collection options offers the following advantages to the study over pen-and-paper methods:

1. Elimination of interviewer errors associated with filling out questionnaires.
2. ODK enabled use of GPS for remote tracking of research assistants.
3. It also enabled data collection on other media such as voices and capturing pictures when required.
4. A set of quality control checks were conducted continuously throughout the fieldwork.
5. Data processing and finalisation took less time compared to pen-and-paper surveys. ODK uses centralised data collection system and this improves data time, security and data management.
6. ODK reduces time required for large data collection and capturing. It is also cheaper when collecting large data.

Generally, primary researches have been severely affected globally by the CODID-19 pandemic (Leach, 2020). Adherence to WHO guidelines and Zimbabwe Government restrictions on COVID-19 policies were followed without compromise. None of the research team members contracted COVID-19 virus as exposure was minimised. WHO guidelines on COVID-19 that were followed include human social distancing, personnel undertaking the study were provided with face masks and face shields and portable hand sanitiser and adherence to the COVID lockdown curfew gazette of operating hours between 8AM to 3PM.

The choice for the dimensions, indicators or cut-offs were determined by current and ongoing participatory public deliberations, use of dimensions and indicator variables that have been approved through public consensus, assumptions of what is important to people, authoritative conventions such as UN SDGs, data availability and lastly empirical evidence (Artha & Dartanto, 2018: 3-14; Kim, 2018:1112). According to Coudouel *et al.* (2002: 30), computing poverty measure requires choosing the appropriate dimensions and indicators and developing the poverty framework for analysis and applying the multidimensional measure.

Collected data were analyzed using SPSS and STATA as recommended for this type of study by (Ong & Putech, 2017). Analysis was performed using various statistical methods including

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logistic regression, multinomial logit and other statistical methods as done in prior studies (Ravallion & Chen (1997); Achia *et al.* (2010). Statistical output analyzed includes descriptive statistics, diagnostic tests, odds ratios, correlation, canonical correlation, ANOVA and MANOVA.

The multi-dimensional poverty in this study allocated weights to dimensions and also specified cut offs for dimensions. The multi-dimensional poverty measure also factored durational and poverty intensity (Alkire *et al.*,2014). Most poverty analyses and measurements have been a matter of imposition of an exogenously determined poverty line which can either be too frugal or irrelevant as it leaves a number of important conceptual, methodological and philosophical aspects unresolved. This study therefore invested in a multidimensional measure of poverty that encompasses circumstantial durational aspects.

1.5.8 Literature review

To investigate multidimensional, circumstantial and durational poverty, literature review was conducted through national, regional and global studies that performed multidimensional poverty measurements at district level (region within a province), provincial, national, regional and global level. The literature review relied on the Internet, textbooks, magazines and published journal articles. A notable contribution to this study was from the work of UNDP, World Bank, IMF, OPHI and Zimstat at the start of the 20th Millennium.

The study analysed existing Income and Consumption methods, Asset Indicators and Deprivation methods, poverty Line methods, Sen's Capability method, Orshansky's method, UNDP MPI, Alkire- Foster M-gamma, B-Ch family, OPHDI and Zimstat PICES and ICES. Literature review added value to the study regarding multidimensional poverty measurement. The review indicated the existing research gaps, specifically dimensions and indicators in the selection of indices.

1.5.9 Inclusion criteria

The Alkire- Foster (AF) cut-offs (Alkire & Foster, 2014), similar to the UNDP MPI, was applied in this study. Respondents sampled were households' heads or spouses of the household heads above 18 years. For inclusion in the study, elements must have stayed continuously within their given wards or worked in Harare for over 6 months. The 6-month period was chosen to exclude visitors to the province who would lend a patina of bias to the study. Respondents who were based out of the province but permanently staying in Harare were represented by their spouse.

All responses received through ODK electronic devices before 30 September 2020 were included in the study.

1.5.10 Exclusion criteria

People below 18 years were ineligible and household members who were not household heads or spouses were excluded from the study. Essentially, households without household heads or spouses present during sampling were excluded from the study. Responses not linked to the ODK server were automatically rejected. Alkire- Foster cut-offs (Alkire & Foster, 2014) were applied in the construction of the MPI from data collected and hence was the main mode for exclusion of non-poor.

1.6 ETHICAL CONSIDERATIONS

Given the fact that this involves humans, ethical contemplations stipulated by Wilson (2011) were prioritised by researchers. Sekeran (2001) defines ethics as morals, conscience or integrity of conduct on what ought to be moral or immoral; right or wrong. Ethical matters give researchers dutiful accountability on accuracy and honesty when undertaking research (Wilson, 2011). This study was performed accurately and with highest integrity. In addition, this research adhered to ethical guidelines formulated by the North-West University. Ethical Clearance was approved with minimum risk by North West University EMS-REC (NWU 00785-20-A4) before any data collection process commenced (see annexure S). After ethical clearance, the researcher sought authority from Government of Zimbabwe through the Ministry of Public Service, Labour and Social Welfare (Annexure J) under which the study falls. The study was approved (Annexure K). Participants' permission was sought before participants were recruited to participate and informed consent was obtained from all participants. Participants were assured that their identities would remain anonymous and that their responses would remain confidential even after the finalisation of this work. The information provided is used for the purposes of this PhD study and research articles derived from this work.

1.7 SIGNIFICANCE OF THE STUDY

Multidimensional poverty measurement lags behind mostly in developing economies (Mitlin, (2012); Mitlin and Satterthwaite (2013), and Zimbabwe in particular. The available studies on multidimensional poverty (Zimstat, 2012, 2017) are mainly income metric measures. There has not been a multidimensional poverty measure for Harare hence this study adds new epistemic horizons on measuring poverty in Harare. Furthermore, durational poverty measurement and

analysis have remained in the bud and where applied, it has remained limited in scope due to fewer dimensions and indicators being used. Such studies have also been static in approach. Poverty can only be broken if the poverty durational cycle is clearly understood, which is one of the objectives of this study. Besides relying on UNDP MPI, there are no studies in Zimbabwe that have sought to advance the UNDP MPI poverty measurement despite calls to researchers and academia. Hence, this study strove to add to literature by improving on dimensions and indicators which are endogenous to people in Harare province, Zimbabwe. The chosen dimensions and indicators were constructed into a single multidimensional poverty measure.

1.8 DELIMITATION OF THE STUDY

The study focused on Harare province for its multidimensional poverty measurement. Data were collected from the 46 wards of Harare (1 rural ward and 45 urban wards) grouped into 4 locations. The data were collected from household heads or their spouses only. Households whose household heads or their spouses were absent during sampling time were eliminated from the study.

1.9 CONCLUSION

Poverty measurements have remained largely money metric phenomenon and these have resulted in failure to administer the rightful poverty elimination tools across the globe. Poverty is a multidimensional vice with tentacles everywhere, causing suffering and death. It should be approached and measured using a multidimensional perspective. This chapter discussed the research gap in the problem statement. The chapter further discussed both the theoretical and empirical objectives of the study. The main imperative is to adopt UNDP MPI and develop a new multidimensional poverty measure for Harare that takes into consideration more dimensions and indicators of poverty. The chapter introduced the research design for the study as well as methodology. The ethical considerations and study delimitation were also discussed. Chapter 2 discusses the literature review and from this generates a theoretical framework for the study.

CHAPTER 2: LITERATURE ON THEORIES AND MEASURES OF POVERTY

2.1 INTRODUCTION

This chapter addresses the following objectives of the study:

1. Review the theories of poverty and their applicability in the context of Zimbabwe;
2. Identify and critique the existing measures of poverty and their applicability in the context of Zimbabwe;
3. Assess theories on trends of poverty and how they contradict based on the different methodologies and measures;
4. Identify and evaluate the existing durational poverty measures and their applicability in the context of Zimbabwe;
5. Identify and evaluate literature on circumstantial poverty.

Theories of poverty are important in the face of high global poverty as they give practical direction required to change the trends. “Theory makes it possible to focus on poverty, frame the discussion so that poverty is at the centre, rather than at the margins, or off the radar entirely” (Stark, 2009:388). In this respect, theories enable modelling of concepts, helping in predictions and analysis of testable inferences using specific cases as reported in literature (Brady: 2018:2). Theories of poverty are essential in the context of global poverty for the same reasons that theory is necessary in any system of law...theory enables us to map connections and their lacunae” (Stark, 2009:388). Separately, it is acknowledged that there is some semblance of progress in poverty measurement although still lacks the expected robustness. Some researchers have strongly argued that theories of poverty are largely incomplete. Sawhill (1988: 1084-1114), for example, posits that:

We are swamped with facts about people's incomes and about the number and composition of people who inhabit the lower tail, but we don't know very much about the process that generates these results... From a more scientific perspective, we still understand very little about the basic causes of poverty until more complete theories and models of the process by which income is generated and distributed are developed and tested, the answers to some of the questions raised [remain uncertain].

This is an observation that is strongly inclined to monetary poverty measurements, buttressing the point that poverty measurement theories are incomplete. Brady concurs to the point that poverty research up to now lacks theory (Brady, 2018:2) and lack of theoretical constructs is one factor that has seriously derailed the elimination of poverty (Desmond & Western, 2018).

This study identifies various forms of poverty and secondly, in order to effectively analyse economic theories of causes of poverty and poverty measurement, it is imperative to define poverty. Such a discussion clarifies how certain schools of thoughts define poverty (Davies & Martinez, 2014:6). The first point is that poverty and inequality are closely related (Miler & Boby, 1971) hence, the study utilises the terms inequality and poverty interchangeably. Poverty has been defined in both absolute and relative terms. The absolute definitions are inclined to monetary approaches whilst relative definitions of poverty provide a better understanding of various dimensions of poverty. The study assesses various schools of thought on theories of poverty, measurements and perceptions of poverty. Various measures of poverty have been developed since the 17th century. However, most measures of poverty are unidimensional despite the fact that scholars and researchers concur that poverty is a multidimensional phenomenon. Unidimensional measures make the construct less effective in poverty eradication as it systematically ignores other pertinent aspects affecting people's wellbeing that ought to be addressed. Furthermore, static poverty analysis and measurement tools have largely been used to define and measure poverty and they have failed to achieve desired targets. This is so because poverty is a moving target. Measuring this dynamism in poverty entails dynamic tools. In most cases, durational poverty methods are not applied, making the official measures in a country like Zimbabwe quite specious. Valid durational poverty measurement and analysis enables policy makers and researchers to extrapolate astute time series analysis of poverty. This obviously requires more time and continuous data collection. The study benefits from a large body of literature on theories of poverty, even though these have been applied to developing countries (Davies & Martinez, 2014:5).

2.2 POVERTY DEFINITIONS

The term poverty originated from Latin word *pauper* for poor and has etymological roots in *pau* and *pario*, meaning being born with nothing in terms of economic assets and inheritance (Korankeye, 2014). The study defines poverty in absolute and relative terms in the next section. Poverty definitions are differentiated later relative to whether they are unidimensional or multidimensional.

2.2.1 Absolute poverty

Absolute poverty occurs as a result of insufficiency of goods needed for someone to meet basic standards of living. The basic goods needed for human life are human right needs, including aspects such as shelter, food and water. Adam Smith (1776) defined absolute poverty in terms of necessities, not merely commodities which are important for normal human life, but customs of the society for decent wellbeing. Absolute poverty analysis uses income lines to measure if a household or individual consumption fall below the minimum standards defined by the society for one to be non-poor. Rowntree, (1902: 86) defined absolute poverty as ‘inadequacy to obtain the minimum necessities to enable human physical efficiency.’ Noble *et al.* (2007: 54) defines absolute poverty as “impoverishment which is defined independently of any reference group. It does not change according to prevailing living standards of a society, or over time, or according to the needs of different groups in society.” In other studies, Aguayo *et al.* (2005) summed absolute poverty as “the cost of purchase of essential goods to reach minimum levels of coverage of basic needs. Its main limitation resides not contemplating the level of economic development and the relativity in the choice of the indicators in each country.”

Absolute poverty can further be broken down into primary and secondary poverty classes. Primary poverty arises due to inadequate provisions of basic needs for decent life while secondary poverty is a result of wasteful behaviour of households or individuals or purchase of non-essential goods. Secondary poverty entails that there is sufficiency but wasteful behaviour that leads to poverty.

Orshansky (1963) advances the notions of absolute and relative poverty to come up with a ‘relatively absolute measure’ for USA. The relatively absolute measure is a concept of measuring poverty that classifies the poor into various poverty thresholds of poverty.

2.2.2 Relative poverty

Relative poverty measures how inferior a person or household is when compared to others in the constituency or society. The concept measures society’s inequality and not poverty severity or vulnerability to mortality (Mowafi & Khawaja, 2005). Townsend (1992) defines relative poverty as the incidence of poverty at which a person or household fails to undertake their normal functions in their society or people are constrained to pursue behaviours customarily expected of them in society. Aguayo *et al.* (2016) asserts that “relative poverty lines weight the population based on a given measure of distribution, generally the median income, since to offset revenues better reflects the situation of most of the population. The poverty threshold is set to a

percentage of the median income (40–70 and 20–30 % for severe poverty), at which a person is considered poor.” Poverty should now be defined more in relative form than absolute because relative deprivation encompasses comparisons of income [on] poverty lines (Wilkinson, 1996).

Relative and absolute poverty on their own do not effectively define poverty as they both rely on income to determine poverty and its measurement. Both definitions fail to consider the different and unique needs of households or individuals within society or from society to society. The use of absolute and relative poverty measures do not therefore fully describe poverty across countries and regions (Sen, 1983).

2.2.3 Unidimensional Poverty Definitions

Definitions of poverty have been largely related to income and the use of income concepts. This still remains at the epicentre of poverty definitions under unidimensional poverty analysis and measurement. Poverty is defined as a condition of inadequacy or a combination of human material, social, cultural and political facets of human life (UNDP, 2006:5-6). Philosophers such as Aristotle define poverty “as a condition of what is needed to achieve *Eudaimonia* or the good life” (UNDP, 2006:6), while the World Bank, former President Robert McNamara, defined poverty as “a condition of life below human decency in which individuals face malnutrition, people are illiterate, community face diseases, some households live in squalid environments, human life characterised by high infant mortality and low life expectancy” (Singer, 2004).

Karl Marx in the 18th century defined poverty historically and morally as occurring when a “country at a given period, the average quantity of means of subsistence necessary for the labourer which is practically known” Karl Marx (1887:150), and this indicate an undimensional measurement. Sen (1979:286-289) defines it as condition ‘that is disapproved for normal human life and which, elimination is morally and essentially a good deed.’ Sen goes further to distinguish between absolute and relative poverty. Nonetheless, the definition has been changed recently to include social justice or relative privation regardless of the living standards being experienced. In current parlance, poverty is defined as a condition of inequality in society rather than insufficiency being experienced by an individual or household (Sarlo, 2019:11). Contrary to his 1979 assertions, Sen (1983) defines poverty as primary poverty (lacking basic needs of life) and secondary poverty (mis-allocations resources on luxuries than necessities of finite resources).

Adam Smith (1776:251-352) defines poverty in terms of necessities of life when he compares the Greek and Roman lifestyles several years before the invention of clothes. Adam Smith’s

definition of poverty shows how this phenomenon evolved over time due to changes in lifestyle. He categorically emphasises that:

By necessities I understand not only the commodities which are indispensably necessary for the support of life, but whatever the custom of the country renders it indecent for credible people, even of the lowest order, to be without. A linen, shirt, for example, is, strictly speaking, not a necessary of life. The Greeks and Romans lived, I suppose, very comfortably though they had no linen. But in the present times, through the greater part of Europe, a credible day labourer would be ashamed to appear in public without a linen or shirt, the want of which would be supposed to denote the disgraceful degree of poverty which, it is presumed, nobody can well fall into without extreme bad conduct.

Valentine (1968:1) defines poverty in relation to inequality when he says “the essence of poverty is inequality.” Poverty is here defined in terms of exclusive set of societal norms and values from society (country) to the other and the circumstantial intricacies and perceptions of poverty also varies within society (country) and culture (Morton *et al.* 2014). Goldsmith and Blakely (1992:18) factor in different perspectives to the definition of poverty when they clearly differentiate three forms of poverty which are: “poverty as pathology”, “poverty as incident or accident” and “poverty as structure.” in all, there is evidence that poverty is understood differently, hence the need for this study to adopt a multidimensional approach rather than a unidimensional one.

2.2.4 Definition of Multidimensional Poverty

Poverty has long been defined as a multidimensional phenomenon bedevilling the human race. For instance, Aristotle’s definition of poverty provides a multidimensionality aspect to it. He posited poverty as related to welfare and wellbeing in terms of happiness, pleasure and prosperity which imply absence of poverty:

Another belief which harmonises with our account is that the happy man lives well and does well; for we have practically defined happiness as a sort of good life and good action. The characteristics that are looked for in happiness seem also, all of them, to belong to what we have defined happiness as being. For some identify happiness with virtue, some with practical wisdom, others with a kind of philosophic wisdom, others with these, or one of these, accompanied by pleasure or not without pleasure; while others include also external prosperity (Aristotle, 1994 [350 B.C.E.]: 34).

Various definitions of poverty have evolved since the 17th century. Initially poverty was defined in the long past as a condition of suffering from unhealthy levels of deprivation of basic necessities “which are indispensably necessary for the support of life” to whatever “the customs

of the country render indecent for credible people and the lowest order to be without” (Smith, 1776).

Adam Smith earlier had defined poverty to encompass a range of non-monetary aspects such as pain and unfavourable circumstances faced by people in society. He postulated poverty to mean:

Nature, when she formed man for society, endowed him with an original desire to please, and an original aversion to offend his brethren. She taught him to feel pleasure in their favourable, and pain in their unfavourable regard. The reason poverty causes pain is not just because it can leave people feeling hungry, cold and sick, but because it is associated with unfavourable regard (Smith, 1759:132).

This confirms that poverty has a multidimensional aspect. The point of contest is that poverty has been measured in unidimensional fashions to this day. Further and various definitions of multidimensional poverty stem mainly from Sen’s *Capabilities Approach*. In this approach Sen (1999:87) defined poverty as “the deprivation of basic capabilities rather than merely as lowness of incomes, which is the standard criterion of identification of poverty.” O’Connor (2001) used a definition closely related to Sen:

A deprivation of basic capabilities for normal human life, as science or knowledge of inequality that indicate existence of disparity of status and interest that make poverty concept an inescapably political act, as an exercise of power by the educated elite to classify, stigmatize, to neutralize the poor and deprived, it involves analysis of factors that obscures the political nature of social and economic inequality existing in the society (O’Connor, 2001:12).

Sen defined capabilities as “substantive freedoms a person enjoys to lead the kind of life one appreciates” (Sen, 1999:87). United Nations Human Development Report (1998) defines poverty to mean resource scantiness and deprivation of normal life choices for decent living while, Yunus (1994) summarises poverty phenomenon to mean denial of human rights required for the fulfilment of basic human needs and happiness. Yunus adds that “poverty deserves only to be in the museums, where small children can see it in the future and be shocked how we allowed such an inhuman condition to exist for so many people for so long” (Yunus, 2006:1).

Slattery (2018) defines poverty in terms of unwanted circumstances [that] people face; in terms of wellbeing and she later compares [the] life of people in poverty and non-poor. Her assertions are that:

We don’t all need the same thing, though. In order to have and sustain wellbeing, it is necessary to make sure that people have what they need. This is equity. Having the

needed resources to achieve well-being is noticed as lacking for people in poverty as compared to people who do not live-in poverty, consequently leaving poor people less healthy and with compromised well-being because they have fewer resources (Slattery, 2018:70).

UNICEF (2004) produced a clear construct of multidimensional poverty in children to include various dimensions such as spiritual resources, emotional resources, their enjoyment of human rights, needs for the development and full and equal participation in community that these children are part of. This UNICEF concept of multidimensional poverty is closely related to capabilities deprivation of intrinsically important aspects of human life. Capabilities approach expounded by Sen defines poverty to mean more than income but a multidimensional lack of resources by individuals, households or countries to reach the wider needs for human life.

Further discussion on capabilities approach comes under theories of poverty. The concept of multidimensional poverty has now been extended by various researchers and agencies, including UNDP, who have actually adopted Sen's definition of multidimensional poverty. The 1990 Report (UNDP, 1990:1) defines poverty multidimensionality in terms of the Sen's Capabilities approach for the first time by accentuating that:

This report is about people - and about how development enlarges their choices... is about more than GNP growth, more than income and wealth and more than producing commodities and accumulating capital. A person's access to income may be one of the choices, but it is not the sum total of human endeavour. Human development is a process of enlarging people's choices. The most critical of these wide-ranging choices are to live a long and healthy life, to be educated and to have access to resources needed for a decent standard of living. Additional choices include political freedom, guaranteed human rights and personal self-respect. Starting with this perspective, human development is measured in this report not by the yardstick of income alone but by a more comprehensive index-called the human development index (HDI) - reflecting life expectancy, literacy and command over the resources to enjoy a decent standard of living.

UNDP further defines multidimensional poverty in terms of deprivation of human opportunities UNDP (1997:18) through linking lack of basic material well-being needs, lack of opportunities and choices required for human decency and development in aspects such as living standards, enjoyment of liberties, dignity, self-esteem and respect for others in the society. The UNDP has extended its poverty definitions in light of Sen's Capabilities approach such that in its UNDP report in 2000, UNDP defined poverty in terms of "human development [as] the process of enlarging people's choices, by expanding human functionings and capabilities. Human

development thus also reflects human outcomes in these functionings and capabilities. It represents a process as well as an end” (UNDP, 2000:45).

World Bank defined poverty in terms closely related to UNDP but included freedoms (2009:17) affirming poverty to be:

Hunger, is lack of shelter, is being sick and not being able to see a doctor, not having access to school and not knowing how to read, it is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water; it is powerlessness, lack of representation and freedom.

In further researches, World Bank defined poverty in absolute terms as living beneath one USD\$-a-day (World Bank, 2018). The World Bank definition was derived from Stark (2009) who conceptualised poverty as living below a dollar a day. Bradshaw (2006) emphasised the findings by Townsend (1979: 31) who suggests that poverty is a general lack of ‘necessities for shared values of human dignity and participation in society they belong’. In further studies, Townsend (1992) defined poverty as deficiency (absence) of income for people to “play the roles, participate in the relationships, and follow the customary behaviour which is expected of them by virtue of their membership in society.”

United Nations (UN, 1995:18) defines poverty widely to include various dimensions and indicators when it contextualised poverty as having various manifestations such as lack of income, lack of resources needed for productivity for sustainable human life, occurrence of hunger and malnutrition, poor health in the form of sickness or other ill- health aspects, lack of education, lack of access to safe housing, unsafe environments, suffering social discrimination and exclusion in society. In worst cases, it defines poverty to mean increased mortality, hopelessness, homelessness, lack of full participation in social, economic, political and civil activities of the economy which they are part of. Poverty can also be defined as increased morbidity due to lack of support from the society. Multidimensional definitions of poverty indicate that poverty is a broad concept which combines social, economic, cultural, political and environmental aspects.

Other important aspects of multidimensional poverty include empowerment, happiness, fear and freedoms all for human life. These ever-morphing definitions of multidimensional poverty now encompass more dimensions related to the ultimate enjoyment of human life. Hence, definition of multidimensional poverty entails that poverty is likely to exist in main societies whether developed or developing. Later, United Nations Department of Economic and Social Affairs (2005,14) defined multidimensional poverty in terms of two dimensions required for normal

human life: lack of economic activity due to poor income and secondly lack of political or social voice stemming from unavailability of social support services, sufficient information on opportunities. United Nations Department of Economic and Social Affairs concluded that lack of economic empowerment and social- political power degenerate to repudiation of human rights and discrimination of others in the same society or across societies which are manifest forms of poverty.

UNDP is the most common producer of multidimensional poverty in Zimbabwe, however ADB, UN & World Bank, (2019:19) together undertook a multidimensional poverty measure for Zimbabwe and concluded that:

The Multidimensional Poverty Index (MPI) for Zimbabwe also suggests that poverty was a little higher in 2011–12 than in 2001, but it peaked in 2007. It rose from 2001 to 2007, following the deep economic crisis of the mid-2000s, and then dropped again in 2011, although it remained above 2001 levels. The MPI for Zimbabwe does not directly use consumption as a welfare measure but instead considers levels of education, health, employment, housing conditions, living conditions, assets, and access to services. Unlike monetary poverty, the MPI does not require price information, which makes it easier to make comparisons over time, especially when the period of evaluation covers a period of hyperinflation. Multidimensional poverty is much higher in rural areas than in urban areas, and the impact of the crisis in the mid-2000s on multidimensional poverty was particularly felt in rural areas.

The above assertions require further analysis of multidimensional poverty using a wider array of dimensions. But it is clear that from various scholars that poverty is multidimensional pandemic that has stayed with people the longest of all evils. It is a diverse and an unfortunate phenomenon that affects the human race in various monetary and non-monetary aspects. All said, poverty can be eliminated. Poverty hinders satiation and full enjoyment of life human life and has done so since time immemorial. Poverty includes unhappiness, bodily pain, lack of freedoms, lack of access to quality services and goods as well as shortage of a spectrum of needs required for human life at all times.

2.3 THEORIES OF POVERTY

The first objective of the study is to critically review the theories of poverty and their applicability in the context of Zimbabwe. This objective is addressed in this section. According to Brady (2018) theories of poverty are the general framework with economic core principles of explanatory variables that enable predictions of testable causes of poverty. The poverty theory embraced has a direct effect on the public policies used to redress poverty (Schiller 1989:4). Theories explore why poverty exists and specifically why some members of society are poor

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province

and others are non-poor. Poverty theories are divided into behavioural/ cultural, structural and political theories as promulgated by various schools of thought. These include: Classical, Neoclassical, Keynesian, Marxist, Social Exclusion and Circumstantial schools of thought.

2.3.1 Cultural/ Behavioural theories of poverty

The cultural/ behavioural theories explain poverty by using the link between culture and race as causes of social dysfunction (Glazer, 2000; Jordan, 2004:19). The proponents of this theory contest that poverty is a result of social and behavioural weakness in households and individuals that ostensibly cause deficiencies in their economic productivity. According to Rodgers (2000) individual behaviour reinforces culture which creates, maintain and transfer from generation to generation a culture that reinforces the numerous forms of social and behavioural deficiencies. Continuous welfare by government in the form of cash handouts to able bodied-adults creates a culture of dependence on aid which then perpetuates a dependency syndrome. This generally degenerates into poverty amongst households. The theory can be subdivided into culture of poverty and behavioural theories and this is explained in the sections that follow.

2.3.1.1 The Culture of Poverty Theory

Lewis in 1966 propounded an anthropological disposition which ascribed blame for poverty on behavioural deficiencies in the form of rising divorce rates, increase in feminine headed single families, teenage pregnancy, alcohol abuse, illicit drug uptake and felonious activities to the poor themselves or the government (Jordon, 2000). The theory's pertinent aspect was to test whether poverty is generationally related (Lewis, 1966). Nonetheless, there have been preconceived beliefs and misconceptions that Lewis blamed the poor for poverty (Patterson, 2000; Harvey & Red, 1996:1). In fact, Harvey and Red (1996:1) noted that Lewis' theory of poverty is not bent on poor-bashing, a Marxist ideological strategy:

...Lewis's work is a celebration of the resilience and resourcefulness of the poor, not a denigration of the lower class and the cultural defences they erect against poverty's everyday uncertainty (Harvey & Red, 1996:1).

Lewis attempted to explain the culture of poverty using sociological and anthropological methods to ascertain poverty of the “the economically and politically deprived population whose behaviour, values and pathologies are adaptations to their existential situation” (Gans, 1967:116). The fundamental aspects of the culture of poverty are the disengagement, non-integration and discrimination of the poor from main institutions of the economy. The theory

states that poverty creates a way of life that becomes a culture which is learned and shared then socially and economically transmitted as basic traits, norms, values and behaviour of a social group, hence poverty is an adaptation of cultural anthropological set aspects of the larger society.

People in this subculture (small society within the broader economy) isolate themselves from main society and the poor life they suffer is perpetuated from generation to the next through absorption of the social aspects of the group by children. The cycle of poverty emanating from this poverty is difficult to escape and it consequently affects children (Patterson, 1994:119).

The culture of poverty is not only a function of deprivation to human needs or disorganization or lack but it relates to a culture in the traditional anthropological aspect in that 'it then designs style for human life and proffers solutions for problems in people's lives hence it is a significant adaptive function' (Lewis, 1966). The Culture of Poverty is witnessed from one society to another thus it surpasses national, regional and international boundaries. It is evident for comparisons between rural and urban societies. The theory shows remarkable similarity in structure of households, similarity in family income spending patterns, families value system, interpersonal relations and family's orientation of time. The theory emphasises that ethnic groups behaviour patterns such as high incidence of common law marriage or increase in women headed households both at national, regional or international groups have no role in shaping the culture of poverty. This is because diverse households express strong traits in similar behaviour in the culture of poverty in different family set ups, thereby rendering attributes such as female headed families, slavery and others immaterial aspects in explaining the occurrence of poverty.

The culture of poverty method combines sociology, anthropology and psychology techniques in order to obtain information on variables including employment profile for households, household income and expenditure patterns, household assets, friendship patterns mainly the godparent of the household, social security for children, recreational activities of the household, health and medical history of the family members, politics, religion, worldview, area of residence, family relations and cosmopolitanism. The theory recognises the interrelated nature between both culture and personality.

The preconditions for defining a culture of poverty society

1. A cash economy anchored on profit
2. Persistently high unemployment rate in the economy

3. High underemployment at very low wages for unskilled labour
4. Voluntary or involuntary lack of political, economic and social organisation in the economy
5. Being of a bilateral kinship system in managing the affairs of the economy
6. Existence of a nuclear progenitive family for a kinship system
7. The dominant class determine values for thrift and accumulation of wealth
8. High mobility
9. Poverty or low-income status is a result of personal inadequacy and inferiority of the individual.

Where all the above set of conditions exist, the way of life for the poor is basically driven by a culture of poverty which is also called the subculture of the Western social order. The Culture of Poverty can be defined as an adaption and or reaction cycle of the deprived that perpetuates itself as people are class-stratified into poverty marginal positions and they get so much individuated in the capitalistic society. Thus, for example, children of young ages dwelling in poverty-stricken societies such as slums subconsciously absorb the basic attitudes and values of their sub-culture and the values become so much ingrained in them to the extent that they are not willing to take any opportunities that could develop from time to time from the larger society. Culture of poverty is local poverty institutionalised by the larger society institutions and agencies to the extent that the poor are not qualified for services because they cannot afford the services, are ignorant of the services, they are suspicious of the services, fear of the unknown, apathy or development of institutions and procedures for ways of life in the subculture economy. Figure 2.1 clearly highlights the principal dimensions of the culture of poverty.

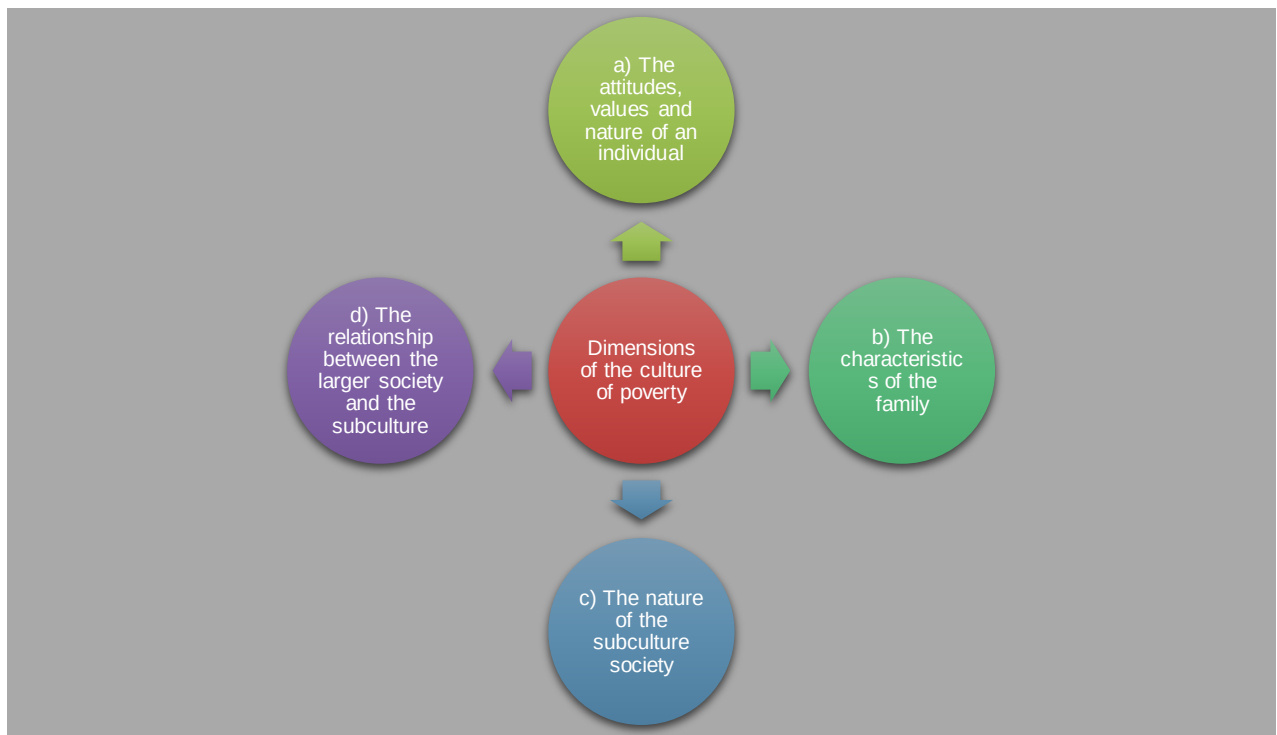


Figure 2-1: The principal dimensions of the culture of poverty

Source: Researcher's own presentation

People living in a culture of poverty society do not have financial inclusion access; do not belong to trade unions or political parties, hospitals, large stores and museums, hence they only access services such as jails, army and welfare institutions. The subculture of poverty perpetuates their poverty and hopelessness. The people of a subculture also produce goods with little commercial value hence their propensity to wealth is very low. They face serious unemployment and underemployment, receive low wages incommensurate to effort, they do not accumulate property, they have no savings, there is rampant pawning of personal belongings. There is high incidence of usurious interest rates borrowing in the informal market to which they belong and also, they use second hand items such as clothing, furniture and fittings. They face food shortage as they buy in small quantities; they face serious cash shortage and imprisonment. Such a vicious cycle degenerates into and perpetuates intergenerational poverty (IGP) through transmission.

People in the culture of poverty often fantasise and claim wealth in the middle class and they tend to prefer consensual unions than civil or church marriages. This gives people in poverty culture the freedom of association and access to divorce options at any time they deem fit. Women in this subculture tend to claim ownership of children they have and children are core to

their social settings. The people in this subculture have strong hatred towards police, they have traits of mistrust towards the government and people in high positions and are cynical towards the church institution and its values. People in this subculture possess strong desires for protest and entertainment in the political movements against their current status quo. According to Lewis (1966) the people in culture of poverty live in poor housing, which is overcrowded; they exhibit gregariousness towards each other but have little to no organisation beyond family nucleus and family's extended family. There are informal groupings and gangsterism in the whole neighbourhood. More often family members do not like their childhood as it represents confinement rather than the protected stage. The families are more inclined to the mothers who happen to have the authority to rule and the extended families of their mothers and there is little privacy within the family due to limited space. Limited resources in most cases lead to rivalry amongst siblings within a family as material affection is highly prized.

The slum dwellers in the culture of poverty often have strong fatalism behaviour, helplessness, dependence attitude, exhibit inferiority complex and weak egos. Furthermore, people in this setup lack a clear sexual identity, they have little disposition against gratification, they have huge tolerance for any psychological pathology and have no tangible plan for their future.

There is strong male superiority and it is made obvious through masculinity. However, the men have little sense of history of their community and worse, they have no knowledge of the world outside their territorial boundaries. They exhibit lack of vision although they are status conscious. In general, such societies have low technology but they are a strong united force to urban rebellion.

According to Lewis (1966) culture of poverty thrives under free enterprise, capitalism and colonial societies but is mainly made by an integration of people from lower income strata. Zimbabwe's economy is not a free market hence the theory cannot be fully applied to this context. It is difficult to eliminate culture of poverty but it is proposed that redistribution of wealth, reorganisation of the poor, psychiatric treatment and addressing the traits of culture of poverty help in eradication of the vicious cycle of poverty.

The theory is mostly used in USA and UK as a major "explanatory tool" to understand aberrant behaviour in youth and for criminology and sociology (Blackman, 2014). There is no evidence it is used as public policy in Zimbabwe but the theory could explain the characteristics of Harare's informal economy. Due to high unemployment, Harare is now largely a city running on an informal economy. People in the informal economy basically lack savings and formal banking services such as borrowing at low interest rates. The high interest rates as high as 50% are

preferred by lenders because people in informal sectors such as market places at Magaba, Mbare, Musika, Gazaland and other places in Harare do not have security for borrowing. This implies that most people in the informal sector are financially excluded and over 77% of them are unbanked (Fincscope Consumer Survey, 2017; Masiyandima *et al.* 2017). Chivasa and Simbanegavi (2016:1) confirm that: “Financial exclusion is rampant in Zimbabwe especially after the hyper-inflationary and unemployment periods.” In most cases people end up pawning personal belongings in order to raise some capital for re-order or start up an informal business. The informal sector of Harare is often overcrowded and without basic needs such as ablutions and clean running water. The products produced are of low commercial value and largely belong to the recycle industry.

However, theory was mostly used in the 1960s to shape social and economic policy but was dropped in the 1970s due to lack of connecting evidence between its dimensions and poverty existence (Sameti, 2012). The theory of the culture of poverty have been criticised (Gans, 1971; Mandell & Schram, 2003; Rank, 2004) mainly for holding the poor responsible to their poverty instead of determining the primary causes of poverty that the people face. In many contexts, this theory remains a weapon used by politicians to justify poverty in the society. Davis and Martinez (2014) challenged the theory and labelled it ‘biased’ in interpretation of attitudes and common patterns among poor people and their societies. They also concluded that the findings were from an uncontrolled, individual-oriented research which left many individual values and beliefs unobserved (Davis & Martinez, 2012:21). This theory fails to give exact boundaries and quantification between the subculture poor and the rest of the poor. Further, the model also shows inconsistencies in applying poverty and the theory’s inclination towards cultural self-reinforcement does not capture fully the causes of poverty. It is one theory where poverty is largely a matter of basic conditions or social order in the country investigated (Massey & Denton, 1993).

The assertions of Lewis have been attacked, his assumptions of existence of disorganised, disoriented and a fatal society are out of context as all societies strive to achieve growth but are often limited by economic resources. Stack, (1974:23) said that:

The culture of poverty notion explains the persistence of poverty in terms of presumed negative qualities within a culture: family disorganization, group disintegration, personal disorganization, resignation, and fatalism. An underlying assumption of the culture of poverty notion is that the social adaptation of the poor to conditions of poverty would fall apart if these conditions were altered. It is assumed that the subculture would be left with no culture, or with wholly negative qualities.

Lewis has been criticised for either by “design or inadvertence” for the common interpretation of his theory of subculture poverty that blames the victim (Valentine, 1968:29; Howe, 1998; Jordan, 2000). If the subcultures causing-poverty can easily be identified, then why not ban them in order to stop poverty degenerating and its transfer as a policy instrument that benefit the society? The applicability of Lewis’ theory in a society such as Zimbabwe and Harare in particular has been further challenged as it is seen as a “pejorative tradition” typically targeting black families related to the Frazier studies of the Negro families (Harvey & Reed, 1996:470). However, the theory was used in the 1990s and empirical evidence such as the Moynihan Report contended that poverty is caused by destitution and inability to develop good habits such as sacrifice, cognitive reasoning, judgment and education which are needed for one to prosper (Myron & Magnet, 1993; Jordon, 2000). Rank asserts that: “the focus on individual attributes as the cause of poverty is misplaced and misdirected, economic mismanagement of the economy, political ineptness, and social system failures are the topmost causes of poverty” (Rank, 2004:50). It is in this light that there is need to look into other competing theories of poverty to establish what causes poverty and how it should be eradicated.

Lewis’s theory of culture of poverty does not focus on poverty eradication at all but targets “eradicating a deviant subculture that offends bourgeois sensibilities” (Harvey & Reed, 1996:470). It is dismissed as a theory that cannot be relied upon to reduce poverty in a society and this is the point that Valentine (1968: 20) makes:

Ultimately, [Lewis] is saying that the alleged culture patterns of the lower class are more important in their lives than the condition of being poor and, consistently, that it is more important for the power holders of society to abolish these lifeways than to do away with poverty - even if eradicating poverty can be done more quickly and easily (Valentine 1968:20-24).

According to Howe (1998), Lewis’s theory has been severely criticised and undergone a series of revisions because the theory is a mere description of low-income societies and cannot be applied objectively as an anti-poor policy.

Narayan *et al.* (2009) concludes that poverty is not solely a product of culture because every human being seeks success and dreams of it, hence the theory of culture of poverty does not explain the struggles people undertake to break the vicious cycles. Indeed, poverty is a condition which will ultimately be broken when opportunities are created in the form of employment, economic development and emancipation or human development. Dube (2019:58) concurs with the convictions set by Narayan *et al.* (2009) above that humans seek

success and undergo various struggles to break poverty. These struggles are not represented by this theory.

The applicability of Lewis' theory is a futile endeavour because he supports the capitalists to destabilise poor communities and accuses them of causing poverty, contrary to the perspective that poverty eradication requires government policies and programmes designed specifically for the poor (Valentine 1968:76). These notions are supported by Harvey and Reed (1996:471) who estimate Lewis as a "bourgeois reactionary guilty of the sin of psychological reductionism when it comes to understanding poverty, its root causes, and its root cure."

In a separate study, Leacock (1971) raised concerns on the applicability of Lewis theory of poverty. She regards low class culture and cultural deprivations as notions that enable poverty distortions. She posits that:

... However, some of the writings by anthropologists and other behavioural scientists, that deal with concepts as "lower-class culture," "cultural deprivation," and the popular "culture of poverty," have contributed to distorted characterisations of the poor, and especially the black poor. The fact is that, through the "culture of poverty" and similar notions, the nineteenth-century argument that the poor are poor through their own lack of ability and initiative, has re-entered the scene in a new form, well decked out with scientific jargon... (Leacock, 1971:10)

The existence of subculture society is a debatable assumption. Leacock (1971:11) further advises that existence of a culture of poverty that is self-multiplying and in which immediate satiation and gratification overtake. This means there is an underlying political aspect which tries to justify the reasons some people are poor while others make it in life (Harvey & Reed, 1996:472). It is passe that politicians would want to justify that raising wages for the lowest paid and the poor would not end poverty. Stack (1974:23) charges that it is not always easy when incomes of the poor are raised, poverty would be reduced.

Applicability of Lewis theory is further questioned by Rigdon, (1988); Harvey& Reed (1996), specifically questioning the data Lewis used for his theory. The assertions are that Lewis distorted his data to suit his preconceived ideas of a capitalist economic system. According to Rigdon (1988:125), Lewis's theory is porous because:

Lewis wanted to convey to readers precisely those observable aspects of his informants' lives that had so influenced him. During the last ten years of his career, this objective affected both his choice of informants-those would most graphically present their lives to readers-and of format. The underlying message sent to readers was no longer, "This is

what I have come to understand about how poor people live their lives," but rather, "This is what I have seen; don't you see the same things too?"

Due to its weakness, Lewis's theory has become peripheral in discussing poverty in recent debates (Harvey & Reed, 1996) as researchers look further to the myriad challenges regarding applicability of Lewis culture theory of poverty in societies. Some studies (Rigdon, 1988; Harvey & Reed, 1996) applied Lewis's methodology but found different results to Lewis hence the theory has been relegated as scholars and researchers look beyond Lewis's theory.

2.3.1.2 Behavioural/ Decision Based Theory

Behavioural theory states that poverty is necessary to motivate people to work and without poverty no one would work. This is called the "virtue of work" (Davies & Martinez, 2014:18). Poverty is seen as a necessary evil for people to participate in the workplace. People who do not work suffer from poverty and this is emphasised by Bertrand *et al.* (2004) and Durlauf (2011) that poor people in society are poor because they engross in non- and counter-productive activities which increase their poverty risks. Kaida (2015) concurs that the presence of people exhibiting such counter-productive behaviours increases poverty. It was also found that poor societies are in general culturally heterogeneous causing behaviours in the form of drugs abuse, sexual problems in adolescents and negative educational behaviours (Harding, 2010). Poverty is caused by economic decisions which are a result of inefficient (Davies & Martinez, 2014).

Behaviour is the chief source of poverty (Sawhill, 2003) and poverty is high in societies that exhibit poverty-enabling behaviour (Cruz & Ahmed, 2018). Individuals sometimes lack dexterity, good work ethics or astute morality or possess little education for the competitive market place, which requires continuous personal development of skills. The proponents of the theory isolate government as having no role in poverty cycle but pins poverty on personal traits and not market forces. Poverty then is a choice through which people's weaknesses, individual efforts and capabilities contradict the market forces obtaining at any given time (Townsend, 1979). The proponents of the theory concluded that helping the poor is an unnecessary action. Nonetheless, the most suitable way of assisting the poor is through charity relief to registered organisations. People actively influence their productivity outcomes with little to no political and or social influence and such choices limit them from accessing economic resources and tend to raise their poverty risk exposure (Blank, 2010). The proponents of this theory advocate for removal of subsidies as a tool to fight poverty and deprivation. According to Kasarda and Ting (1996) it is recommended to employ small measures for welfare transfer and alleviate poverty or

avoid the poverty trap in circumstances where people lack incentive to work. However, Blank (2010) advocates for creation of development programmes over simple poverty alleviation, promotion of education achievement than mere subsidies and vigorous implementation of time limited financial aid which should be tied to work requirements.

The proponents of the behavioural poverty postulate that using subsidies to alleviate poverty results in demoralisation of other people who are willing to work. They subsequently withdraw their labour because poverty is a result of personal choice, hence people who are initially not poor will now identify themselves as poor just to be free riders and for them to access free benefits and welfare transfers. Figure 2.2 below shows measures that could be used to alleviate behavioural poverty.



Figure 2-2: Measures to alleviate behavioural poverty

Source: Researcher's own presentation

The behavioural theory was applied in the UK between 1979-2001 on increased single mothers' incentives. The increase was stirred by an increase in joblessness among this group; however, different results were obtained for US during the same period. The conclusion for the US negative response to the theory was that the increases in social benefits were less than employment benefits people derived from working (Davies & Martinez, 2014).

The only evidence of behavioural poverty being applied in Zimbabwe was through a study by Kamoyo and Makochehanwa (2018) where they tested impact of poverty, risk aversion behaviour, time preference, marketing of maize preferences in Zvimba and Makonde districts in Mashonaland West province. The study used 433 maize farmers from the two districts. The study confirmed that risk aversion attitudes and market timing by the farmers were key behavioural aspects in avoiding poverty amongst farmers.

Behavioural theories remain largely theoretical formulations with little application (Brady, 2018:9). The policy framework proposed for behavioural theory is also criticised for ignoring market failure as proposed by the Neoclassical Theory. Furthermore, unemployment and joblessness can be a function of collapse in aggregate demand as highlighted by Keynesian theory or could be a result of Marxist theory. Behavioural theories have been criticised for uncertainty regarding poverty causality that the theory posits and furthermore the causal order the theory establishes is not clearly explained (Streib *et al.* 2016).

It has also been noted that the relationship between behaviour and poverty is unreliable (Rothwell & McEwen 2017) for instance, the largest body of literature on behavioural poverty is on single mothers (Brady, 2018:9). However, it has been noted that “single motherhood is not even significantly associated with poverty in 19 out of the 29 rich democracies” (Brady, 2018:9) and another study by Bloome (2017) concluded that there is no evidence of the relationship between single motherhood parenting in children in households and poverty.

Furthermore, behaviourists’ have also failed to explain the existence of macro level poverty (Heuveline & Weinshenker, 2008; Brady, 2018:9-10) as inter-national occurrence of poverty cannot explicate cross-national disparities in poverty (Brady *et al.* 2017; Brady, 2018). In the light of this discrepancy, there is need for further studies into the relevance and explanatory power of behavioural poverty theories (Brady, 2018:11).

2.3.2 Neoclassical Theory of Poverty

First propounded by Alfred Marshall in 1890, the theory argues that economic structural rigidities create barriers through insidious obstructions that make it difficult for some groups of people in society to create wealth (Sarlo, 2019). In other words, poverty is blamed on “macro- and meso-level demographic and economic contexts representing available opportunities and constraints” (Brady, 2018:12). The economic theory uses the perfect competition equilibrium where people’s initial asset endowments such as talents, skills, capital, financial and labour are employed at set prices for a pareto optimality allocation (Davies, 2007; Davis & Martinez, 2014).

Korankye (2014) asserts that poverty has foundations in structural factors obtaining in the economy and economy's interconnected institutional conditions that favour others by race (i.e., black or white), class (i.e., institutional racism), gender (patriarchal) or location (i.e., rural or urban; high density or low density). These facets create economic barriers for others. The theory asserts that people by nature have different levels of initial assets endowments, implying they have different productivity levels. People who are less productive are prone to poverty. The central argument is that poverty is driven by market failures resulting from negative externalities, adverse selection, moral hazard, economic shocks such as recession, uncertainty, death in a family of breadwinner, sickness and family breakdown due to divorce or impromptu and forced migration and separation (Davies & Martinez, 2014). The theory assumes the government has no important role in explaining the occurrence of poverty in the society. The theory attributes poverty to factors as shown below in Figure 2-3 that follows.

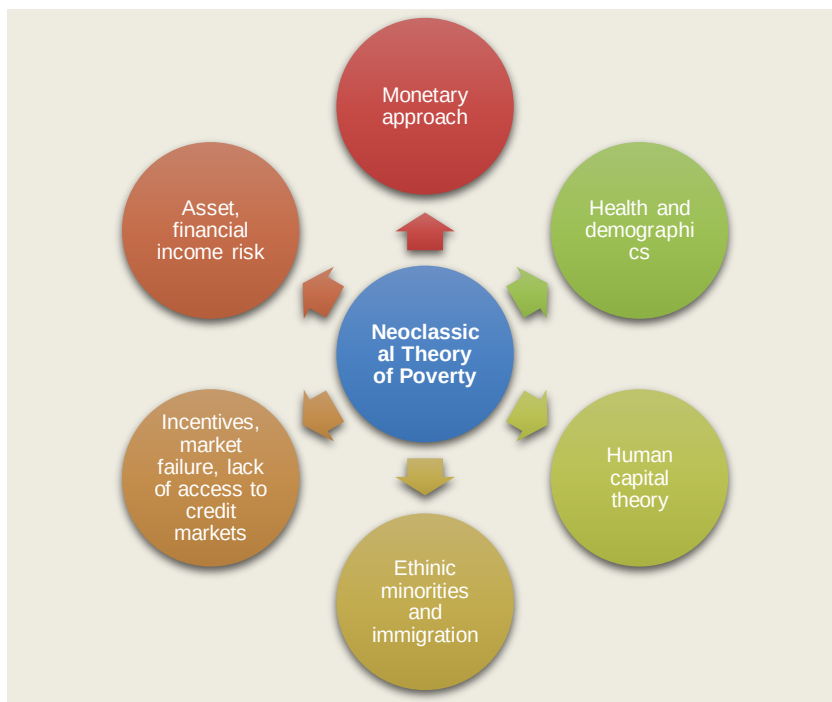


Figure 2-3: Neoclassical Theory of Poverty schools of thought

Source: Researcher's own presentation

The neoclassical theory explains how structural and demographic characteristics cause poverty and this happens in three ways as noted by Brady (2018:12):

First, indirectly, structural contexts cause problematic behaviour, which causes poverty. Second, these structures directly cause poverty, even net of behaviour. Third, structural contexts interact with behaviour to moderate the behaviour-poverty relationship. Hence,

structuralists differ from behaviouralists because economic and demographic contexts do not solely operate through behaviour.

Structural poverty arises when economic fundamentals interrelate with isolation to cause poverty which is common in urban areas (Tach & Emory, 2017). Also, some researchers and in particular Harding, (2010); Wodtke, (2013) singled out neighbourhood effects as a cause of structural poverty. An example is children born and bred in disadvantaged communities who are stressed through physical violence that then affects their educational attainment leading to poverty (Brady, 2018). It has also been proved that industrialisation and economic development reduces poverty (Sawhill, 1988; Brady, 2018). It was also noted that increase in employment opportunities increases chances of poverty decrease. In a separate research, Rainwater and Smeeding (2004: 130-134) conjectured that “the most important step in reducing poverty among children is to ensure that at least one parent is employed” because “individual level employment is influenced by the structural economic context.” The structural economic context has both direct and indirect consequences on individual’s poverty. Conversely, other structuralists accentuate the negative effect of industrialisation on poverty. For example, it has been reported in prior studies that “poor are marginalised by economic growth” (Brady, 2018:14). However, this has been disapproved by various studies (Kuznetts, 1955; Kaldo, 1965) that argue that industrialisation reduces poverty as it leads to automatic spill-over effects to the poor.

A case in study in Zimbabwe is the Economic Structural Adjustment (ESAP). Zimbabwe liberalised its economy during ESAP in 1991. This programme resulted in structural changes to the economic fabric of the country. There was a rapid contraction of the economy which caused huge unemployment across the various sectors of the economy (Marquette, 1997). Kawewe and Dibie (2000:44) submit that ESAP which was introduced in Zimbabwe with technical support from World bank and IMF led to high inflation in the country during 1991-1995. This caused the economy to be prone to economic shocks. ESAP simply made workers worse off, it led to higher environmental degradation and multidimensional poverty increased in both towns and rural areas. These facets generated serious social economic crisis in the country.

Structural changes and government activity are blamed for the hyperinflation of 2008 that resulted in a rise in unemployment in Zimbabwe. The structural theory of poverty is challenged because it is closely associated with behaviour; the explanatory variable is structural whilst behaviour is the dependent variable (Brady, 2018). Since there is no other scope, the challenges of behavioural theory automatically apply for structural poverty theory. Brady (2018) proposed that researchers wishing to advance structural poverty must integrate structural

differences of context (over time and place) and structural design and secondly establish how structural poverty to other leads to poverty causes.

The neoclassical theorists disagree as to how economic growth reduces poverty. Kuznets (1955) posits that spill-over effects during economic growth automatically cause the poor to obtain resources that reduce their poverty. In an alternative interpretation, Kakwani (1993) and Bourguignon (2003b) advised that the spill over of resources to the households of the poor during economic growth is not systematically automatic and obvious. In this respect, poverty cannot be expected to suddenly and directly dissipate during economic growth across all households and citizens at the same extent. Later, Bourguignon (2003) produced further analysis of the neoclassical theory of poverty using the “the poverty-growth-inequality triangle” showing that economic structural changes (growth) lead to inequality than end poverty. This makes the theory incomplete and complicated in explaining poverty. Meier and Stiglitz (2001) proposed that the theory be supported and supplemented by other theories in order to objectively explain and proffer policies that reduce runaway poverty across the globe. To deal with the incompleteness of neoclassical theory, Kralješević (2014) proposed addition of economic emancipation and freedoms omitted by economists who endorse neoclassical theory. The findings from the neoclassical theory show that neoclassicalists do not agree on the effect of economic growth on poverty eradication. Stiglitz (2001) suggests consulting other theories to bolster the neoclassical theory as far as explaining poverty is concerned.

2.3.2.1 The Monetary Approach

The theory was expounded by Laderchi *et al.* (2003) from the Rowtree (1901) poverty income methodology. This monetary approach defines poverty to be a function of consumption obtained from current income available to individuals or households. Income for consumption is a function of marginal productivity. An increase in productivity increases income earned by labour. Monetary theories of poverty have largely dominated poverty discourse since the 17th century (Sumner, 2007) including the leading institutional researcher on poverty, World Bank (Roelen, 2017). The proponents of the monetary approach show that households possess identical preferences and needs and they are totally individualistic and utility oriented in behaviour and approach (Davies & Martinez, 2014). The theory contends that government should improve the level of GDP which would directly increase wages and also this would directly increase employment amongst the poor. The vicious cycle enhances economy wide macroeconomic improvements as increase in wages and employment of the poor raises their income. Consequently, the poor afford basic goods and necessities of life which improve their health

among other spill-over effects. According to this theory, consumption is vital for poverty analysis and poverty eradication policies employed by government. Furthermore, according to Balla (2002) income is primary in poverty alleviation as it gives the poverty-stricken households and individuals' purchasing power that addresses inequality in the society. Income from the state would then aid the poor by giving them access to public goods.

The monetary approach is also extended to non-market goods and services by apportioning monetary value to these goods and services. Poverty is defined as total consumption of individuals using household's income or their expenditure. People whose income or expenditure falls below the minimum set standard benchmark would then be defined as poor. This is the key definition of poverty followed by World Bank. The monetary approach is groups citizens into primary poverty if below standard poverty line or secondary poverty if above.

Monetary approaches have used to explain Zimbabwe's poverty measurement. The Zimstat ICES of 1995, ICES 2001, PICES 2011-2012 and PICES 2017 measure monetary poverty (Zimstat, 2017:20). Zimstat used the ICES and PICES to measure and compare poverty between rural and urban population. The main variables used included productive assets, sources of income and employment types (Zimstat, 2017:21-23). The study on monetary poverty concluded in 2017 shows that 42.5% of national households were income poor and households that had a formal working member were 20% less poor than a household without a member employed in the formal sector.

The monetary approach has been criticised in that the definition of poverty does not encompass all aspects important to human life. Poverty is a multidimensional aspect which requires factoring in non-monetary poverty circumstances and indicators. This remains the single weakness of the income poverty. Furthermore, the theory assumes uniformity in monetary metrics but effectively elides the households' and individuals' heterogeneity and their contextual situations (Davis & Martinez, 2014).

Also, the approach ignores shocks that people face over time such as recession, retrenchments, divorce, sickness, childbirth and changes in aggregate demand or aggregate supply which affect income and expenditure patterns over time. Essentially, this monetary approach ignores assets variable in the form of debt accumulated, wealth and savings acquired by individuals and households and price variations that exist in different geographical locations among other important factors that can define poverty and inequality. The theory fails to include social services provision mainly from government (public goods) and development partners (donor assistance) and their role in ensuring wellbeing. The other weakness of the theory is the

uniformity needs treatment of nutrition needs. By nature, people have different metabolism, activities, different gender orientations hence their dietary needs are not uniform. It has been noted that the theory data focuses on individuals but is collected at level henceforth, this makes the theory biased in defining poverty. Finally, the theory uses value judgments which then are exogenously applied without the actual involvement of the poor in the formulation and implementation of the model.

2.3.2.2 Assets, finance and income

The neoclassical theory on assets, finance and income uses social exclusion to determine asset scarcity. The theory asserts that people that hold sufficient assets are less susceptible to income volatility while households with fewer assets are more susceptible to fluctuations in their incomes. Effectively this entails that people with less income are prone to poverty from negative income shocks while people with high income are safe from income and financial risk.

Ulimwengu (2008) argues that lack of income diversification as a result of holding insufficient assets increases the households' chances of being swerved into poverty trap when the job is not long term or unsecured. He adds that household is vulnerable to shocks which is very deterministic characteristic of poverty-stricken families. Furthermore, health and education are poverty-proofs. In general, the poor cannot make savings and are financially excluded, do not have life insurance policies and have no pension funds which can stabilise them in the event of death of breadwinner or loss of employment. The proponents of the theory advocate for social security to mitigate the effects of risk of income fluctuations. In conclusion, the poor lack human capital, education and good health, fixed capital formations, natural capital hence they are more prone to poverty risk.

This model was used by Larochelle *et al.* (2014) during Zimbabwe's hyperinflation of 2007-2008. The researchers used actual assets held by the households as prices were too volatile to measure poverty. Larochelle *et al.* (2014) asserts that "in the face of inflationary pressures, such as those experienced in Zimbabwe during 2007-2008, use of household consumption measures to assess poverty is difficult, if not impossible. With monthly inflation rates exceeding 10,000%, the real value of consumption expenditures will depend on exactly when the product was purchased". Larochelle *et al.* (2014) in their study on Zimbabwe poverty during 2007-2008 further argued that "asset index overcomes liabilities associated with expenditure-based measures, such as price deflation to address differences over time and space, and lessens recall and measurement error biases". Use of assets or financial entails households with some levels of assets are less susceptible to poverty and households with some level of assets have

a good representative of permanent income as asserted by the Permanent Income (Filmer & Pritchett, 2001).

The main weakness of this model is its failure to relate information and asset ownership in single asset index. This discrepancy is addressed by studies using principal component analysis (PCA), factor analysis (FA) and multiple component analysis (MCA) in the case of Zimbabwe.

Larochelle *et al.* (2014) proposed asset index used for Zimbabwe as follows:

$$AI_I = \sum_{j=1}^n w_j a_{ij} \dots \dots \dots (1)$$

where *AI* represents asset index for the household

a_{ij} is the asset ownership status for the household

w_j are weights to be estimated.

The weights are estimated using “correlation structure and correspond to the eigenvectors of the first principal component of the covariance matrix” (Larochelle *et al.* 2014).

Larochelle *et al.* (2014:232) applied the asset theory to measure poverty in Zimbabwe using “the value of all foods, other non-durable goods and directly consumed services, such as education and health, are included, as are flows of consumption values from ownership of durable assets, the value of housing services for owner-occupied housing, and values of gifts, transfers and remittances.”

Two poverty lines were constructed using 2001 price data: the food poverty line (FPL), corresponding to the food basket providing at minimum cost household food energy needs, and the total poverty line (TPL), which accounts for non-food basic needs. Households with real per capita consumption expenditures below the TPL are considered poor and those below the FPL, extremely poor”.

The theory was used to identify permanent poverty households in Zimbabwe but could not explain geographical spread of poverty. Further studies in Zimbabwe were done by Hoddinott (2006) who assessed how “households with varying income levels used livestock holdings in the face of rainfall shock to understand the influence of the shock on the human body mass index (BMI) of people. The study concluded that households with higher animal stock holding were less affected by poverty which emanated from severe drought. In the case of Zimbabwe, Hoddinott (2006) was criticised for using a single shock to measure poverty and excluding

important variables such as insurance. Furthermore, critics show that the assertions were inconclusive given the fact that study was “restricted to rural resettlement areas in Mashonaland Central Province, in Mashonaland East Province and Mutanda in Manicaland Province” (Bird and Prowse, 2008).

The weakness of this theory is that it does not measure transitory poverty as assets are normally a long-term strategy for households. Shocks experienced in households such as droughts, tsunamis, financial crises and pandemics such as COVID-19 could result in households holding assets in the short run. Furthermore, although the proponents of the theory indicated that poverty is a multidimensional concept (Larochelle *et al.* 2014:232). In essence, the theory has limited scope as some dimensions of poverty cannot be quantified using income. These include freedoms as proposed by Sen’ CA theory that is a non-monetary aspect of poverty.

2.3.2.3 Incentives, market failure and access to credit markets

According to Banerjee and Duflo (2012) there are three fundamental explanations why poor people make decisions that increase their poverty:

1. They lack enough resources hence they end up trading their good health for other desired goods, services or goals which are short term benefits.
2. They lack full information and they end deviating from good principles such as good diet.
3. They suffer behavioural procrastination, self-control and are biased towards present consumption than provision for future consumption.

The theory puts forward that even the rich people face the predicaments of market failure largely from information asymmetry but that they are covered through insurance and pension policies. The Neoclassical theorists of incentives, market failure and access to credit markets propose radical thinking in institutional reform and direct assistance to poor families in the form of small transfers, policies that enable behaviour change and subventions (Davies & Martinez, 2014:27).

According to Rosenzweig (2012) the theory is biased towards small programmes for the poor but in reality, the costs of implementing micro level policies are higher than full-fledged programmes as a result of implementation costs, information asymmetry which is higher compared to larger and full-fledged programmes. Furthermore, according to Davies and

Martinez (2014), the theory does not address mismatch in labour market. This is so because types of skills are more important than quantity of education in avoiding poverty. In Zimbabwe, the government through the MPSLSW, give stipend disbursements to the poor and vulnerable at rural set ups. In 2016 a total of 500 000 households were targeted for social protection by the Government through social welfare disbursements “in order to reduce poverty, vulnerability and inequality and enhance access to basic social services” (MPSLSW, 2016). In 2019 the government disbursed ZWL\$49,083,722 equivalent to USD4,9million at Old Mutual Implied Rate (OMIR) to 202,077 households across country to cushion vulnerable members of the society from COVID-19, for monthly stipend allowances of ZWL\$300 (USD\$30) which is ZWL\$2,4 billion which is equal to USD 24million using OMIR was set aside for cash transfers to vulnerable families (MFED, 2019:25).

The poverty alleviation targets five pillars which are welfare, health, education, food and nutrition. The progress of social welfare has not significantly reduced poverty since 1980 due to inadequate resources and increase in poverty attributed to persistent droughts and macroeconomic disequilibrium. the collapse in these sectors resulted in bankruptcy of productive sectors, which resulted in social welfare support gaps (discontinuous) and exclusion of majority poor in urban centres (Dhemba, 2013:1).

2.3.2.4 Human Capital Theory (HCT)

The HCT theory was expounded by Becker (1964), and this falls under the broader Neoclassical theory. The theory claims that better wages and variations in earnings and income are a function of intelligence, education and environment at the personal level. Low skills perpetuate poverty as it leads to low pay thereby perpetuating poverty. The theory argues that most families are less keen to invest more in education hence they fall into the poverty trap. The assumptions of perfect competition and market clearing to do not always exist, however.

The policy proposed for Human Capital Theory includes increase in education expenditure for the poor and low income earning so as to raise their level of income potential. This includes adult education enrolment by the state. Human capital development has potential to break the poverty vicious cycle and inter-generational poverty. Mincer (1974a: 71) concludes that “education can affect earnings rates or earnings per unit period of time worked; it can affect labour force participation, especially at different stages of the life cycle; and it can affect the amounts of time worked as reflected by the frequency and duration of unemployment and part-time employment.”

Furthermore, OECD (2007) affirmed human capital to mean the costs, direct and indirect benefits to the society of investing in education. It noted that education investment is beyond personal cost and benefits but it encompasses low crime, improved health care system and provision, increase in social cohesion and a capacitated society.

Cognisant to the importance of human capital in reducing poverty, UNDP SDG 4 encourages countries to increase budget expenditure towards education (SDG4.4). Government of Zimbabwe has increased budget allocation towards education to 4.6% of GDP in line with SDG goal 4 (Word Bank, 2018). The importance of education in enhancing human capital which in turn reduces poverty cannot be overemphasized. Awan *et al.* (2011:659) summed the importance of education to human capital as follows:

Education and poverty are inversely related. The higher the level of education of the population, [the] lesser will be the number of poor persons because education imparts knowledge and skills which is supportive in higher wages. The direct effect of education on poverty reduction is through increasing the earnings/income or wages. The indirect effect of education on poverty is important with respect to 'human poverty' because as education improves the income, the fulfilment of basic necessities becomes easier and raises the living standard which surely means the fall in human poverty.

Generally, public expenditure in Zimbabwe on education is estimated at around 4.6% of GDP. Kanyongo (2005:69) states "The government policies achieved successes in increasing enrolment, achieving racial as well as gender equity in education, increasing the supply of educated manpower, and improving the country's literacy rate." However, poverty has remained abnormally high in Zimbabwe (World Bank, 2018) hence further investments into human capital are essential if the economy is to achieve SDG benchmarks by 2030 and the national Vision 30 espoused by National Development Strategy 1 which aims to make Zimbabwe a middle-income class country by 2030.

2.3.2.5 Ethnic minorities and immigration

Ethnic and racial classes are social constructions perpetuated in societies rather than natural orientations (Waters & Eschbach, 1995:421). Gereke *et al.* (2018:1) concluded that ethnicity causes poverty as it impacts negatively to social cohesion in the society's social and economic fabric. In most cases the ethnic minorities live in poverty due to discrimination, cultural influences and low education attainment (Davies & Martinez, 2014; Sarlo, 2019). The structural barriers minority migrants face makes them susceptible to poverty trap than natives due to the following difficulties:

1. Employment is difficult for minority migrants in general;
2. The period of stay in a host country determines poverty. Migrants who would have stayed longer have less poverty risk as they would access social welfare benefits than newcomers and would have adapted to the new social, economic, political and cultural environments existing in that country.
3. Access to education is an issue for the immigrants relative to locals.

Zimbabwe witnessed unprecedented increase in emigration and it is estimated that over 3 million citizens emigrated to South Africa, over 1 million to United Kingdom and 2 million are scattered all over the globe (America, Botswana and Australia among other nations) Crush *et al.* (2017). Only 27% of the emigrants work in formal sector, while 67% are labouring in casual trades in the informal sector and in the case of South Africa, 32% of emigrants earn between R2 000-R5 000 a month and only 14% earn R10 000 and above (Crush & Tawodzera, 2017). Furthermore, Zimbabweans in South Africa have faced xenophobia on numerous occasions (Crush *et al.* (2017). Xenophobia forms part of poverty in itself and it leads to deprivation and injury or death. The conditions discussed above drive many Zimbabweans abroad and their dependents back home into abject poverty.

2.3.2.6 Health and demographics

Age is a key aspect in determining personal stock of human capital. It determines directly determine incidence of individual poverty. Sick people are more prone to poverty as they are limited in their capacity to supply labour. They receive little rewards commensurate with their health-restricted labour. This aspect has a causality effect with income and directly affects productivity. Poor health in the form of obesity, alcoholism, smoking and drug abuse result in permanent poverty trap (Davies & Martinez, 2014). Moreover, people in unemployable ages (minors and pensioners) are more exposed to poverty than the working class. Therefore, age is an important determiner of poverty entry or exit. Finally, families with only one individual fending for them are more vulnerable to poverty than a family with more than one member working. This is so because family needs would easily depreciate the savings potential of a lone member taking care of the entire family needs. Single parent families (especially female headed) are more predisposed to poverty trap than families with both parents (Davies & Martinez, 2014).

Zimbabwe have recorded an increase in substance abuse mostly by the young people (Jakaza & Nyoni, 2018) and over 60% of street children abuse drugs (Embleton *et al.* 2013). This has a

strong bearing on labour supply as drug abuse leads to poor health as noted by Galvão *et al.* (2018):

Drug addicts are often incapable of maintaining a regular job or source of income, leading to various forms of so-called 'deviant' behaviour, such as robbery and swindle, so they can obtain their daily dose. Continued consumption of drugs and/or alcohol and the associated disregard for other essential needs also entails the progressive deterioration of the addicts' health.

Most common diseases from substance abuse include mental and brain damage, cardiac arrhythmia, renal failure, teratogenic effects, nervous system dysfunction, early and sudden death (Dell, 2006).

Correspondingly, the old people in Zimbabwe are more vulnerable to poverty because its largest employment sector, the informal sector, does not provide pension or insurance and government is unable to give social assistance to the vulnerable. "The current economic challenges the country is facing are seriously undermining the provision of social support and care as evidenced by declining budgetary support for social welfare services", (MPSLSW, 2016:13) hence old age poverty is rampant. Child poverty is also high in Zimbabwe, reported at 4.8million of 6.3 million children (UNICEF, 2020). This and this could be a result of a collapse in social services and persistently high unemployment in the adult population.

Generally, the neoclassical theory has been practical in explaining poverty in developing economies which have witnessed historical injustices which caused structural inequality in societies. Bracking (2004:1) defends the applicability of neoclassical theory of poverty when she stressed that:

In situations characterised by historical injustice in the distribution of economic resources, such as in many southern African 'settler' countries, there is a powerful intuitive case that ameliorative and palliative public policy is insufficient to significantly affect poverty reduction... because of the dulling effects on growth caused by significant structural inequality in the distribution of resources.

However, Bracking (2004: 1) points out that Keynesians methodology is most practical in ending poverty, emphasising that "state-sponsored redistribution policy has an important role to play in changing underlying property regimes for the benefit of the poor in southern Africa. Inequality does matter, and a consideration of radical, redistributive social change is worth rehabilitating as an efficient means of reducing poverty, particularly in situations of low or fluctuating growth."

Hague and Harrop (2010:150) queried the use of neoclassical theories in poverty reduction. They propose the use of developmental institutions and open economy as poverty reduction measures than relying on neoclassical principles. Their assertions support globalisation and trade organisation and developmental institutions such as Bretton Woods institutions (IMF & World Bank) in fighting poverty in every society. However, Nouri advises that there is no single theory that can be prescribed to end poverty but neoclassical assertions remain valid and useful. He submits that “my understanding is that there are no downright prescriptions when it comes to development economics and the liberal development theory is one among several other theories” (Nouri, 2013:2).

In general, the neoclassical theories have been found to be ineffective in explaining or ending poverty in Africa and Zimbabwe without considering corruption. Rampant corruption in both public and private sectors directly reduces economic development and the structural transformation of the economy (Lawal, 2007:1; Korankeye, 2014:151). Corruption increases poverty as resources are diverted by those entrusted to manage them. This happens when structural systems of the country are weak and selective. Weak economies “lack transparency, accountability and consistency, as well as institutional weaknesses in the legislative and judicial systems. These lacks are fertile ground for growth of rent seeking activities in such a country” (Myint, 2000:1). The diversion of already limited resources increases poverty than reduce it as it permeates deeper in society (Lawal, 2007:1). Zimbabwe has a corruption score index of 24 and corruption in the country is ranked 166 of 175 countries using Corruption Perception Index Transparency Index (TI, 2020). Zimbabwe’s corruption ranking of 24 implies that it is rife in the country, and this has a direct effect on poverty.

2.3.3 Classical Theory

The classical theory was expounded by Adam Smith, a Scottish economist in his *Wealth of Nations* (Adam Smith, 1776). This classical theory was later developed in the 19th century by David Ricardo. Adam Smith “hypothesised that it was the combination of private capital and property, the free operation – or the ‘invisible hand’ – of the market and human labour that was the source of economic growth” (Engel, 2010:2). When the theory emerged, poverty was common but not very problematic. The theory has roots in the agricultural perspective where workers receive wages reflecting worker productivity for the labour supplied. The landlord obtained market-related rent while the farmer accumulated efficient profits for the business. Poverty is caused by the poor individual’s wrong choices such as lack of self-control that diminishes productivity and differences in genetic and dexterity in people (Davis & Martinez,

2014:17). The wrong choices taken by people result in poverty or their choices perpetuate the poverty trap which then degenerate, further pushing people deeper into the poverty cycle. Government intervention to alleviate poverty is seen as inefficient and unnecessary and would result in a welfare state which reinforces poverty than reduce it. However, minimum state intervention is needed for basic welfare to avoid people being trapped in destitution. The theory prescribes efforts to raise productivity in people despite them being sick, young, old or disabled.

The theory postulates that economic development is the cornerstone for fighting poverty. Economic development is defined as “as a process embedded in, and limited by a particular physical, institutional, and social environment... and is shaped internally and bounded externally by laws and institutions” (Arrighi, 2007). Trade aids development through comparative advantage in an economy against its trading partners and specialisation. Economies should advance “capital accumulation, production, and technological advancement, division of labour and population growth to reduce poverty” (Engel, 2010:3).

The Classical theory stresses that difference in professions, social environments as strong elements leading some people to poverty (Baum, 1992:144). These assertions require further analysis as some people in the same profession have different levels of poverty. Poverty level depends on personal attributes of people and consumption patterns, preferences and household sizes. Furthermore, Smith’s Classical theory focuses on extreme income poverty (Baum, 1992) and this makes the theory less appealing to the poverty reality faced by different people in society.

The Classical theory has been challenged as Adam Smith was interested in reducing government expenditure towards wars. When Classical theory was formulated, poverty was not as severe to cause malnutrition, diseases or death. Poverty was not lack of health or basic needs but had to do with isolation and feeling inferior (Gilbert, 1997). Adam Smith’s understanding of poverty showed society not lacking. His Theory of Moral Sentiments speculated: “What can be added, to the happiness of the man who is in health, who is out of debt, and has a clear conscience? To one in this situation, all accessions of fortune may properly be said to be superfluous” (Adam Smith, 1759:45). On the other hand, David Ricardo differed with Adam Smith, proposing a Ricardian equivalence strongly stating that government taxes do not have effect on household consumption.

The theory advocates for 'natural gravitation prices' for long run equilibrium which is not always possible. Kaldor in 1934 criticised the Classical theory on the fact that attaining long run equilibrium is not a function of prices alone:

It is not possible to determine the position of equilibrium from a given system of data since every successive step taken in order to reach equilibrium will alter the conditions of equilibrium (the set of prices capable of bringing it about) and thus change the final (Kaldor, 1989:16).

In 1972, Kaldor disagreed with the Classical theory's reliance on equilibrium settings which he termed (birth of equilibrium economics) as a solution to poverty. He contended "the habits of thought engendered by 'equilibrium economics' have become a major obstacle to the development of economics as a science" (Kaldor, 1972:1237).

Robinson (1962) proposed that the Classical theory long run assertions should be 'abandoned' as they are not applicable. His argument was that the theory falsifies expectations using equations based on the past or current fundamentals to drive equilibrium path. Robinson said "a model applicable to actual history has to be capable of getting out of equilibrium; indeed, it must normally not be in it" (Robinson, 1962:24). In his further studies, Robinson (1972a) concluded that the Classical theory does not consider political aspects of society which cannot be reduced to equations but exert a strong bearing on the equilibrium determination.

Both Adam Smith's and Ricardo's theories do not effectively apply in the current situation in Zimbabwe. UNDP is advocating governments to increase GDP spending towards social services and health as a way of reducing poverty. Hence, classical theory is limited in the context of Zimbabwe where poverty literally makes people sick, lack food and leads to death (UNDP, 2020). Classical theory is informative but its applicability requires integration with other theories in order to formulate a multidimensional approach to poverty analysis and measurement.

2.3.4 Keynesian Theory/ Liberal theory

The Keynesian theory asserts that economic growth results in economic development, via the multiplier effect. It is a theory that sees government interventions as essential in fine-tuning the economy fundamentals. According to Keynesian theory, government enters the market to deal with "the outstanding faults of the economic society in which we live are its failure to provide for full employment and its arbitrary and inequitable distribution of wealth and income" (Keynes, 1973:372). Distribution of resources and income "involves nothing more than the set of

conventional macroeconomic policies – fiscal and monetary and, in an open context, exchange rate policies” (Arestis *et al.* 2018). Government enters the market for the following aspects shown in Figure 2-4



Figure 2-4: Government interventions functions under Keynesian theory

Source: Researcher’s own presentation

2.3.4.1 Provision of public goods and capital goods

Given the high cost of capital outlay of capital goods and the characteristics of public goods, non-rivalry, non-diminishability and non-excludability of public goods, private citizens are willing to offer such goods and services. The poor can thus enjoy the flow of such goods in an economy if these are provided by the government. The failure to provide such goods by government would result in higher poverty thresholds. Aspects such as corruption that are inherent in the chain of provision of public and capital goods cause a mismatch between cost of their production and quality. The cost arising from corruption is borne by the citizens in general, making the people worse off. This increases their vulnerability to poverty trap.

2.3.4.2 The macro perspective

The government enters the marketplace to promote human capital by way of aggregate investment. It is essential that government promote public education and tackle involuntary unemployment as both have the net effect of enhancing economic growth and via multiplier effect, government participation in the provision of public goods reduces poverty. The point is that low to nil government participation increases poverty as there is a causal relationship between public investment in public goods and private investment. The state fiscal revenue derived from taxation or Treasury Bills issue is channelled towards public goods or the socialisation of investment and this has an effect on poverty in the economy (Jung & Smith, 2007). In most cases poverty thrives in economies where there is little socialisation of investment. It can be deduced that injections into the economy reduce poverty while withdrawals increase poverty. Injections promote aggregate employment, private investment, increase in taxation income which effectively leads to economic growth either through employment or resources availed towards anti-poverty programmes by the state. An increase in revenue by government enables its participation in social cohesion through deliberate anti-poverty projects.

2.3.4.3 Unemployment and poverty

Unemployment is a direct cause of poverty as lack of income means consumption is erratic and discontinuous. Employment remains a major guarantor against poverty: unemployment increases vulnerability to poverty as it takes away the probability of acquiring assets. People who are unemployed face both transitory and permanent poverty, which make them enter poverty cycles numerous times. According to Reinstadler and Ray (2010), unemployment has a direct and indirect bearing on poverty. Directly, higher aggregate unemployment in the economy propels the probability of individual unemployment. Indirectly, higher unemployment diminishes the wage bargaining power of employees hence their earnings fall below the equilibrium. In light of this, it remains imperative to study poverty from a global perspective as it affects local employment more than anticipated (Davies & Martinez, 2014).

2.3.4.4 Other macroeconomic factors that cause poverty

Poverty is also caused by high inflation, high sovereign debt and asset bubbles. Hyper inflation erodes earning power (inflation tax) of the workforce hence the basket of goods shrinks as people shift consumption towards necessities for life and soon, they cannot afford anything. As inflation increases, poverty takes the same trajectory. On the other hand, high sovereign debt

increases poverty by reducing economic growth. The debt reduces the resources that are at the disposal of government towards economic growth and national economy shifts towards debt repayment. Austerity measures become a priority for the government and this reduces economic growth and poverty deepens further. Finally, asset market bubbles, for example, sudden jump in housing prices and rentals, leads to increase in homelessness (Early & Oslen, 2002). The housing bubbles cause poverty as the cost of rent and buying houses increases and the vulnerable groups in the economy are driven into poverty. Asset bubbles can be caused by financial crises which cause deflation and the chain leads to unemployment, a direct cause of poverty.

Poverty in Zimbabwe can be related to Keynesian theory. Government interventions are currently contractionary. Employment opportunities remain squeezed and where expansionary fiscal policies are pursued, government spending priorities have been challenged because they generate deadweight debt (Vutete, 2016). Moreover, interest rates in Zimbabwe have been around 35% (RBZ, 2018) per annum compared to South Africa interest rates of 3.75%-6.25% according to South African Reserve Bank (SARB, 2020). High interest rates reduce the appetite to borrow, given the fact that investors want to maximize their returns. In this regard, investment is negatively affected and this in turn reduces economic growth. Consequently, poverty increases. However, government cannot be relied upon to resolve poverty because it is run by politicians who are egocentric and have little regard to serving people. "Politicians take action mostly in self-interested projects thus making the government part of the problem" (Nouri, 2013:8).

Keynes defined poverty to mean the "struggle for subsistence" (Keynes, 1972: 326) and he also emphasised "impoverishment of families and individuals" (Pressman, 1991:365). These definitions of poverty have evolved to imply life beyond subsistence and income hence Keynesian theory excludes multidimensionality aspects of poverty. Keynesians subscribe to the notion of a redistributive approach of welfare through income distribution, government transfers and skills transfer to enhance human capital (Pressman, 1991:365). These assertions exclude non-monetary aspects such as those raised by Sen's capabilities approach. Keynesian theories are therefore partial to economic aspects of poverty. Poverty also includes environmental, social and political variables that should be considered. Some scholars have remained unconvinced that economic development alone can lessen poverty. Pressman (1991) highlighted that the Keynesian theory has numerous applicability challenges. He postulated that:

Despite the great emphasis on economic growth as an antipoverty tool, a number of economists have remained sceptical that economic growth can eliminate poverty...

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growth increases average incomes, those at the bottom of the income distribution will not necessarily benefit when incomes rise on average... Economic growth also cannot help the elderly or the disabled escape poverty, since these individuals cannot be expected to work even if jobs are available (Pressman, 1991:367).

Danziger and Weinberg (1986) concur with Pressman and challenged the Keynesian theory of poverty by arguing that it fails to address issues such as child care and social security for the vulnerable. In this vein, despite an economic growth, some people are bound to remain in poverty. Therefore, it is logical to look at other theories to explain poverty. It is also fact that redistribution of income advocated by the Keynesians could increase inequality in society hence economic growth could actually lead to more poverty (Ellwood, 1998). Furthermore, Crotty (1990) concludes that the Keynesian theory best works in an economy experiencing the British type of economy of the 1930s-1940s which was emerging from World War II.

It has also been argued that Keynesian theory applicability to poverty modelling is a fallacy hence, Lucas strongly advised the death of Keynesian Economics (Lucas, 1980) when he posited that:

One cannot find good, under-forty economists who identify themselves or their work as 'Keynesian.' Indeed, people even take offence if referred to as 'Keynesians.' At research seminars, people don't take Keynesian theorising seriously anymore; the audience starts to whisper and giggle to one another.

Lucas' assertions above were later supported by Mankiw (1992:1) who summed that "it seemed the Keynesian theory were leaving macroeconomics to enter the history of thought." Furthermore, Keynesian proposals such as Bretton Woods Conference in 1944 have been ignored because policy makers do not agree on aspects such as free lunch aid for trade which the Keynesians proposed for developing economies (Pressman, 1991).

2.3.5 Marxist/ Radical Theory

The proponents of radical theory contend that capitalism, together with political and social factors, are the main cause of poverty as the market is fundamentally dysfunctional (Blank, 2010). By their profit drive motive, capitalists keep labour below the market equilibrium. The existence of unemployment in a capitalist society is deliberate for the capitalists to get cheap labour from the labour market. The policy redress in a capitalist arrangement requires setting of minimum wages, regulation of working conditions and promotion of higher wages. Poverty is transmitted through the following:

2.3.5.1 Minimum wages

This is a result of capitalists' abuse of workers by creating an environment in which the capitalists have stronger control on prevailing wage rate. This increases scope of poverty among workers as manipulation of labour market makes them worse off in terms of wages and working conditions. Indirectly, low wages make the workers develop poor health and this directly reduces their human capital. From low wages received, the workers cannot make savings. They are pushed deeper into poverty trap with little probability of ever emerging from poverty in the event of an economic shock such as a recession, financial crisis or unemployment (Gordon *et.al.*1982:1)

2.3.5.2 Dual labour markets

The theory was first advanced by Doeringer and Piore (1971). Labour market is demarcated into primary and secondary sectors which have distinct characteristics on production and labour. Marxists place greater emphasis on the secondary sector (Townsend, 1979), because it offers unstable employment, undifferentiated labour force performing homogeneous roles, no job training required and offered. Workers have poor wages and often low chances of promotions. The workers in the secondary sector are prone to poverty compared to those hired in the primary labour market. Poverty can be reduced in the sector if trade unions are created that then set minimum standards in the secondary workplaces. Trade unions can also bargain for mandatory on the job training which is vital for secondary labour force to integrate into primary labour market. In Zimbabwe, the secondary labour market is the informal sector which is unregulated. Despite the government pronouncing higher employment in the informal sector, there are low salaries, no employment security and no prospects for pension, hence people in this sector are prone to poverty.

2.3.5.3 Discrimination and class

Poverty is caused by unequal access to scarce resources in an economy. The main causes of inequality are demographic and social and economic factors as shown below in Figure 2-5.

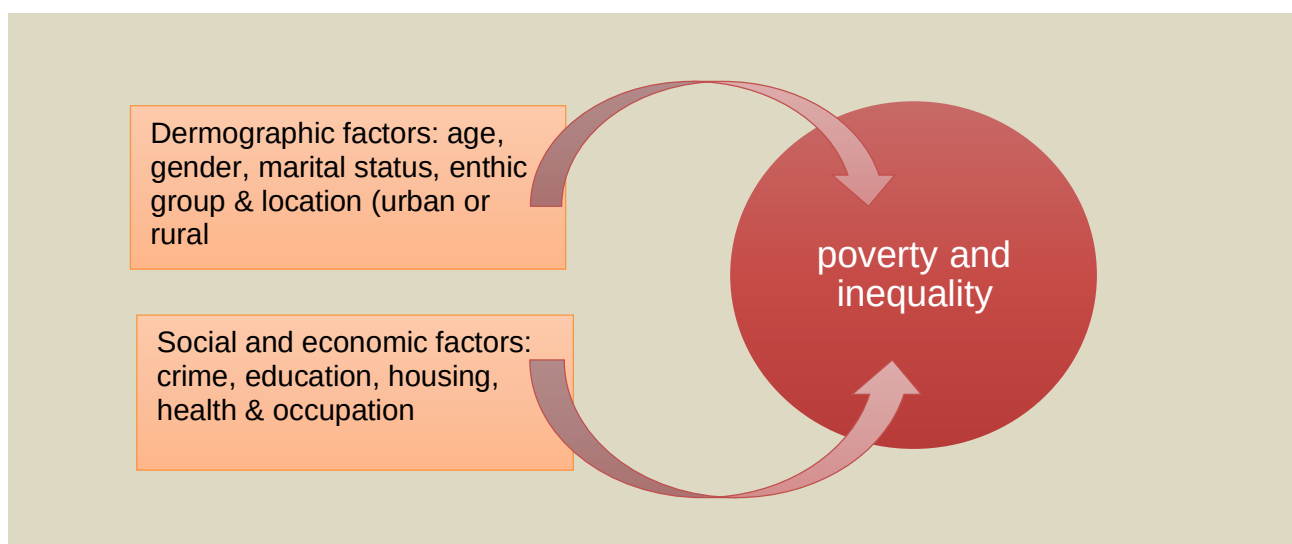


Figure 2-5: Discrimination and class factors that cause poverty: Marxist view

Source: Researcher's own presentation

The discrimination in labour causes poverty as it hinders full participation of the affected individuals in spheres of the economy; economically, politically and socially. Race remains the strongest weapon that affects emancipation of every citizen in the society (Elliot & Sims, 2001). There should be antidiscrimination policies and laws to fight poverty. However, the critics of this theory agree that it relies on judgment as some factors cannot be measured (Townsend, 1979).

2.3.5.4 Environment as a cause of poverty

Poverty is a consequence of unsustainable exploitation of resources and harmful emissions during production, consumption or disposal of bi-products (Davies & Martinez, 2014). Over time, the damage outweighs the benefits derived. For instance, negative externalities lead to pollution which directly affects the health stock of human capital, this ultimately increases the probability of the affected people to fall into poverty. The most dangerous is air pollution which causes cancer and respiratory diseases that consequently affect the productivity and stock of human capital.

Policy should be geared at reducing negative externalities by advancing production lines in order to reduce pollution. It is recommended to offer social services and grants to the affected so that they can improve their stock of health. Pollution taxes and permits (cap and trade rights) have been advocated for reducing pollution.

Marxist theory asserts that poverty is directly related to lack of opportunities due to structural aspects that cause various forms of nepotism and discrimination (gender, age, race or ethnicity

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(Datt, 2004). The theory further advocates for retraining to enhance human capital development. The theory cannot be applied effectively in the case of Zimbabwe as it is mainly focused on retraining than creating far reaching opportunities. Marxist theory, like the Keynesian, concentrates on the structural aspects of the economy whereas poverty can still arise in economies offering full employment (Fox et.al. 2005). Marxist theories have been criticised for being 'economically deterministic'; they believe the economic structure is the main aspect that causes poverty and this has been termed 'vulgar' of the Marxism (Newtown, 1988).

2.3.6 Social exclusion theories

The social exclusion and minority group theory, social capital and eclectic theory are considered peripheral theories in explaining causes of poverty. The social exclusion entails excluding some individuals of the society from participating in the economy. Exclusion is not confined to income alone but extends to participation of the poor in opportunities available in the society, health and neighbourhood inequalities that exist in the economy. Social capital is a complementary theory first proposed by Loury, (1977) and is an extension of human capital theory which is a network built around norms and trust. The theory projects that some people have better social connections to the job market opportunities than others, causing differences in economic outcomes between minority and majority groups. According to Rowntree, (1901) the minority are pushed into poverty due to insufficiency in accessing the minimum necessities which arise from the following:

1. Death of household head or bread winner of the family
2. Incapacitation of breadwinner through life events that affects productivity
3. Chronic job irregularity that affects income
4. Large family size
5. Low wages and income

In general, the old, children, young couples and minority races face the highest risk of falling into poverty as a consequence of social exclusion. Their potential for earnings is affected by their age, race or cultural difficulties.

Aguayo *et al.* (2016) performed a social exclusion poverty measurement between Spain and Portugal using poverty rate, acute resource poverty and work intensity of households. The study

concluded that there was an increase in acute poverty for people below 16 years of age in both countries.

In the case of Zimbabwe, Kaseke (2003) defines social exclusion as “a situation where some people benefit from a policy or programme whilst others, due to circumstances beyond their control, do not.” The study was based on social exclusion of social security in Zimbabwe and concluded that most people were excluded from the social security. The study identified women as the most excluded. In conclusion the research noted that social exclusion exerts a severe impact on the stock of total human welfare and causes society members to feel depressed and demoralised when marginalised. Further studies by Munsaka (2014) used the social exclusion theory in Binga community, Zimbabwe. The target respondents were people living with disability. Munsaka (2014:1) concluded that Binga women living with disabilities like their counterparts had a huge interest in participation in the development programmes and initiatives in their communities. It was noted that despite their zeal and interest to participate in the economy, both males and females with disabilities face insurmountable challenges to access the formal economy. However, there have been little developments in use of social theories of poverty in developing countries:

Regarding developing countries, there has been much less interest in whether generous social policies encourage moral hazards. Rather, scholars typically focus on how market inefficiencies and problematic policies disincentivise poor people from investing in productive activities (Brady, 2018:7).

Deetz (2000:20) supports the use of social inclusion policies to “create opportunities for a wider discourse among group members as well as between social groups and the society they operate in” as a clear road map to anti-poverty alleviation.

It is clear from the theories presented that there is no single theory that is more applicable than others in explaining poverty because poverty is not a static condition. The current theories on poverty explain absence or inadequateness of underlying fundamental principles of both microeconomic (individual level analysis) and macroeconomic (economy-wide analysis). The “...dominance [of a certain approach to economics] means a common language and common methods. It certainly does not imply a common ideology. In fact, economics today is characterised by its pragmatism. For most of us, markets often work well but sometimes they work badly” (Backhouse, 2010:146). These observations by Backhouse are supported by Nouri (2013:2) who says that no single theory can be prescribed to end poverty. Instead, all theories remain valid and useful. They should be combined to explain the extent and effect of poverty.

2.3.7 Circumstantial/ situational poverty

Situational poverty is explained by personal attributes and behaviours in relation to circumstances that people find themselves in that cause poverty. According to Ross & Nisbett, (2011), situationism is derived from psychology and it identifies the social origin of specific behaviours that cause poverty, for instance an individual's decision to quit employment or drop from school or training facility before accomplishment. Situational poverty theory includes both the macro factors and individual behaviours to explain the circumstantial roots of individual behaviours (Calnitsky, 2018:7). Situational poverty is mainly explained by behaviour in relation to circumstances (Doris, 2002:2), or sometimes called the “the inconstancy of our actions” (de Montaigne, 1991). There are two distinct schools of thought for circumstantial poverty. The first one is the rational adaptation theory which states that that poor people's behaviours and actions are perfectly inclined to rational adaptations to the circumstances. The second school of thought is the irrational behaviour psychology which states that poverty makes the poor people to act irrationally and this reinforces poverty (Calnitsky, 2018:7). Figure 2 6 below shows the schools of thought for situational/ circumstantial poverty.

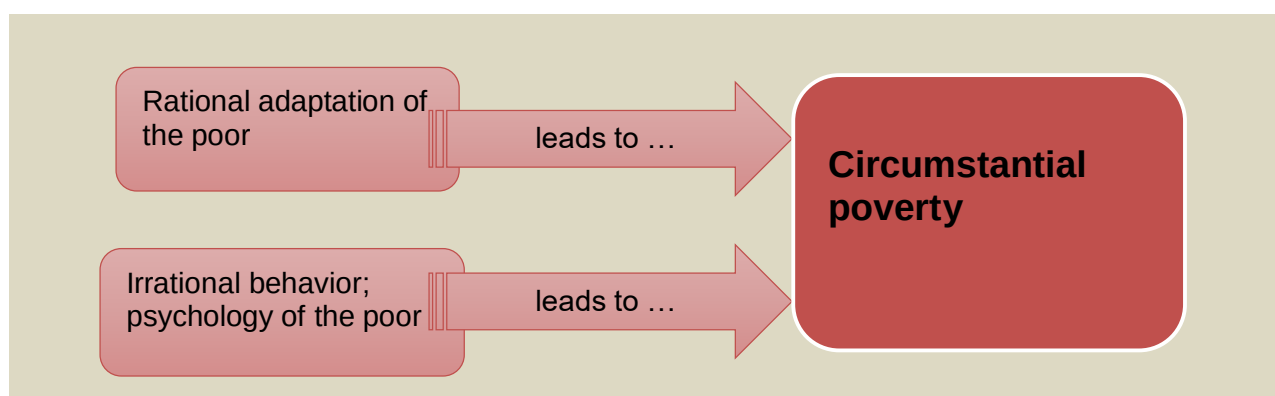


Figure 2-6: Schools of thought for situational/ circumstantial poverty

Source: Calnitsky, 2018:7

Banerjee and Mullainathan (2010) are proponents of the situational poverty. These researchers maintain that the circumstantial attributes the poor people are subjected to, for instance, resource scarcity causes them to over borrow, not to make sufficient savings or their failure to undertake government assisted programmes, increase the probability of them behaving irrationally and this increases their poverty. Financial resource scarcity causes impairment of the poor's cognitive capacity and this results in mental breakdown as the poor fail to cope with the strain. In the instance of price increase for basic goods, the poor are forced to adjust their consumption patterns and this causes mental breakdown.

According to Spilerman & Elesh (1969) situational poverty is an 'adaptation of the poor people to the environment and circumstance. The poor have higher gratification for the present consumption and never invest in the future as they perceive the future precarious for rational decision making.' For example, people who do street mugging for a living because there are no socially acceptable jobs within the pale of vocations. Circumstantial or situational poverty is a result of low incomes which create consequential causal behaviour; there is a behavioural chain created from manipulation of the prior primary factor (Spilerman & Elesh, 1969:360). Circumstantial theory of poverty identifies the phenomenon to be as a result of geographical locations, inadequate natural endowments, unemployment, old age, physically affected areas and mental disabilities as explanatory variables for poverty in some parts of the world (Sheriffdom 1997:31).

The Circumstantial Theory assumes that the notion of poor has a myopic approach to life and they borrow continually at exorbitant interest rates to satisfy their short-term consumption needs. This creates circumstantial poverty to perpetuate further (Benergee & Mullainatha, 2010) and can be explained using Euler inequality;

The Euler inequality model states the following:

$$u'(c_t) \geq \delta R'(c_{t+1}) \dots \dots \dots (1)$$

where;

R is the interest rate on borrowing

(c_t) Represents household consumption in the current period

c_{t+1} Represents consumption in period 1

The theory states that for the poor the current consumption is higher than future consumption, showing that the poor rarely think of life in the next period.

2.4 POVERTY MEASUREMENT

The next objective of the study that is addressed in this section is on reviews and critiques of existing measures of poverty and their applicability in the context of Zimbabwe. Different poverty definitions 'span different spheres of concern and this makes poverty not an easy aspect to measure.' Definitional differences leave questions lingering as to what to include in a poverty measure, should the measure be linked to political, cultural, social or material aspects?

(Laderchi *et al.* 2003). Nurliyana *et al.* (2017) state “poverty needs to be measured more precisely to provide a meaningful understanding of how much progress has already been made, how much more remains to be achieved, and how to set incentives for government officials to focus on the most pressing needs.” Zheng (1997:1) highlighted that poverty measurement is a noble idea but also the way poverty is measured has an impact on poverty reporting and anti-poverty evaluation. Sen’s axioms have long been used to determine desirability of a measure and these are fully explained under Sen’s Index.

It has also been noted that poverty measurement “framework for poverty analysis must seek to reflect societal changes and economic shocks such as the current COVID-19 pandemic crisis, in distinctly human terms. For this, we need the right concepts and measures” (Hick, 2012:1). Sen asked objective questions from society’s standards perspective which should be used to guide the development of an objective and acceptable poverty measure. Sen emphasised that poverty measurement should always be based on certain societal standards. These standards reflect the policy objective emanating from ongoing discourse (Sen 1979:286).

However, some poverty measures and their indices are rarely used because they are complicated to be understood for policy formulation or by the general public (Xu & Osberg, 2012). Some poverty estimates do not fully portray the actual poverty occurring as they are primarily income based in their approach to poverty analysis and measurement (Mitlin, 2012).

Poverty measurement involves two key aspects (Sen, 1976: 219). These are:

1. Identification of the poor;
2. Aggregating the features of the poor into a poverty measure.

World Bank (2001:16) produced five important reasons for poverty measurement:

1. It enables hypothesis formulation and testing on the causes of poverty and the probable impact of policy interventions to the society, households or individuals;
2. It gives aggregate poverty view and understanding over time;
3. It enhances governments to set measurable targets for adjudicating their poverty interventions actions;
4. It facilitates inferences on circumstances and evolution of poverty at the national, society, or international level

5. It permits investigation into the connections among different dimensions of poverty.

UNDP and OPHI (2019) summed the importance of a local MPI differently as follows:

1. To determine the official level of multidimensional poverty in a society or country;
2. For poverty comparisons by regions and groups;
3. To trail poverty over time and determine if it is decreasing or increasing in line with set standards;
4. To indicate how people are poor, using specific MPI indicators.

Also, according to Haan (1997), poverty measurement enables analysis of sectoral poverty growth trends and the determination of the effects of poverty policies interventions. Xu and Osberg (2002:2), state that poverty measurement helps to determine the level of poverty, thus “how much poverty is there” and if “poverty is increasing or decreasing.” Most studies currently concur that urban poverty is underestimated because there is an inherent undercounting of the urban populations. This is attributed to instruments and methodologies for data collection that have been stagnant for over 40 years and have become obsolete the task at hand (Mitlin & Satterthwaite, 2013).

Underestimation of poverty results in low prioritisation of urban poverty in development agendas (Haan, 1997). It has also been noted that “poverty, while an intuitive concept, proves harder to specify and measure, especially over time”, (Metzler (2014:1); Laderchi *et al.* (2003:244). Poverty measurements differ from country to country as some use relative deprivation (developed countries) whilst other countries use absolute poverty lines (developing countries) (Dotter & Klasen, 2014:3). All this ultimately affects the poverty measurement statistics because the poverty statistics differ from one method to another.

2.4.1 Approaches to Poverty Measurements

Poverty measurement methods have remained the work of researchers and to this end, some researchers such as Sen deliberately did not provide a clear poverty measurement framework; hence various poverty measurement methods have been expounded. Walker (2015) identified 4 broad approaches for measuring poverty and these are discussed below:

2.4.1.1 Pragmatic Approach

The approach proposes that dimensions for poverty measurement should be constructed from the following foundations:

1. Easy availability of variables to formulate dimensions
2. Suitability of practical dimensions to impact anti-poverty policies framework
3. What data set(s) is practically available for poverty measurement?

The model by Walker adopted UNDP Human Poverty Index and later the MPI adopted the pragmatic approach. The weakness of this model is that studies such as Hull & Guedes, (2013) tried to use the Walker Pragmatic approach but found that data for poverty measurement is not always readily available. Hull and Guedes (2013) conducted research for Thailand and reported that some of the data required was not readily available or unquantifiable. However, other studies (Alkire & Santos, 2010; Alkire & Foster, 2010) used this approach for poverty measurement in Sub Saharan Africa. The biggest weakness of the pragmatic approach remains that it imposes value judgment of the researchers on a society that is not informed by any underlying economic principle.

2.4.1.2 Theoretical Approach

Theoretical Approach uses theoretical definitions for poverty measurements which include various poverty measurements; there is large evidence that the model is being applied in South Africa (Noble *et al.* 2006: 40) in which poverty measurements are constructed on various dimensions of political, social and economic factors. The model had some success in measuring poverty but the originators of the model highlighted challenges in moving from a theoretical framework to practical measurement (Noble *et al.* 2006).

2.4.1.3 Engaging the general public

The method encourages engaging the general public in order to understand what dimensions to include in poverty measurement. The model was used by Mtapuri (2008) in Zimbabwe, Mashonaland East province, when community views were sought in designing a poverty measurement. The study produced unique dimensions for measuring poverty specific to that community. The dimensions obtained from engaging the public were livestock, food, and marriage, farming equipment, daily provisions and shelter (Mtapuri, 2008). Likewise, Barnes and Wright (2012) used the concept of engaging the society in order to come up with the rightful

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dimensions to use for poverty measurement in South Africa and new dimensions were obtained. These included caregivers during illness, separate rooms for children and adults, street lighting and tarred streets (Barnes & Wright, 2012:8).

The list of dimensions to use for poverty measurement has resulted in various methodologies being adopted for multidimensional poverty measurements.

2.4.1.4 Asking the poor themselves

The method involves asking the poor themselves to give dimensions they think best explain their convictions in formulating poverty measurement. The World Bank has adopted this method in their “Voice of the poor” working papers (World Bank, 2018). World Bank asked sixty thousand people in sixty developing countries to define poverty (Narayan & Petesch, 2002). The World Bank research concluded that the majority of poor people regarded wellbeing to be more important than wealth. Wisor *et al.* (2016) also asked the poor people to construct International Deprivation Measure (IDM) using data from 18 developing countries. The study produced 15 dimensions to construct a feasible poverty measure, even though most of the dimensions were already known.

2.4.2 Unidimensional Poverty Measurement

Alkire (2009: 6) provides a clear working definition for unidimensional poverty:

The unidimensional method of identification takes into account dimensional deprivations, but only insofar as they affect the aggregate indicator. There is minimal scope for valuing deprivations in many dimensions independently of one another, something that is viewed as an essential characteristic of a multidimensional approach.

The four poverty measurement methods are:

1. Monetary approach;
2. Social exclusion (SE) approach;
3. Participatory Approach (PA);
4. Capability Approach (CA).

Except for the monetary approach, the rest have strong emphasis on multidimensional poverty measurement framework. However, literature indicates that poverty reported from country to

country varies with the poverty method applied and there is no evidence that different poverty measures have produced similar results.

2.4.2.1 Monetary approaches

Evidence of the first monetary poverty measure is biblical, when in the 5th century B.C Moses measured Abram's (father of all nations) gold, livestock and silver to describe his non-poverty state (Genesis 13:02) and the words poor and rich have been used 199 and 236 times respectively throughout the KJV bible to signify monetary possessions or lack thereof. The monetary approach was first developed by Booth in 1887 in London and Rowntree in 1903 in New York. The monetary approach is the most used measure of poverty and it identifies poverty as a condition of insufficiency of income or expenditure. Rowntree's (1902) poverty measurement method was the first scientific study that classified people into primary poverty or secondary poverty and determined that the phenomenon existed (Laderchi *et al.* 2003).

2.4.2.1.1 Head Count

head count is the "commonest measure" explicitly used in quantitative poverty measurements and was used by Booth (1889), Rowntree (1901), Townsend (1965) and Orshansky (1965-1966). It is still the mainstay of poverty statistics (Sen, 1979:294). The basic model from earlier poverty measurement can be shown as:

$$H = q/n \dots \dots \dots (1)$$

where:

q refers to the total number of the poor people

n stands for the total population size. It was later modified by Atkinson in 1987 to include a ranking aspect of the poor people as shown below

2.4.2.1.2 The Atkinson 1987 Head Count

Developed by Atkinson (1987), this method uses the size of people falling below an arbitrary but intelligible poverty line Z^* which varies between $[Z^-, Z^+]$. The method examines and ranks all the Z variables within the $[Z^-, Z^+]$ range. The head count then develops a cumulative distribution of Z^* for the function $F(Y)$ where Y is income or a measure of standard of living.

Formally:

$$P_0 = \frac{N_p}{N} \dots \dots \dots (1)$$

N_p is the number of poor people;

P_0 is the poor population of the community;

N represents community population. In order to show expenditure, income and Z values, the above equation (1) can be written as follows:

$$P_0 = \frac{1}{N} \sum_{i=1}^N I(y_i < Z) \dots \dots \dots (2)$$

Z represents the demarcated poverty line;

y_i stands for the expenditure;

N stands for the population size of the society.

The function $I(y_i < Z)$ takes the value of 1 if the $y_i < Z$ is true and individuals are counted as poor, otherwise it takes 0 value.

The head count method is easy to understand and construct for poverty incidence and is common with the Zimbabwe Statistics Agency (Zimstat) and World Bank poverty measurements. Both the 2012 and 2017 Zimstat poverty surveys used the head count to measure poverty. The main weakness of the head count method is that it does not tell us poverty intensity and poverty gap existing within the society (Siddiqui, 2006). Poverty intensity which is ignored by the head count is important in understanding inequality between households, for example arbitrary expenditures between two societies as shown below in Table 2-1.

Table 2-1: Arbitrary expenditures between two societies

Expenditures	Individual expenditures at poverty line of \$125				Head count (P_0)
Society 1	105	110	155	150	50%
Society 2	123	122	160	150	50%

Source: Researcher's own analogy

From the table above, both societies exhibit 50% poverty but society 1 is poorer than society 2 given that the total expenditures for Society 1 are less than that of Society 2, and this is ignored

by the head count analysis. Head count is therefore unsatisfactory and misleading in measuring poverty. The head count is also not multidimensional as it concentrates on income aspects and also in the process violates the tenets of the transfer principle which says measure of welfare is improved by transfer from richer to poorer (Dalton, 2019). The head count does not show the extent of poverty (*how poor are the poor*), what happens when the people whose welfare below poverty line deteriorates further or improves but remains still below poverty line? The head count also assumes households in the same society enjoy the same welfare and have the same poverty which is unreasonable in the real world as welfare varies according to gender, age, productivity, and structural changes in the economy. The Atiknosn theory do not provide durational analysis to poverty but it is a mere expenditure between different locations which is one of the imperical objectives of the study. The analysis however, can be used to design poverty trend analysis which is theoretical objective of the study.

2.4.2.1.3 Poverty gap index

This index measures by how much people or households fall below the invented poverty line and depicts it as a percentage of the poverty line. This is illustrated as follows:

$$G_i = (z - y_i) \cdot I(y_i < z) \dots\dots\dots (1)$$

where:

G_i is the poverty gap

z is the poverty line

y_i is the available income of the poor

The poverty gap index can be shown as:

$$P_i = \frac{1}{N} \sum_{i=1}^N \frac{G_i}{z} \dots\dots\dots (2)$$

P_i stands for the poverty gap index. The mathematical illustration of the poverty gap index is shown below

Table 2-2: Calculating poverty gap index

Arbitrary poverty line for the society pegged at \$200					P_i
	Households' consumption in Society A				
Society A consumption	170	150	165	210	
Poverty gap	30	50	40	0	
G_i/z	0.15	0.25	0.24	0	(0.64/4) =0.16

Source: Researcher's own illustration

Table 2-2 shows that the poverty gap index is 0.16; it indicates the poverty gap existing among the poor in Society A. Poverty gap index of 0.16 indicates a small gap and most incomes or expenditures are close to or above the poverty line hence poverty is not high. A larger poverty gap index reflects higher poverty. The advantage of the method is that it captures resource transfer effect on poverty and it shows how poor are the poor and also provides with the magnitude of inequality as information from all households is aggregated to calculate society's poverty gap index. However, poverty gap being a money metric measure does not consider other poverty variables such as human liberties, social variables and empowerment among other aspects. The above presentation enables poverty comparison between locations, which is one of the objectives of this study. However, it does not tell how long has the poverty been in the society and whether it is increasing or decreasing; these aspects not addressed by this theory are the imperical objectives of this study. The theory does not enable researchers and readers to determine the drivers of poverty being presented, this is one of the objective of the current study.

2.4.2.1.4 Poverty severity index

this index is the squared poverty gap, which determines poverty inequality that exists among people in given society. It is constructed from total weighted poverty individual poverty gaps. The poverty severity index measure indirectly puts more weight on individuals who are below the poverty line. Table 2-3 shows how poverty severity is calculated using expenditure and poverty gap.

Formally:

$$P_2 = \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{z} \right)^2$$

Table 2-3: Calculating poverty severity index

Assuming an arbitrary poverty line of \$200					(P _i) ²
	Individuals' expenditure in country A				
Country A expenditure	170	150	165	210	
Poverty gap	30	50	40	0	
G_i/z	0.15	0.25	0.24	0	0.16
$(G_i/z)^2$					0.0256

Source: Researcher's own illustration

The poverty severity index equation (2) can also be written according to Foster, Greer and Thorbecke (1984), as:

$$P_\alpha = \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{z}\right)^\alpha, \alpha \geq 0 \dots \dots \dots (3)$$

α measures the index to poverty sensitivity and the arbitrary poverty line represented by z . When $\alpha = 0$, P_2 is simply the headcount index, while when $\alpha = 1$, P_2 is the poverty gap index and when $\alpha = 2$, P_2 is the poverty severity index. When $\alpha > 0$ is decreasing, it signifies decrease in standards of living; people are getting poorer, while the opposite is true. The FGT can be disaggregated into different sub-groups and each sub-group's contribution to national or societal poverty can be determined. However, the method fails to clarify what is the best value for α and the model lacks appeal and cannot be applied on none income-based components of poverty.

The poverty gap index, head count index and poverty severity index more often produce different results of poverty measurement. In Figure 2-4, Coudouel *et al.* (2001) compared poverty gap index, head count index and poverty severity index in 1994 for Madagascar and identified variances in the conclusions regarding poverty by the three poverty measures on the same data. Whilst it was noted from the Madagascar analysis that head count and poverty gap are close in their findings, poverty severity index was markedly different from the head count method.

Table 2-4: Comparison of poverty gap index, head count index and poverty severity index

Orientation	Head count % Po	Rank	Poverty gap % P1	Rank	Poverty severity % P2	Rank
1.Start up farmers	81.6	1	41.0	1	24.6	1
2.Big farmers	77.0	2	34.6	2	19.0	2
3.Untrained workers	62.7	3	25.5	4	14.0	5
4. Fisherman	51.4	4	27.9	3	16.1	3
5. Pensioners	50.6	5	23.6	5	14.1	4

Source: Coudouel *et al.* (2001)

The poverty severity index highlights poverty across groups and this is part of study to determine poverty across locations of Harare province. However, the theory presented do not explain why poverty varies with orientation (groups) which is one of the empirical objectives of the study.

2.4.2.1.5 Sen Index

The axiomatic poverty measure was propounded in 1976 by Sen. It uses the poverty line, utility and individual income characteristics to estimate society's poverty (Sen, 1979:293-298). Sen's axiomatic poverty measurement approach is a break away from the traditional methods as it uses complex mathematical indicators for income or expenditure.

Assumptions of the Axiomatic Model

1. The model assumes that poverty measure is based on some quantification of utility loss from the indigence of the poor
2. Assumes individual utility depends only on the individual's level of income
3. Assumes rank order method decision for equi-distance

The Sen's Axioms are:

1. Focus Axiom- $P(x; z) = P(y; z)$ whenever $x \in D$ and is obtained from $y \in D$ by an increment to a non-poor, this requires that the poverty index be independent of the people above the poverty line (independent from non-poor population).

2. Weak Monotonicity Axiom- $P(x; y) > P(y; x)$, whenever a decrease in poor individual's poverty holding other factors constant leads to higher poverty measure.
3. Impartiality Axiom - requires poverty index to be perfectly defined over ordered incomes of the poor without losing generality of poverty.
4. Weak Transfer Axiom- $P(x; z) < P(y; z)$ ($P(x; z) > P(y; z)$) whenever $x \in D$ and is obtained from $y \in D$, meaning a rise in poverty index happens when the worst poor (poorer) of any two ordered individuals experiences an upward transfer of income while income resource of the poor does not change.
5. Strong Upward Transfer Axiom- $P(x; z) < P(y; z)$ whenever $x \in D$ and is obtained from $y \in D$. A rise in the poverty index happens if the poorer of the two ordered individuals involved obtains higher income is poor. This implies weak transfer axiom.
6. Continuity Axiom- $P(x; z)$ is a continuous function of x on D for any given z . Poverty index must continuously vary with incomes.
7. Replication Invariance Axiom- $P(x; y) = P(y; z)$ whenever $x \in D$ and is obtained from $y \in D$ by an increment to a non-poor, the poverty index does not change if it is constructed basing on income distribution that is spawned k-fold repetition of the initial income distribution.

The first 4 axioms are the most used although researchers concur that the axioms are ethically agreeable. Sen's (1976) various sensitivity axioms are rarely used (Foster, 1984)

The model was developed from the headcount method (H), ($H = q/n$) and the poverty gap ($g_i = \pi - y_i$) which use poverty line to aggregate people whose income falls short of poverty line (Sen, 1979).

Equation (1) is closely related to the poverty gap index which can be given as:

$$I = \sum_{t \in S(\pi)} g_i / qn \quad \dots\dots\dots (1)$$

Equation (1) is the ordinary poverty gap index which measures the total number of people whose income is below π . Equation (1) can then be represented as follows:

$$P = A(\pi, q, n) \sum_{t \in S(n)} g_i v_i \dots\dots\dots (2)$$

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where P is the poverty measure which is the weighted sum of income shortfalls who are defined as poor.

$S(\pi)$ stands for the number of poor people

v_i is the utility of each person which is assumed to depend only on income

g_i is the arbitrary poverty line

i is the i^{th} person

q is the poorest person by order of ranking individual income

The relative deprivation thus can be estimated as follows:

$$v_i = f(r(i)) \dots \dots \dots (3)$$

where:

f is an increasing function;

v_i is the utility of each person which is assumed to depend only on income;

$r(i)$ stands for the rank of i person in order of all individuals experiencing poverty in the order of decreasing income such that i is the poorest person among the poor. If the poor people have similar income, the ordering can be arbitrary ranking.

The poorest have the largest rank represented by q and the least poor is shown as i , the greater the rank the poorer an individual is in respect to others in terms of deprivation as measured by income insufficiency.

From equation (2) we can produce identity mapping which indicates ranked deprivation or Ranked Relative Deprivation (Axiom R) follows:

$$v_i = r(i) \dots \dots \dots (4)$$

The above axiom indicates income distribution among the poor.

We can also generate the Axiom A or sometimes called the Normalized Absolute Deprivation, which can be shown as follows:

$$P = HI \dots\dots\dots (5)$$

From equation (4) Axiom R and (5) Axiom (A)

$$P = H[I + (1 - I)G] \dots\dots\dots (6)$$

where G is the Gini coefficient which indicates income distribution among the poor. Equation (6) is the modified Sen's index that now satisfies both the continuity and strong transfer axioms that are violated by the Sen's index.

When inequality is zero, $G=0$, hence becomes $P = IH$ which is made of absolute deprivation and the ratio deprivation of those deprived.

According to Sen, (1979) income redistribution where some become poorer and others richer (but still below the poverty line), would lead to relative deprivation. A transfer from the poor individual (1) to a richer individual (2) raises the income of (2) hence reduces his shortfall. However, (2) has a lower poverty weight; therefore, this increases the poverty measure.

Sen's poverty measure has been used to estimate poverty in many different societies and countries and is more useful than the ordinary head count and poverty gap ratio mainly because of its 'the intuitive geometric interpretation' (Sharrocks, 1995; Xu & Osberg, 2012). Moreover, the P measure can be varied, hence yield other poverty measures such as P_1 to P_6 (Sen, 1979:304). The axiomatic method has many advantages including axiomatization which enables such as 'it has numerous variants permissible which can be used to yield more poverty interpretations' (Sen, 1979). These include multiplicative decomposition structure which is product of the poverty rate and average poverty gap ratio (Xu & Osberg, 2012). According to Xu and Osberg (2012), Sen's axiomatic method has another advantage in that "it can be justified at both theoretical and ethical soundness and it is easy to communicate with the general public." Axiomatic poverty measure can be used further to combine the number of poor people, depth and distribution of poverty within the economy to produce a poverty measure and according to Xu & Osberg, (2012) this can be shown as follows:

Formally

$$P_s = P_0(1 - (1 - G^P)\frac{\mu^p}{z}) \dots\dots\dots (1)$$

P_0 is the head count index, μ^p is the poor's mean on income or expenditure

G^p is the Gini coefficient which indicates the level of inequality among the poor individuals. G^p ranges from 0 to 1, G^p of 0 implies perfect equality while G^p of 1 signifies presence of perfect inequality.

Sen's Index can be shown as follows:

$$P_s = P_0 G^p + P_1 (1 - G^p) \dots\dots\dots (2)$$

P_s refers to the mean headcount and poverty gap weighted by G^p of the poor

According to Osberg and Xu (2002) Sen's poverty index can also be shown as follows:

$$P_s = P_0 P_1^p (1 + G^{pp}) \dots\dots\dots (3)$$

G^{pp} stands for the Gini coefficient for the poor individuals only

P_1^p measures the poverty gap index of the poor.

Sen's index has not been fully used beyond academics because it is a sophisticated measure compared to other measures. There is consensus that it "cannot be used to decompose poverty into contributions from different subgroups" (Deaton, 1997). Foster, Greer and Thorbecke (2010:518) proposed to relook at the poverty line and the poor identification in order to improve the axioms method, arguing "Can axioms be reformulated to apply to the overall methodology of poverty measurement, including the identification and aggregation step? This is a subtle problem, but one that deserves additional thought." The argument makes sense because the identification method has remained the same since Rowntree (1901) defined it as when "total earnings are insufficient to obtain the minimum necessities for the maintenance of merely physical efficiency as being in primary poverty" (Rowntree (1901). The other weakness of the axiomatic measure is that the model is income based and it excludes dimensions such as social, political and environmental factors which are non-monetary aspects of poverty. Sen's theory is crucial for this study as it enables the study to have introspection into poverty dynamics. To be specific, the axioms enable the study objectives such as transfer, replication, weak transfer and continuity to be used to explain poverty in Harare province and to effectively meet the study objectives.

2.4.2.1.6 Sen-Shorrocks-Thon Index (SST)

SST is the modified Sen's poverty measurement index. The measure can be shown as:

$$P_{SST} = P_0 P_1^P (1 + \hat{G}^p) \dots\dots\dots (1)$$

The (SST) is obtained from multiplying indices of head count, poverty gap of poor and the Gin coefficient of the population of the community. The Gini coefficient near to 1, indicates higher inequality of poverty.

The SST index method was used for Canada between 1984-1995 to determine its provincial poverty. The main advantage of the SST index is that it can be easily decomposed further to give sources of poverty changes over time, this is shown below:

$$\Delta \ln P_{SST} = \Delta \ln P_0 + \Delta \ln P_1^P + \Delta \ln (1 + \hat{G}^p) \dots\dots\dots (2)$$

The above function in equation (2) means % change in SST is equal to headcount index % change plus poverty gap % change for the poor + (1 + Gini coefficient of the poverty gaps). This decomposition allows for further investigations into the poverty trends and answering key questions such as

1. Are there more poor people in the country?
2. Is the poor poorer over a given time?
3. What is the level of inequality in the country among the poor?

SST model has many advantages including that of being simple to comprehend, easy to compute and enables further decomposition into subgroups, (Xu & Osberg, 2012). However, SST method is complex to use for constructing the confidence intervals hence the bootstrapping method is often applied. Bootstrapping is a sampling technique with replacement applied using artificial sampling. The SST index was found to be unhelpful on Canada's Newfoundland between 1984 and 1995 as Osberg and Xu concluded most of the reported periodical changes in rate of poverty were outcomes of deprivation than effect of poverty gap or the number of the poor in the society (Osberg & Xu, 1999). SST index like the Sen's theory presented earlier, enable the study to understand poverty dynamics which is part of the study's empirical objectives.

2.4.2.1.7 Foster, Green and Thornberche

The Foster, Green and Thornberche (FGT) model for poverty measurement was developed in 1984 based on the following assertions:

1. The measure is decomposable into subgroups
2. It fulfils Sen's CA
3. It satisfies relative deprivation

Decomposability entails that total the population's index is derived from various subgroups aggregated together within the society concerned. This also means a change in sub group poverty has an effect on total poverty for the society; hence population poverty is the weighted total of the subgroup poverty. The concept entails that a person or household cannot be deprived of one dimension without being deprived of the other.

Formally, this is expressed as follows:

$$\Pi_{\alpha} = \int 1(y < z)(1 - \frac{y}{z})^{\alpha} dP \dots\dots\dots (1)$$

where, α represents a class of poverty measures and Π_{α} satisfies the monotonicity axiom for values $\alpha > 0$.

At $\alpha > 1$, the index satisfies the transfer axiom $\alpha > 2$ represent the sensitivity axiom

The cross-sectional analysis of FGT or P_{α} thus can be shown as follows

$$P_{\alpha}(y, z) = \frac{1}{n} \sum_{i=1}^q (\frac{z-y_i}{z})^{\alpha} \text{ if } y_i \leq z_i \dots\dots\dots (2)$$

where:

z is the arbitrary poverty line;

n represents the sample size;

q is added total number of families below poverty line;

(α) stands for poverty aversion and when the value is high, it signifies higher poverty and small number means low poverty (Foster, Greer & Thorbecke, 1984; Metzler, 2014).

The $P\alpha(y, z)$ is affected by α as follows:

When $\alpha = 0$, $P\alpha(y, z)$ the head becomes count poverty index;

If $\alpha = 1$, $P\alpha(y, z)$ will be the per capita income gap index and lastly;

When $\alpha = 2$, $P\alpha(y, z)$ becomes the capita gap index squared and it places emphasis on households below the poverty (Foster, 2009) and this was also noted earlier by Zaliak, (2006) that squared poverty (poverty severity) gives more information on poverty and inequality (Zaliak, 2006). The literature is scant on FGT studies for Zimbabwe. However, Ferre' *et al.* (2012) used FGT on eight poor countries (Albania, Brazil, Kazakh-stan, Kenya, Mexico, Morocco, Thailand and Sri Lank) to determine the association between city size and poverty circumstances. The study concluded that FGT (0) which measures poverty intensity and FGT (1) which measures depth of poverty were higher in smaller countries than larger countries such as Brazil and Mexico. The use of poverty lines by FGT is important in explaining dynamics of poverty across groups or locations and it is part of the empirical objectives of the study.

2.4.2.1.8 The Watts index

First proposed by Harold W Watts in 1964, (Watts, 1968) for distribution-sensitive measure of poverty and its discrete form:

$$W = \frac{1}{N} \sum_{i=1}^q [\ln(z) - \ln(y_i)] \dots\dots\dots (1)$$

where N stands for poor people (q) in the population indexed to their expenditure or income (y_i) in increasing order, while poverty line is depicted by (z). Watts's index is a product of dividing poverty line by income and then using logarithms to find the average of the poor. The equation above can be rewritten as follows:

$$\Pi_w = \int 1(y < z) \ln \frac{y}{z} dP \dots\dots\dots (2)$$

The Watts index in equation (2) "satisfies all the theoretical properties basic for a good poverty index, and is increasingly used by researchers in generating poverty incidence curve but it is not a particularly intuitive measure, and so is rarely seen in practical field work" (Zheng 1993). Watts's index satisfies Sen's monotonicity axiom which states that a decrease in income for the

poor increases the poverty measure, assuming a *ceteris paribus* and transfer axioms which states that income transfer from the poor to the rich people in society increases the poverty measure as well as Kakwani's transfer-sensitivity axiom. There is currently no evidence that this model has been used for poverty measurement in Zimbabwe, however the theory is important in noting that income is a determinant of poverty. However, the theory excludes a lot of other poverty indicators that are not easily formulated to mathematical presentations. This study will determine poverty using income and numerous indicators largely explained in Harare province.

aClark, Hemming and Ulph, 1981

The method is related to the SST. The index takes the form:

$$P = \frac{1}{N} \sum_{i=1}^N P(z, y_i) \dots \dots \dots (1)$$

where $((z, y_i))$ is the individual poverty measure. For the non-poor, $(z > y_i)$ takes the value of zero, the index takes positive values for $(z < y_i)$, implying the existence of poverty. The theory clearly distinguishes between poor and nonpoor which indicates occurrence of poverty bands. This is important to the current study's objectives which aim to explain poverty by groups. However, the theory does not effectively provide durational and dynamics of poverty being experienced within each group. Such analysis will be provided in this study of Harare province.

2.4.2.1.9 Bayesian Gini Index

The Bayesian Gini Index is used mainly in the case of pareto optimality to measure income inequality (Mahajan *et al.*, 2015), where the Gini index or Gini coefficient or Gini ratio is given as:

$$G = \frac{\Delta}{2\mu} \dots \dots \dots (1)$$

Δ is the population mean difference which is given below;

$$\text{Where } \Delta = \int_0^\infty \int_0^\infty |x - y| f(x) f(y) dx dy \dots \dots \dots (2)$$

G ranges between 0-1, where 0 indicates 100% income equality and 1 means 100% income inequality. Conversely, the Gini index is the area under the Lorenz curve; given as $G = (1 - 2)$.

$$G = (1 - 2) \int_0^1 L(p) dp, 0 \leq p \leq 1 \dots \dots \dots (3)$$

$$\text{Where } L(p) = \frac{1}{\mu} \int_0^p F^{-1}(t) dt \dots\dots\dots (4)$$

Equation (4) is the Lorenz curve.

μ from equation (3) is given as

$$\mu = \int_0^1 F^{-1} dt \dots\dots\dots (5)$$

Equation (5) is the mean distribution associated with income inequality. This method is closely related to the Foster *et al* method.

Bayesian Gini index is not practical in real life because of the challenges faced in determining the prior distribution which is derived from historical data or experience of the researcher. The method is rarely used due to lack of prior distribution information and time constraints that combined reduce the robustness of the Bayesian Gini Index (Mahajan *et al.* 2015).

Generally, monetary approaches and methods are the most common poverty measure with World Bank, UNDP and Zimstat. The money metric poverty measures such as the poverty line are “simple, easy to remember, and apply to all countries” for generic circumstances (Deaton, 2000). In further studies, Deaton (2001, 138) summarises that: “...in the World Bank’s calculation of the number of poor in the world, separate urban and rural [price] indices are used only for India and China. In other countries, a single index does service for everyone, an expediency that must overstate rural relative to urban poverty.” This makes the World Bank an inefficient measure that lacks endogeneity.

Furthermore, the World Bank poverty measure is performed from assumptions of perfect fungibility of all goods and services conversion into monetary value, for example valuation of subsistence production or valuation of public goods utilities an individual enjoys from using them (Grosh & Glewwe, 2000; Laderchi *et al.* 2003). The welfare or utility maximisation behaviour of the monetary approach remains challenged as the assumption is not always the case or a necessity for human behaviour (Laderchi *et al.* 2003). There is a growing trend on suppression of consumption for health reasons and deliberate increase in services which are not easy to convert into monetary terms. The monetary approach can only hold when the following conditions define poverty:

1. When welfare or utility is the sufficient condition for measuring wellbeing
2. If monetary expenditure and or income is a necessary measure of wellbeing

3. When poverty is solely defined as shortfall in welfare or utility
4. When there is enough justification for a given poverty line

The monetary approach to poverty measurement is skewed towards income and this does not give the full the meaning of multidimensional poverty. The method is rather a short cut to poverty analysis that uses monetary indicators for convenience. It relies on data that is widely available to fully identify poor people within society in dimensions, not resources deprivation but also non-monetary poverty (Laderchi *et al.* 2003).

Another challenge on the applicability of the monetary approach is where to put the poverty line and how to effectively separate between the poor and non-poor. According to Laderchi *et al.* 2003) poverty line is a “minimum cost of the poverty level of utility”, which is never fully defined in existing theory. This is so because it dwells on methodological aspects of the poverty line calculation than theoretical considerations (Ravallion, 1998). Other studies have proposed that two distinct approaches should emerge from the monetary poverty line: the cost of basic goods poverty line and the nutritional based poverty line which would measure food energy intake. The nutrition poverty line remains difficult to measure as humans require different nutrients due to differences in metabolism, size, age, gender and personal preferences (Sukhatume, 1989; Laderchi *et al.* 2003).

Furthermore, the poverty lines are drawn at household level on the assumption that there is equitable distribution of financial resources within the family which never is the case. In most cases, women and children have fewer resources compared to men (Payne, 1993; Laderchi *et al.* 2003). This is not captured by the monetary poverty measures. The issue of poverty lines was further pursued by Ravallion and Chen (2011) who developed a relative poverty line for poor countries. “This poverty line lies in between a fixed absolute line such as the international \$1.25 a day line, and a purely relative one, such as those just discussed. Applying a weakly relative poverty line, the income poverty threshold is proportionately adjusted to an increase in mean incomes” (Dotter and Klasen, 2014).

Also, the use of relative poverty which is common with the monetary approach is a contentious issue as it is driven by political will. Many economies in developed countries define poverty as people in receipt of government funding or grants, however, one way of measuring poverty is to compare those in receipt of government assistance and those without assistance from the government. Atkinson (1989) raised a strong concern on measuring poverty through looking at

government assistance in UK. This leaves this identification of the poor at the sympathy of government budgetary decisions; without enough budget they will never be considered.

The monetary poverty measure faces weakness of aggregation of poverty from individual to community level. The modifications by Sen (1976) and FGT (1984) still is insufficient as aggregate values are related to social valuation and this weakens the monetary poverty measure.

Generally, the monetary approach is still being used by World Bank, IMF and UNDP for poverty measurements at country, regional and international levels. Nonetheless, the monetary approach for poverty measurement fails to address the heterogeneity aspects between individuals in a household, community, country or between countries (Mitlin (2012:7). He goes further to add that:

The Millennium Development Goal Standard of one US dollar a day has become an important benchmark by which the extent of poverty is assessed. However, it pays little attention to differences in the expenditure patterns of different groups of the poor or to the cost differences faced by different groups.

The method also ignores social resources which are important to human life. Further, the method assumes households have similar basket of goods which is inaccurate as consumption patterns at individual or household levels are unique.

The World Bank monetary poverty measurement of one USD\$ per day has been challenged as it does not clarify using nominal exchange rate, Purchasing Power Parity (PPP) in its methodology and also the basket of goods that can be procured by the USD\$ varies from country to country (Nye, 2002; Reddy, 2002). Furthermore, the USD\$ per day principle of World Bank is affected by inflation, for example USA experienced inflation between 1985 to 1993 hence the World Bank's poverty line should change by 8% when analysing and measuring poverty for the period of 1985 to 1993 (Deaton, 2000). However, conversion of figures to accommodate the inflation index for the PPP "distorts the real level of inflation over the stated time period due to the strengthening of the PPP international dollar relative to the currencies of the poor countries for whom the line was created" and it have been noted that the PPP "method of extrapolating and imputing data that is not available to describe national income/consumption levels when conducting calculations of which incorrect extrapolation from limited data leads to mistaken inferences and conclusions about the level and severity of global poverty" (Deaton, 2000:58).

The use of monetary measurement through constructing USD\$/PPP exchange rate assumes the price of goods and services are traded without the imposition of tariffs, barriers to trade such as import restrictions, trade permits and quotas, transportation costs among other protectioneering in various countries. Equally, these monetary measurements do not factor substitution “by the poor nor does it adjust for variances in local staple foods as staple in one country may be a luxury in another” (Deaton, 2000).

The use of PPP “is even more complex when considered internationally” and the conversion is most often inaccurate because it is not based on consumption of the poor but on general consumption (Pogge & Reddy, 2002a: 8–11). There is need for separate baskets for different geographical locations (Ravallion, 2002; Mitlin, 2012) because as noted by Deaton & Tarozzi, (2000: 21) prices in urbanised areas are often 15.6 per cent more than in rural areas and “...for all India, the ‘official’ urban prices are higher than rural prices by 40.8 per cent... and the official urban premium varies across states from a high of 65.2 per cent in Andhra Pradesh to a low of only 15.3 per cent in West Bengal, and is actually negative in Assam.” In Mozambique, Jonsson and Satterthwaite (2000:28) found that the poor uses 30 per cent of their wealth on non-essential food consumption, hence this makes use of PPP an unreasonable method.

The USD\$1 a day in poverty measurement does not provide the list of goods and services that should be made available to the poor for them to meet basic life needs. Defining poor people as those living beneath a dollar a day cannot be relied upon for poverty eradication and management policies and programmes, as noted by Deaton, (2000). Reddy & Pogge, (2000) stressed that the measures ‘do not have corresponding consistency’ for the poor as a cluster study found that the ‘poverty lines are normally below the level delineated for poverty measurement while other poverty lines are projected far above the international poverty line. Poverty estimation using the monetary poverty lines is systematically dependent on the year which the measurement was done.

To deal with the weaknesses of poverty line measurement method, Deaton proposed “to create a PPP exchange rate that applies specifically to a relevant bundle of goods that meet the needs of the poor such that the prices obtained would give greater meaning to the line that is established” (Deaton 2000). Blackorby and Donaldson (1987) proposed use of welfare ratios which uses indifference curves to differentiate the poor and non-poor as a substitute to PPPs. Satterthwaite (1997 & 2001: 146) provided a list of economic factors in support for a broader poverty measurement that includes “eight aspects of urban poverty: inadequate income; inadequate unstable or risky asset base; inadequate shelter; inadequate provision of public

infrastructure; inadequate provision of basic services; limited or no safety net; inadequate protection of poorer groups' rights through the operation of law; and poorer groups' voicelessness and powerlessness". Some of these dimensions and indicators require multidimensional approach s they cannot be easily quantified into monetary.

2.4.3 Multidimensional Poverty Measures

2.4.3.1 Alkire and Foster method

The A–F multidimensional poverty index M_0 is a direct product of the headcount ratio of poor individual's H and mean deprivation share among the poor A

$$P_{\alpha}(y, z) = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^{\alpha} \text{ if } y_i \leq z_i \dots\dots\dots (2)$$

where terms (z , n , q and α) are

z is the poverty line;

n is the sample size;

q is the number of poor families and;

(α) is a non-negative number symbolic of poverty aversion, where higher values emphasize the poorest of the poor (Foster, Greer & Thorbecke, 1984; Metzler, 2014).

This dual-cut-offs spells approach mandates resources be spent in the same period as

measured (not transferred across periods), and equally weights all spells (no special

treatment for early, late or contiguous spells). The index sums P_{α} values for each period

a unit meets the duration condition. Both P_{α} and K_{α} , τ measures are decomposable, allowing for closer examination of subpopulations" (Metzler, 2014).

Stoeffleet *al.* (2016) applied the AF methodology to measure poverty in Zimbabwe. The study used data from household survey conducted by Zimstat using ICES and PICES data for the periods 2001, 2007 211 and 2012 to construct a multidimensional poverty. The study concluded that there was a decrease in poverty in Zimbabwe. Stoeffleet al (2016) concluded "consistent with the recovery of the Zimbabwe economy after 2008, findings show a clear and significant decrease in poverty incidence between 2007 and 2011–2012 for all levels of k (–11.0% for $k \frac{1}{4}$

3). The multidimensional poverty incidence is higher in 2011–2012 than it was in 2001, and the change between the two periods is relatively small but statistically significant for all k (+7.5% for $k = \frac{1}{4}$ to 3). This finding suggests that the recovery ameliorated the adverse effects of the economic crisis in aggregate across multiple dimensions, but the effect of the crisis on multidimensional poverty was still tangible three years into recovery.

The model does not input geographical differences, assuming that people have the same cost of living. Further, the model does not include subsidies, tax credits and food assistance. Metzeler suggested “monetising consumption and tax-based assistance partially fills the income gap and may lift a family out of poverty in terms of disposable income” (Metzeler, 2009)

2.4.3.2 Bourguignon-Chakravarty (2003)

Uses cross sectional dimensional measure which assigns values to poverty gaps within each dimension

$$BCh = \sum \left[\left(\sum_{j \in d} w_j x_{ij} \right)^{1/\theta} \right]^\alpha, \theta > 0, \alpha > 0 \dots\dots\dots (1)$$

Where:

x_{ij} Represents normalized poverty gap for dimension j for observation variable i

w_j is the weight of dimension j .

θ is the parameter of the BCh function that measures the elasticity of substitution

α is the parameter of the BCh function.

2.4.3.2 Bourguignon-Chakravarty theoretical presentation is very crucial in developing poverty analysis for Harare province. The use of weighting is key as dimensions and indicators should be weighted in order to be objective in analysis.

2.4.3.3 Human Development Report (HDR)

Developed in the 1990s, the HDR represented a mega-shift from income poverty reliance for poverty measurements. “Human development is a process of enlarging people’s choices. The most critical of these wide-ranging choices are to live a long and healthy life, to be educated and to have access to resources needed for a decent standard of living. Additional choices include political freedom, guaranteed human rights and personal self-respect. Human

development thus concerns more than the formation of human capabilities, such as improved health or knowledge. It also concerns the use of these capabilities, be it for work, leisure or political and cultural activities” (HDR, 1990:1).

HDR report measured poverty on three aspects which are:

1. Income;
 2. Life expectancy;
 3. Education (literacy).
- From 2010, the HDR adopted the MPI and HDR was no longer used for poverty measurement but only to assess poverty and deprivations households face in respect to health, education and living standards (UNDP, 2010:93-95).

2.4.3.4 UNDP Multidimensional Poverty Index (UNDP MPI)

The UNDP MPI has been had continuous improvements on the Human Development Report (HDR) since 2010 through the work of Alkire and Santos and up to 2014, it has been based on Oxford Poverty and Human Development Initiative (OPHDI) (Dotter & Klasen, 2014). The advent of SDGs in 2015, together with continuous improvements of survey questions for data on SDG indicators, helped to refine the UNDP MPI in 2018 (UN, 2015; Kovacevic, 2015) and this coincided with Third Decade on Poverty Reduction agenda (2018–2027) as noted by Alkire and Jahan (2018).

The method uses people-centred dimensions and indicators to measure the level of deprivation to monitor the Sustainable Development Goals (SDGs), (Alkire& Jahan, 2018). The thrust of the UNDP measure is to promote human development approach to poverty than economic development approach. In essence, it “measures acute multidimensional deprivations in over 100 countries, covering well over 90 percent of the population in lower- and middle-income countries and over 75 percent of the population of the earth” (Alkire & Jahan, 2018).

The MPI is closely related to headcount method as it measures the size of population in poverty through indicators (weighted). The MPI is made up of 3 dimensions, 10 indicators and weights.

The dimensions, indicators and weights for UNDP MPI are shown in Table 2-5.

Table 2-5: 2018 MPI: UNDP dimensions, indicators, deprivation cut off and weights

Dimension	Indicator	Deprived if living in the household where	Weights
Health	Nutrition	An adult <70years or undernourished child	1/6
	Child Mortality	Infant mortality in the family for the last 5 years	1/6
Education	Years of schooling	10yrs and above members in the family who finished six years of education	1/6
	School attendance	If any child dropout < 8 th class in the household	1/6
Standard of Living	Cooking fuel	Backward sources of cooking energy; cow dung, firewood, charcoal or coal.	1/18
	Sanitation	Poor household sanitation measured using SDG guidelines or sharing sanitation facilities	1/18
	Drinking Water	Unsafe sources of drinking water using SDG guidelines) or more than 30-minute round trip to fetch drinking water	1/18
	Electricity	Non electrified or lack access to electricity	1/18
	Housing	Inadequate roof, walls and floor; natural materials used for housing	1/18
	Assets	The household lacks more than 2 assets from given list of household assets such as; radio, computer, bicycle or car	1/18

Source: UNDP, 2018

Households are defined as multidimensionally poor if they experience deprivation in at least 1/3 of the weighted indicators above.

According to UNDP, the data used in MPI is obtained from DHS, MICS and national household surveys. There are inherent data constraints which leads to missing data sets in some countries on some indicators hence, proxies are often applied (UNDP, 2014).

There are numerous advantages of UNDP MPI. Firstly, it reminds that eradicating poverty requires the adoption of broader social and economic dimensions for a more comprehensive conceptualisation of poverty than solely relying on economic growth. The simultaneous use of monetary and human poverty aspects by the UNDP enables the policy makers to grasp the social and economic poverty prevailing in the economy and enable undertaking of verification for certainty on the effect of economic and social programmes at country level.

The UNDP poverty measure is user friendly and can be applied by both experts and non-experts to mobilize the public, catalyse the financial support of donors, and increase the political will of governments” (Mowafi, 2019). It also has the advantage of being able to systematically show progress made on a yearly basis on poverty upliftment and the gaps that policy makers

must attend. The UNDP poverty measure is not sensitive to market fluctuations that use money metric measures (Mowafi, 2019).

The disadvantage does not provide headcount threshold of people underneath a certain bound hence, gives policy makers little information on resources to be mobilised in order to fight poverty. The measure only gives the general incidence of poverty as measured by the three dimensions. With more time, resources and high degree of accuracy in the demographic information, headcount can be obtained from the population. The MPI does not measure poverty inequality amongst the poor (Rippin, 2011). The measure contradicts Sen's pronouncement that a good measure should provide the following

1. Poverty incidence (total number of the poor)
2. Poverty intensity, thus, to indicate the mean number of deprivations being suffered)
3. Poverty inequality amongst the poor.

Aspect (3) is not determined by the MPI poverty measure as it assumes poor people suffer same level of poverty, which in real life is incorrect.

The 30% cut-off aspect of the MPI is a huge disadvantage of the measure, although it is intended to factor inflation into the poverty rates (Rippin, 2011).

The UNPD method leaves questions as to why only three dimensions are profiled when poverty has many aspects not catered for in UNDP MPI? Other researchers (Mowafi, 2019) have supported that using three dimensions “keeps the measure simple to understand and keeps policymakers focused on the main issues contributing to human poverty.” There is the misgiving that too many dimensions and indicators lead to ‘confounding effect.’ UNDP MPI remains an inconclusive measure “which requires additional indicators to provide a more detailed account of other important causes of poverty that perhaps should not be overlooked.” An increased number of dimensions and indicators could make the measure conclusive and more meaningful in poverty measurement (Mowafi, 2019).

In its own admission, the UNDP agreed that there are system weaknesses. First, there is enormous data constraints hence they end using proxies (judgment) which in some cases hugely inflate poverty or grossly deflate deprivation. The methodology uses both outputs (such as period of schooling) and inputs (source of domestic fuel) and stock determinant factors

(infant mortality) and thirdly inequality amongst the poor and the poverty intensity are never computed (UNDP, 2014).

The UNDP is a composite measure and there are always downside risks of aggregating and weighting various indicators to generate a single poverty measure, “no matter how much effort is put into ensuring that weights appropriately represent the overall circumstances within a population” (Mowafi, 2019). Despite being imperfect, adaptation of the UNDP poverty measure assists researchers by providing an important tool for poverty evaluation throughout the development process.

To improve on the challenges of MPI highlighted, there “are arguments to include additional dimensions such as powerlessness, deprivations of rights, violence, shame, time use, among others, there is often no data available and there is disagreement about which dimensions are appropriate” (Dotter & Klasen, 2014). Furthermore, Ripinn (2011) proposed the use of Correlation Sensitive Poverty Index (CSPI). CSPI involves counting indices and considers the correlation amongst poverty indicators.

Each household would get an extra weight depending on the number of items the household lacks. The method CSPI allows capturing of inequality between the poor. The model has no cut-offs required and CSPI have little distortions. However, the CSPI does not capture relationships between indicators. Comparison between MPI and CSPI on 28 countries showed big differences in poverty indices, as the MPI poverty rates were deflated in less poor countries and highly inflated in poorer countries. MPI reported poverty rate of 0 whilst CSPI reported poverty to be 0.4% in Yerevan, whilst in Niger the MPI reported poverty of 64.2% whilst CSPI reported a poverty rate of 47.5% (Rippin, 2011). Furthermore, Sen criticised the use of a ‘list’ of dimensions for measuring poverty arguing that: “to have such a fixed list, emanating entirely from pure theory, is to deny the possibility of fruitful public participation on what should be included and why” (Sen, 2005:158).

2.4.3.5 Social exclusion

According to Silver (1994: 544) the concept of social exclusion was originally established by Rene´ Lenoir during the 1970s when the term ‘*les exclus*’ was used in France to refer to people mentally challenged, physically handicapped, aged invalids, drug addicts, single parents and other cases of social misfits who fell under social security programs. SE is closely related to

Townsend proposition of defining deprivation as people who are excluded from normal living standards (Townsend, 1979:31). “The concept of social exclusion (SE) was developed in industrialised countries to describe the processes of marginalisation and deprivation that can arise even in rich countries with comprehensive welfare provisions” (Laderchi *et al.* 2003).

SE analyses “how individuals or groups are wholly or partially excluded from full participation in the society in which they live” (European Foundation, 1999). SE is method of poverty measurement used by EU for its social policy including the Lisbon Council of March 2000. SE has also been extended to developing countries through UN (Clert, 1999).

According to Laderchi *et al.* (2003) social exclusion occurs when an individual in society (a) cannot participate in activities which they normally should; (b) would like to participate in such activities if given an opportunity to do so. Barry on the other hand argued that a person is excluded if (a) and (b) conditions hold in spite of one’s willingness to participate (Barry, 1998).

In Zimbabwe the government has a Department of Social Welfare under the Ministry of Public Service, Labour and Social Welfare that aims to reduce poverty amongst the disadvantaged population using three:

1. Family and social protection services;
2. Rehabilitation and Private Voluntary Organization (PVO) Administration;
3. Policy and projects.

The main programmes spearheaded by the government of Zimbabwe include social cash transfers to the poor in rural areas. This category caters for the old and vulnerable, the orphaned and the physically handicapped. In 2018 alone a total of USD\$500 million was advanced towards socially excluded people across Zimbabwe (pslsw.gov.zw). People in acute food shortage are also helped by Food Deficit Mitigation Programme which is an assistance programme from government in the form of maize and monthly allocation of cereals to the poor and vulnerable groups. Government and PVO also offer health and public assistance to the socially excluded (pslsw.gov.zw). The main partners for government of Zimbabwe social programmes aimed at fighting social exclusion are:

1. European Union;
2. Spotlight initiative;

3. Royal Norwegian Embassy;
4. Centre for Applied Legal Research (CALR);
5. World Vision
6. Schweizerische.

This SE for Zimbabwe involves unconditional monthly cash allowance for maintenance of disadvantaged and vulnerable households (MPSLSW, 2020).

The concept also applies to delinquents, multi-problem households such as single parent household, women headed families and family with breadwinner unemployed (Hick, 2012). These people are excluded from basic political, social, economic and cultural dimensions (Evans, 1998; Stewart *et al.*, 2007; Hick, 2012). Social exclusion includes a wide range of aspects than mere resource insufficiency (Burchardt *et al.* 2002) and the concept allows for a focus on both individuals and groups where group membership itself is a cause of exclusion (Stewart *et al.* 2007).

According to Room (1995: 233:4) and Hick, (2012) social exclusion enables poverty analysis to be broadened on three important aspects:

1. Allows analysis from a community perspective rather than individual perspective;
2. Enables analysis to switch from predominantly unidimensional of poverty to multi-dimensional analysis and;
3. Creates a dynamic poverty analysis rather than static analysis

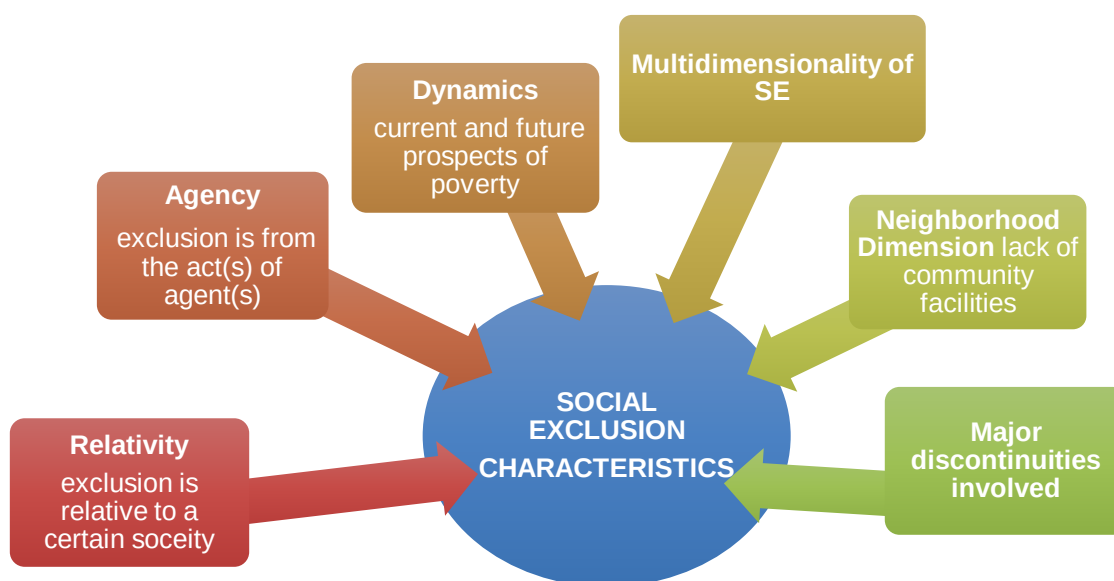


Figure 2-7: The main characteristics of Social Exclusion

Source: Atkinson, 1998

Figure 2-7 above depicts the main characteristics of Social Exclusion. These features of a social exclusion approach have been challenged (Burchardt *et al.* 2002) due to lack of clarity as to what exactly the measure is trying to achieve. From this representation, it is not clear whether the social exclusion is a process or outcome, as it only counts the number of socially excluded and notes their characteristics but does not monitor the process to identify the causes of entry or exit into poverty (Hick, 2012). 'Nonetheless, the concept of SE is often used to consider a broader conceptual terrain in poverty measurement' (Hick, 2012). The dynamic aspect of the social exclusion is one of its advantages, making it different from the Capabilities Approach (Stewart *et al.* 2007).

The SE differs from the MA and CA approaches in that it highlights the process of being poor which is lacking in other studies. SE methodology pins multidimensional aspects as intrinsic features of poverty measurement. SE has a stronger link to monetary approach because lack of income is identified as both source and outcome. Furthermore, the features of SE are society specific and this makes poverty comparison between societies a challenge since developing countries are likely to differ from developed economies (Laderchi *et al.* 2003:256-257).

Also, important aspects are not clearly distinguished in the SE such as implications of using normalcy. Laderchi *et al.* criticises the SE as "lack of formal sector employment or social insurance coverage therefore does not imply exclusion from normal social patterns or relationships. To the extent that the normal may not be desirable, what is 'normal' may not be

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satisfactory in defining the benchmarks of exclusion. There is a serious problem in deciding what would be appropriate SE characteristics” (Laderchi *et al.* 2003:259), Micklewright (2002:7) also observes that “exclusion is a concept that defies clear definition and measurement.” SE is difficult to apply in developing countries because “normality is particularly difficult to define in multipolar societies, and because there can be a conflict between what is normal and what is desirable.” Micklewright (2002:7)

SE has been defined differently in prior studies. Appasamy *et al.* (1996) for India, defined SE as exclusion from the life basics such as health, education and social security. In Venezuela, Cartaya *et al.* (1997) defined SE using political and social rights and poverty was when people lacked these rights. For Tanzania, researchers into the urban poor occupations and rural landless categorise these as excluded (Rodgers *et al.*, 1995). ILO Tunisia study used perceptions of various social groups for social exclusion and this produced different results (Bedoui & Gouia, 1995). Separate studies done in Cameroon and Thailand used ethnic minorities as traits of the socially excluded. In Thailand, other categories such as poorly educated, farmers, informally employed and the homeless were used as markers of exclusion (Rodgers *et al.* 1995).

2.4.3.6 Capability Approach

2.4.3.6.1 Sen’s Functioning and Capability Axiomatic Approach.

Sen (1976) criticised the monetary poverty measures due to their insensitivity to the redistribution of income among the poor. He introduced an axiomatic approach stating that poverty is a condition of deprivation of capabilities. CA “strongly rejects utilitarianism of monetary income” as its measure of well-being, and alternatively uses freedom to live a valued life. Furthermore, CA believes that life as a set of “doings and beings—called functionings—and these relate to evaluation of the quality of life to the assessment of the capability to function” (Sen, 1993:2). In Sen’s framework, poverty is seen as deprivation, or failure to achieve society’s certain minimal standards such that it reduces mortality and morbidity. Deprivation includes lack of basic capabilities such as being sufficiently nutrified or having liberty and to do normal movements, having self-confidence, having self-respect and full participation in society projects (Sen, 1993:41; Laderchi *et al.* 2003:253-255).

CA measures wellbeing as individual freedom as people can be satisfied with physical neglect and valuation neglect (Laderchi *et al.* 2003). Sen acknowledges “lack of income can be a

principal reason for a person's capability deprivation and a strong predisposing condition for an impoverished life" (Sen, 1999: 87).

According to Hick (2012) the capabilities approach highlights several ways of how human life is blighted. The theory mainly concentrates on what people are able to do rather than what people have or feel. Sen proposes that analysis of poverty and wellbeing should shift from predominantly 'means of living' such as expenditure and income to 'actual opportunities an individual has' (Sen, 2009:253). The focus is on real or 'substantive freedoms as opposed to formal' (Hick, 2012:3), the "functionings are constitutive of a person's being, and an evaluation of a person's well-being has to take the form of an assessment of these constituent elements" (Sen, 1993).

The CA constitutes an alternative poverty measurement approach of abstracting human behaviour, measuring well-being and determining policy objectives, based on non-utilitarian and utility maximisation as a behavioural assumption. Monetary aspects are only seen as a way enhancing wellbeing rather than an outcome of interest (Sen, 1993; Laderchi *et al.* 2003).

The functionings are the various aspects person accomplishes 'in doing or being' such as community participation. On the other hand, the capabilities define the substantive freedoms people need to achieve the functionings such as ability to participate in society's life activities (Sen, 1999:75). The various capabilities that define wellbeing are: the capabilities to functions, capabilities to freedom of choice, capabilities to agency role and capabilities to self-esteem. Figure 2-8 below highlights Sen's capabilities that define wellbeing.

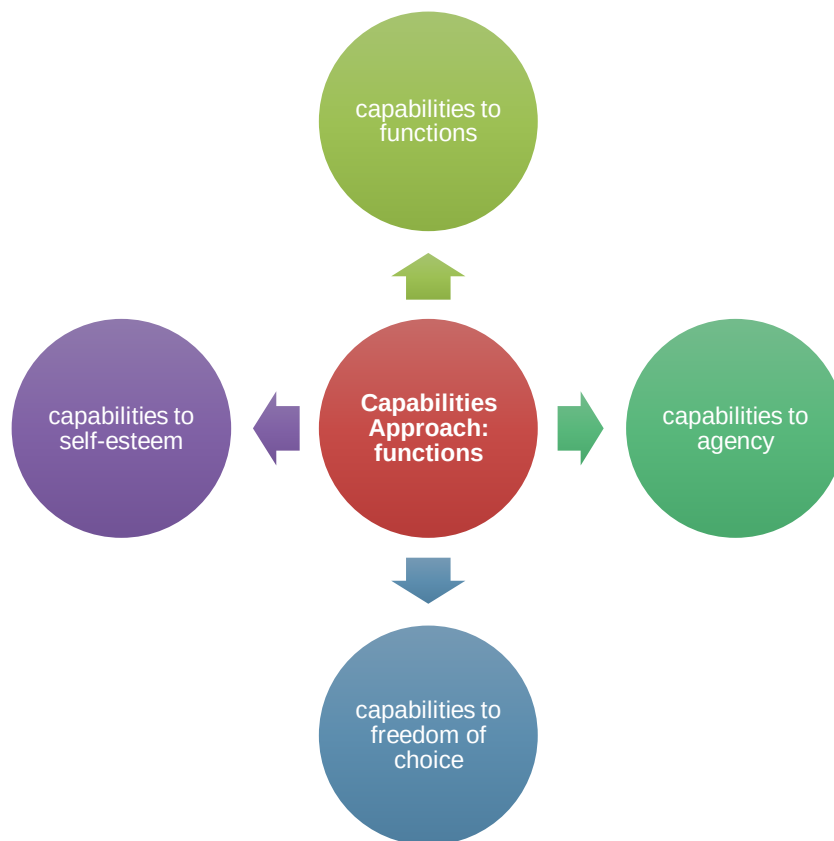


Figure 2-8: Capabilities that define wellbeing: Sen

Source: Researcher's own presentation

According to Hick, (2012), the selection of functionings and capabilities is part of 'informational space' of analysing poverty in the context of the normative focus of poverty and justice among other capabilities rather than conceptual analysis.

As Sen, (1995:15) proposed, the capabilities vary from primary or elementary physical life aspects such as having enough shelter, having sufficient clothing, absence of morbidity and enough food to more complicated social aspects such as confidence in public appearance and community participation. Table 2-6 below is a presentation of Capabilities Approach from various sources. Clearly there is agreement across various researchers of what to include in CA basic capabilities and measurement.

Table 2-6: Presentation of Capabilities Approach

a) Define basic capabilities Wellbeing thus; a. Life: full expectancy b. Health: decent health, well-nourished and proper shelter c. Bodily integrity: association; reproduction choices d. Senses: imaginings and believes, knowledgeable by education e. Emotions: affections f. Practical reason: critical consideration and life organization g. Affiliation: social interaction; protection against discrimination h. Other kinds: respect for nature and living in harmony with other species i. Play j. Control over one's environment, by making politically and material choices	b) Measurement of capabilities i) all conceivable accomplishments an individual may have (capability set) transformed into measurable phenomena.
c) Poverty line projection i) arbitrarily expresses in terms of poor or otherwise.	d) Aggregation use of FA, fuzzy sets and UNDP human development index to obtain data-driven weights in aggregating deprivations,

Source: (Sen, 1993; Ravallion, 1998; Nussbaum, 2000; Laderchi, 2001)

Sen questioned the income poverty method for poverty measurement as income is a means to opportunities of intrinsic value to people, hence income is both instrumental to achievement of capabilities and is a contingent variable (Sen, 2009: 233). Sen used the variability concept for conversion of resources (means) into capabilities and also determined that people have varying needs which require different levels of resources to achieve similar standards of living (Hick, 2012:4). The capabilities approach prioritises intrinsic values of what people can do or can be with given set of resources. It is a theory that is 'unambiguous in favour of direct approach to poverty analysis' (Hick, 2012:4).

CA provides a lucid methodology of defining poverty in the context of the quality of lives people live and the liberties they enjoy. This approach is more multidimensional than the monetary approach in the form of social goods. In addition, the CA provides dynamism in poverty measurement. It offers situational measurement of poverty, which is important in poverty

analysis, (Laderchi *et al.* 2003). Schokkaert and Van Ootegem (1990) applied the capabilities approach for Belgium and concluded that material aspects were insignificant in measuring poverty but a wider array of factors beyond material being. Further studies were done (Slottje, 1991) using 20 indicators drawn from capacities theory on 126 countries to develop quality of life index. There is no clear evidence the model has been used for Zimbabwe poverty measurement. Nonetheless, CA to a larger extent, exhibits the individualistic approach of the monetary approach as capabilities are features of the individuals although it then portrays achievements at society level and use of poverty line remain challenged. These are imposed without the theoretical framework to support how to project such. According to Mowafi (2019), Sen highlighted the main advantages of his theory as follows:

1. CA emphasises intrinsic poverty and deprivations beyond income. Income is seen as a mere instrument;
2. There are many determinants of capability deprivation other than income poverty;
3. Connection of low income and low capability varies with communities, families, and individuals.

The CA brings a multidimensional approach lacking in other poverty theories (Atkinson *et al.*, 2002: 79). Capability approach offers a “way to reconcile the tension between narrow and broad approaches to poverty by respecting the former, while not losing sight of the latter” (Hick, 2012). Lister (2004: 18) argues that to determine poverty in terms of failure of capability is to “conflate poverty with an altogether broader notion such as quality of life or well-being, because not all ‘ill-being’ is related to a lack of resources” (Hick, 2012:15). According to Nolan and Whelan (1996) the CA links poverty and resources, “focus is required because some of the most vulnerable members of society experience circumstances that may not immediately be due to a lack of resources: homeless people, drug and alcohol addicts, functional illiterates and those who have suffered physical or mental abuse” (Volkert, 2006). This is also confirmed by Hick who contends that CA highlights “deprivations that are enforced and not voluntary non-participation” which is not readily available in most theories of poverty measurement, (Hick, 2012:13).

Sen’s CA main weakness as noted by Mowafi (2019) is that he “does not make clear one way or the other whether his immediate goal is complete capability equality.” This led to establishment of the Nussbaum who urges that the most imminent task is to take the poor to some minimum threshold where they should not be propped up. It is proposed that there are demands about what we shall do when everyone is above the threshold. Further, Nussbaum’s criticism is that

Sen's theory does not "take a stand" on what the central capabilities must be. There is need to have a constructive normative framework than mere theoretical pronouncements.

Lister (2004) criticised Sen's Capability Approach stating that: "[it] is doing something different to a poverty approach since not all capability deprivation arises because of a lack of resources and, thus, would typically not be considered to be a case of poverty". Also, capability and poverty are different in conceptualising poverty. The major question the capability approach considers is 'what matters?' The poverty question is a strong conceptual question, while the capability approach is an ethical question regarding poverty. The distinction between these questions offers an idea of the relationship that exists between the capability and understanding poverty (Hick, 2012:296). Furthermore, CA approach focuses on what humans can do in their lives and totally ignores how they feel about their lives or what they own and this makes the CA a biased measure (Hick, 2012:292).

The CA varies from previous studies. For instance, Townsend determined ethical appeal to human needs (1970: 18) and for Nolan and Whelan (2011: 33) what should be avoided by people if they could. "But human needs and problems which all would wish to avoid inevitably extend to both monetary and non-monetary dimensions, which imposes a requirement to adopt a framework which can consider both" (Hick, 2012). More so, CA does not consider other constraints "which impede participation such as disability or discrimination and while these are conceptually distinct from a lack of resources, they cannot be seen as being of no importance." (Hick, 2012:294).

Walker joins the list of critics of the CA methodology for poverty measurement, arguing that "there is a valid case for a list, but this should be for specific purposes, or evaluation or critique. It should not be fixed or canonical, it should not be hierarchically ordered, and it should in some way include participation and dialogue" (Walker, 2006: 49).

2.4.3.6.2 Nussbaum Capability Approach

Nussbaum developed her theory which is closely related to Sen. Sen accepted "that this approach would indeed be a systematic way of eliminating the incompleteness of his capability approach" (Sen, 1993:47). Both researchers agree on the importance of freedoms in development and that political and economic rights are equally important and should not be viewed separately. Both theories agree on the weakness of the Rawls theory of social justice and the utilitarian methodologies. "Nussbaum is more explicit about distinction with her principle of each person's capability and also moves further from Sen by defining a threshold level of

capabilities that must be achieved to ensure that all individuals are able to secure a necessary level of human dignity” (Mowafi, 2019). According to Nussbaum, the very important task is to take every member of the society above some minimum threshold which itself is a daunting task (Nussbaum 2000:12). The theory proposes that society should come up with minimum universal capabilities that must meet the minimum standards (Nussbaum 2000).

Nussbaum proposed a list is a “freestanding moral core of a political conception.” The list does need acceptance of “any particular metaphysical view of the world, any particular comprehensive ethical or religious view, or even any particular view of the person or of human nature (Ibid: 76).” It is an “open-ended and humble” list that may be revised to cater for differences in societal and cultural contexts.

The Nussbaum theory is made up of a) basic capabilities, b) internal capabilities and c) combined capabilities and these are explained below.

1. Basic Capabilities are the prerequisite capabilities for development of more advanced capabilities
2. Internal Capabilities are these are individual specific and may require time and further training to develop
3. The combined Capabilities are innate to an individual; however, they require external support at community, government and family to develop. Table 2-7 shows aspects of Capabilities by Nussbaum.

Table 2-7: Nussbaum List of Capabilities

Dimensions	Indicators
1. Life	Prevention of early and premature death
2. Bodily health	a. Being adequately nourished b. Having generally good health c. Having good reproductive health d. having shelter
3. Bodily integrity	a. having general, oneself bodily control such as b. protection from assault c. prevention of child abuses d. having reproductive choices
4. Senses, Imagination and thought	a. use their sense of reason and being protected by political freedoms and enough education
5. Emotions	a. being free to love, b. being free to grieve,

Dimensions	Indicators
	c. freedom to experience longing, d. freedom for gratitude and justified anger, e. free from overwhelming fear or anxiety;
6. Practical Reason:	a. having freedom to form a personal conception of the good and to plan one's own life;
7. Affiliation	a. having freedom to engage in various, and personally determined, b. freedom for social interactions, c. being free from humiliation, d. having the social bases of self-respect, and e. having protection from all forms of discrimination
8. Other Species	a. being able to interact freely with nature;
b. Play	a. being able to laugh, play, and enjoy recreational activities;
b. Control over One's Environment	a. having fundamental political and economic rights such as b. guarantees of political participation, c. ownership of property, and d. equal opportunity to employment.

Source: Nussbaum (2000)

Sen is against the idea of instituting a set of capabilities and he insists on the 'deliberate incompleteness' that valuation ranking and individual choice are critical precursors to the experience of freedom" (Mowafi, 2019). Nussbaum's proposition of eliminating religious and ethical settings and the blanket assumption "that all people everywhere can reach complete agreement about a foundational set of capabilities, independent of metaphysical, religious, or ethical concerns", is often challenged, (Mowafi, 2019).

Sen challenged the Nussbaum theory and in response said "may be tremendously over-specified, capability approach as such does not require taking that route, and the deliberate incompleteness of the capability approach permits other routes to be taken which also have some plausibility" (Sen, 1993:47). Also, the Nussbaum theory of poverty measurement although it is an alternative capability method, "in practice it shifts to become an evaluative process" and does not tell us "who gets to make the decisions of what constitutes 'universally valuable capabilities'" (Mowafi, 2019). Nussbaum used India study to test the applicability of this approach but determined that India's cultural, religious, societal, political cannot be used as a base of the theory. It is recommended that the theory adapts and asks questions such as "who gets to decide?" and "under what authority?", which are critical questions not pursued by the theory (Mowafi, 2019).

2.4.3.7 Participatory Approach

The MA, CA and SE have been criticised for being exogenously imposed measures in the broad sense that they do not take the views of poor people as constructs in poverty measurement and analysis. According to Laderchi *et al.* (2003) the participatory approach (PA) was first developed by Chambers (1994 & 1997) and is aimed at getting poor people themselves to openly participate in decisions about what it means and how it feels to be poor and the extent of poverty they suffer in their lives (Laderchi *et al.* 2003). Mowafi recently posited that: “who is better to inform poverty assessments than the poor themselves?” (Mowafi, 2019). The PA is defined as “a growing family of approaches and methods that enable local people to share, enhance and analyse their knowledge of life and conditions, to plan and to act” (Chambers, 1994:57). PA originally used as a set of participatory poverty assessments (PPA) mainly from participatory rural assessments (PRA).

Before World Bank’s adoption of the method, the PA was mainly common with small projects at community level of poverty measurement (Laderchi *et al.* 2003). Cornwall (2000) advises that there are three types of PA which are:

1. PA related to self-determination and emancipation or empowerment;
2. PA related to increasing efficiency of programs;
3. PA encouraging mutual learning.

de Graft Agyarko (1998) and Laderchi *et al.* (2003) concluded that PA is applied by collecting the society specific information on cultural, social, political and economic aspects prevailing within the locality. PA is applied by determining the wellbeing, perceptions and indicators from individuals through social mapping and wellbeing groupings of the people in a given society set up. Assets at community or rural level (in the case of Zambia study) such as community property, access to services and natural resources are measured through resource mapping and focus group discussions. Household assets are determined through wealth ranking and poor households’ analysis. For determination of crisis management, PA uses livelihood analysis and structured interviews for ranking analysis. For community-based support poor households receive, the PA uses institutional mapping and interviewing the poor. For environmental aspects such as pollution or soil fertility, PA uses resource mapping and trend analysis and historical transects. These are depicted in Table 2-9 below:



Figure 2-9: Participatory approach implementation methodology

Source: Laderchi *et al.* (2003)

The method deploys a wide range of participatory mapping, use of periodic calendars, poor people's resources and welfare rankings at household level. This gives the method a better measure of poverty and enhances flexibility which is not available from other poverty measures.

In a practical example of PPA, World Bank measured poverty based on PPA method and a total of 300 reports were submitted and 78 were its famous 'voices of the poor'. The 78 reports were compiled from 47 Africa, 30 Middle East, 16 Latin America, 12 from Caribbean South Asia, 10 from East European and Central Asia, and 10 from East Asian countries. The sample sizes used were mostly between 10 and 100 communities, and some between 100 and 5,000 people. The cost variations noted were between \$4,000 - \$150,000 (Narayan, 1999). However, the data were not uniform from country to country hence this affected comparison significantly.

Oyen (2001), challenged the notion that "the poor are the true experts on poverty." The poor could be less technical in explaining their poverty but poverty conditions are not static, they perpetuate their conditions (Oyen 2001). Oyen further asserts that it is not essentially the factors (indicators and dimensions) that affect anti-poverty such as social networks and empowerment but "poverty is functional for certain interests such as those that profit from cheap and flexible labour to which they have no commitment. Efficient poverty reduction is not possible without facing up to the adversaries and vested interests" (Oyen 2001).

The study proceeds to compare the four different poverty measures discussed above using seven variables from unit of measurement to policy decision making. The comparison will provide with clear analysis of the different poverty measurement approaches. Table 2-8 provides a clear comparison of 4 most popular poverty measures.

Table 2-8: Comparisons of money metric, Sen's Capability, Social Exclusion and Participatory approach

Variable (s)	Money metric measures	Sen' capability (CA)	Social Exclusion (SE)	Participatory Approach (PA)
a) Unit of measurement	Individuals to derive household	Individual	Both individual and groups	Groups and individuals within groups
b) Minimum standard	Consumption information both external and internal	List of defined dimensions	Set Society standards	Society's own perceptions
c) Main weakness of conceptualizing	Utility based	Dimensions are arbitrarily chosen	Too broad and difficult to compare across societies	Perceptions of interviewed does not represent everyone's sentiments.
d) Inter-society comparisons challenges	Poverty lines (poverty datum lines) and price indices vary over space and time	Adding up methodology mostly applied under CA makes the concept difficult to apply across societies	SE lines vary from society to another	Varies across societies and comparison not objectively achievable
e) Challenges with Data accessibility and availability	Household surveys are not 100% error proof and omitted variables affects results	Data sets not regularly collected or updated affecting efficiency of the measure	Largely rely secondary data sets collected for other aims	Data mostly not available for national measurement
f) Weakness in actual poverty measurement process	Use of arbitrary poverty lines not universal across societies	Multidimensional indicators and dimensions are too many	Data capturing process is too cumbersome	Comparison and representation of the data to society
g) Policy and decision making	Mainly for monetary growth aspects such as GDP and Inflation	Helps with advice on public services and human basic needs priorities for the country	Inclusion and social services delivery	Empowerment of the economically disadvantaged

Researcher's own presentation

2.4.3.8 The Fuzzy Approach

Related to Aristotle's "Law of Excluded Middle" which ignores the likelihood of obtaining a statistically significant value other than "true" or "false," Zadeh (1965) formally introduced the Fuzzy approach to poverty measurement. He classified people between "class of rich people" or "the class of poor individuals", where the movement from one class to another is gradual. The Fuzzy set, "is a class with a continuum of grades of membership". The Fuzzy method allows analysis of both vertical and horizontal vagueness of poverty, by letting some level of poverty in each unit of measurement (household or individual) for each poverty dimension in the poverty measure constructed. So, households are defined as poor or non-poor and households belong to only one group (poor or non-poor). The model has two critical values, below means a household 'absolutely' belong to the poor group membership while the maximum point means the household 'absolutely belongs to the non-poor group membership.

The Fuzzy methodology formally:

Put as X's elements $x \in X$, hence, any subset B of X is defined as follows:

$$X \in B \Leftrightarrow f_B(X) = 1 \dots\dots\dots (1)$$

$$X \notin B \Leftrightarrow f_B(X) = 0 \dots\dots\dots (2)$$

$f_B(x)$ is the household membership function of the set B.

We now assume a population of A of n households, such that;

$$A = (a_1, a_2 \dots a_n)$$

Hence any household a_1 is defined in poverty or non-poor if the following conditions hold;

$$a_1 \in B \quad \text{if } y_i < z$$

$$a_1 \notin B \quad \text{if } y_i > z, \text{ where}$$

z represents the poverty line

y_i refers to the income for the i^{th} household

B represents the set for the poor household

In principle, a household is wholly included or wholly excluded and no other options i.e., no midpoint for partially poor or partially non poor. Hence the subset of B of the elements $X \in B$ can be shown as;

$B = \{X, fB(x)\}$ where;

$fB(x)$: $X [0, 1]$ represents membership of the fuzzy set B

$$fB(x) = \begin{cases} 0 & \text{if } X \notin B \\ 1 & \text{if } X \in B \end{cases}$$

for all $0 < fB(x) < 1$

Hence, according to Cerioli and Zani (1990) the fuzzy membership of the poor can be shown as;

$$\frac{\sum_{j=1}^k \mu_{X(ij)} w_j}{\sum_{j=1}^k w_j} \quad \text{where } i = 1, 2 \dots n \dots \dots \dots (3)$$

Where w_1, w_2 represent generic system of weights

$f(x_i)$ represents the individual Global Poverty Index

$\mu_{X(ij)}$ measures the actual deprivation of item j.

The Totally Fuzzy Approach was later incorporated through qualitative variables that would measure certain indicators of poverty. This can then be resolved by rearranging the value in ascending order and the higher the number the higher the risk of poverty. Thus, the membership function for the Totally Fuzzy can be put as;

$$\begin{cases} 1 & \text{if } 0 < X_{ij} < X_{jmin} \\ \frac{X_{jmax} - X_{ij}}{X_{jmax} - X_{jmin}} & \text{if } X_{ij} \in [X_{jmin}, X_{jmax}] \\ 0 & \text{if } X_{ij} > X_{jmax} \end{cases} \dots \dots \dots (4)$$

Where X_j represents households in a risk situation to poverty in respect of attribute j (where $j=1,2,\dots,n$).

The values X_{min} and X_{max} , are such that, if $x < X_{min}$, the household will be defined as poor of that indicator, whereas, if $x > X_{max}$, is non-poor (Cerioli & Zani, 1990).

The Totally Fuzzy and Relative Approach (TFR) applies the concept of relative approach to poverty measurement in which one is poor compared to other households and a low risk of poverty entails higher level of non-poor. From equation (4) we can drive the membership function and the poverty indicator as shown below

Membership function

$$\mu_{bj}(i) = F_j(\xi_j i) \dots\dots\dots (5)$$

Where F_j is the distribution function and;

$\mu_{bj}(\xi_j(m-1))$ is the membership function for household for which ξ_j takes the value of m

The poverty indicator (mp)

$$m_p(i) = \frac{\ln \frac{1}{f(i)}}{\sum_{i=1}^n \ln \frac{1}{f_i}} \dots\dots\dots (6)$$

The equation (6) was advanced by Vero and Werquin (1997) as a way of resolving multicollinearity amongst variables when using the Fuzzy approach.

Where f_i stands for individuals who are as poor as individual or household i .

From equation (6) we can drive the poverty membership function as follows;

$$\mu_p(i) = \frac{m_p(i) - \text{Min}[m_p(i)]}{\max[m_p(i)] - \text{Min}[m_p(i)]} \dots\dots\dots (7)$$

According to Zedini (2020), “the fuzzy set theory has significantly contributed to this classical approach and applications have flourished throughout the world.” However, in Africa evidence shows that it has only been used in Tunisia where Grade-of-Membership (GoM) were used to obtain fuzzy latent structure of multidimensional poverty.

2.4.3.9 Arithmetic Mean of the Fuzzy method

Ceroli and Zani (1990) devised the arithmetic mean to determine poverty (P) for the whole population by using arithmetic mean for the individual indices. The method is related to the fuzzy approach. This is shown below:

$$P = \frac{1}{n} \sum_{i=1}^k f_{(xi)} \dots\dots\dots (1)$$

P stands for the total number of households or individuals that are in the fuzzy subset of the poor obtained through a generalized fuzzy head count of the poor individuals.

$f(x_i)$ only assumes values (0, 1) as from the fuzzy approach and this imply that when B is not a fuzzy subset, P becomes the head count ratio of the poor.

The Fuzzy theory provides a lot of theoretical foundations for the study on Harare province. For instance, the membership to fuzzy group enables the Harare study to develop for its imperical objectives poverty categories. It is also noted that income is a key poverty indicator and will be used for the study. However, the fuzzy sets do not explicitly provide the durational nature of poverty obtaining in each subset. This is crutional to answer objective pertaining durational poverty for Harare province.

2.4.3.10 Euclidean Distance Function Approach

Although it is very popular in efficiency analysis in production theory, Lovell *et al.* (1994) were the first to apply it to poverty measurement using distance functions. The measure projects how much the attributes (i.e., income) of the poor must be improved to meet the benchmark and this is called the distance function method in social science or the gauge approach in field of mathematics. This is shown below:

$$D(x_i, w) \equiv \min d\{d: W(dx_i) = W^*, d > 0\} \dots \dots \dots (1)$$

x_i represents the number of attributes in the i^{th} household

W is the weighting function being used

W^* represents the yardstick weighting function.

d stands for the distance measure: which is the minimum amount by which household resources (i.e., income) or other attributes must be scaled up tor down to reach the yardstick level.

The (x , W and W^*) are important components of the distance approach.

To make the distance approach operational, the first step is to aggregate households' data on welfare and household characteristics and subsequent normalising of the characteristics. Deutsch and Silber (2005) used the trans log function basically obtained from normalising one of the characteristics. This is shown as below:

$$X = \begin{pmatrix} x_{11} & x_{12} & x_{1m} \\ x_{21} & x_{22} & x_{2m} \\ \dots & \dots & \dots \\ x_{n1} & x_{n2} & x_{nm} \end{pmatrix} \dots\dots\dots (2)$$

Where j (j=1, 2...m) represents attributes

x_{ij} represent group membership function for households I, where i=1,2...n shown in rows

m is the group membership function q (q= 1, 2...m) as shown in columns

From above, household with 0 deprivations (HB) is shown as;

$$HB = \max x_{11}, \max x_{12}, \max x_{1m} \dots\dots\dots (3)$$

Household with maximum poverty (deprivations) is given as

$$WB = \min x_{11}, \min x_{12}, \min x_{1m} \dots\dots\dots (4)$$

Euclidean Distance Function Approach is very critical in the study for Harare as far as meeting the imperial objectives is concerned. The theory uses many attributes (dimensions and indicators) to measure poverty and this is exactly the case of the study. Furthermore, the theory will benefit the study by enabling the study to understand how weights are used in designing a poverty measure. It is also noted that income is an important poverty measure which the study for Harare province should consider. However, the Euclidean Distance Function Approach does not provide durational poverty analysis. Durational analysis is important as poverty is not static between periods and this is one of the empirical objectives of the Harare poverty analysis being persued by this study.

2.4.3.11 The Entropy Weight Method

Entropy is used to determine uncertainty of information. It was noted by Shannon and Weaver (1947) that entropy portrays in relative terms the importance of its corresponding criterion in as far as amount of the information it contains is concerned. It highlights intrinsic contrast in intensity of the corresponding criteria. The entropy weight can be specified as follows:

$$Ew_j = \frac{d_j}{\sum_{k=1}^m d_k} \dots\dots\dots (1)$$

Where j =1,2..., m

$$d_j = \sum p_{(ij)} \log_2 p_{(ij)} \text{ for } i = 1, 2, \dots, m \dots \dots \dots (2)$$

$$P_{ij} = \frac{x_{ij}}{V_i} \dots \dots \dots (3)$$

$$V_i = \sum_{j=1}^n X_{ij} \dots \dots \dots (4)$$

Entropy is used to determine uncertainty of information but provides with intensity of a variable being measured. In the cas of poverty, the theory enables the study to explain the importance of each of the poverty indicators by determining their weights. It was noted by Shannon and Weaver (1947) advised that the theory enable intrinsic analysis of a variable, this will enable the study to decompose poverty and determine poverty occurance across various loactions in Harare province.

2.5 DURATIONAL POVERTY MEASURES

Most poverty measurement methods (Se, 1976; UNDP, 2018-2020; World Bank, 2018), the FGT and Watts poverty measures and indices capture and measure static poverty. Time invariant measurement of poverty is insufficient and biased in revealing the actual poverty because poverty is dynamic and most people experience it in their life time either transitory or permanent poverty. The chief question remains for how long and how often? (Clark *et al.* 1981; Chakravarty, 1983; Baulch & Hoddinott, 2000). Durational measurement of poverty helps to understand why people enter or exit poverty and this information helps crafting effective poverty policies. There is therefore a need to measure poverty by using tools that help to “examine the relationship between household poverty status, household characteristics, and the events that households experience” (Mckernan & Ratcliffe, 2002). The important question is how long do people stay in poverty once they enter it? Hence, intertemporal poverty measures help policy makers understand the effect of poverty persistence both short term and long term on the deprived population and the number of resources that should be made available to support the population facing poverty spells (Stevens, 1998). The most common poverty measures for durational analysis are:

1. Tabulation/ count method;
2. Life Table method;
3. Bivariate hazard method;
4. Multivariate hazard method;

5. Components of variance method;
6. Foster Poverty Duration Adjusted Index (2009)
7. Kaplan–Meier

2.5.1 Tabulation/ count methods

The method involves counting the number of people entering or exiting poverty over a given time frame. The method offers a simple way of examining poverty dynamics and “the tabulation method is well-suited to measuring poverty entry and exit rates, as well as the total number of individuals or families entering and exiting poverty in a given time period” (Cellini, 2008). The method involves obtaining data set in order to “tabulate the actual distribution of completed spells for people who began a spell in some previous year long in the past. One could also tabulate the distribution of completed spells for those people who were poor at some time in the past” (Bane & Ellwood, 1985). The method can be applied as shown below in Figure 2-10:

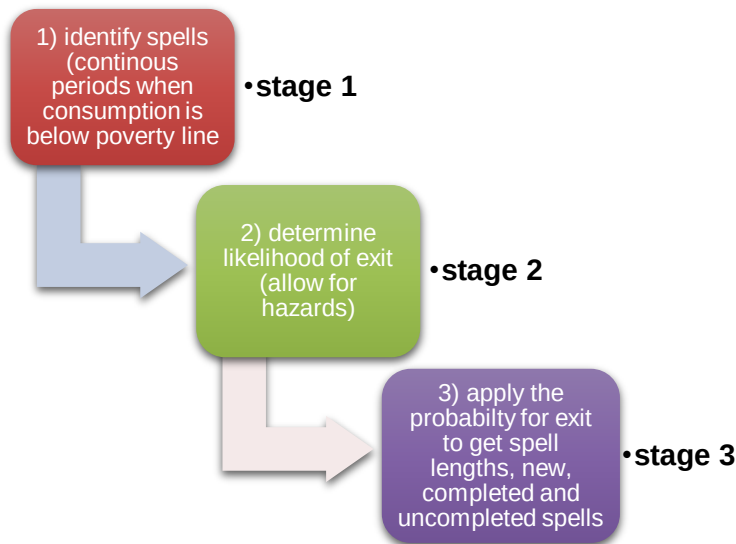


Figure 2-10: Tabulation/ count method application

Source: Researcher's own illustration

The spells are defined periods when households (individuals) income or expenditure are less than the constructed poverty line after being above the poverty line at some point. The probability of exiting poverty is calculated from standard errors and sample sizes. If the likelihood that an individual who has been poor for (t) period would be non-poor in the succeeding year is shown by the exit probability $p(t)$. The following distributions can be derived:

$$D(l) = p(l) \dots\dots\dots (1)$$

This can be rewritten as follows

$$D(t) = p(t) [1 - \sum_{j=1}^{t-1} D(j)], \text{ for } T > t > 1 \dots\dots\dots (2)$$

where $D(t)$ represents number of people whose spells will last t years or simply the exit probability

T is the maximum length of the spells

$\sum_{j=1}^{t-1} D(j), \text{ for } T > t > 1$ represent surviving to period t-1

Hence surviving to maximum length (T) can be shown as

$$D(T) = [1 - \sum_{j=1}^{T-1} D(j)], D(T) \dots\dots\dots (3)$$

The completed spells of poverty can be measured, thus assuming no growth rate (static state of the economy) is as follows;

$$F(t) = \frac{tD(t)}{\sum_{j=1}^T jD(j)} \dots\dots\dots (4)$$

If F(t) gives the fraction of all individuals on the programme at a given time period in years who would be poor

The distribution of uncompleted spells of the poor can be shown as

$$G(t) = \frac{[1 - \sum_{j=1}^{t-1} D(j)]}{\sum_{s=1}^T [1 - \sum_{k=1}^{s-1} D(k)]} \dots\dots\dots (5)$$

G(t), is derived by calculating the portion the number of persons who “began spells *t* years earlier who would still be on the program (and renormalising) assuming a steady state”. The count method helps to identify the distribution of completed spells of poverty, those who were not poor last year but who are poor this year as poverty is dynamic (Bane & Ellwood, 1985:11 & Cellini, 2008). Generally, only a small percentage of people who enter into poverty during a point in time (year) are chronically poor as some will find themselves up above the poverty line within a given time (Bane & Ellwood, 1985).

In America Bane & Ellwood, (1985) found the probability for poverty exit for first timers to be 0.45 while people who were 4 to 5 years in poverty were found to have a 0.21 chance of exiting poverty. Women headed families had longer poverty duration compared to male headed families, however ‘Spells of poverty from birth are the longest despite the gender, averaging 8 to 17 years, hence, children born are prone to extremely longer periods of disadvantage than those born in better families (Bane & Ellwood, 1985). The model assumes the major causes of poverty are monetary related to fall in earnings of the family head, fall in spouse (wife) income and retrenchment and found that 14% of poverty spells can be eliminated by social grants and development partners’ projects (Bane & Ellwood, 1985) but did not reveal the actual disbursements that are sufficient and necessary for poverty spell elimination. The exiting findings show that 23% of poverty ends with increase in women’s income than increase in men income and according to (Bane & Ellwood, 1985) this is rarely tested further.

According to Cellini, (2008) “the tabulation method is well-suited to measuring poverty entry and exit rates, as well as the total number of individuals or families entering and exiting poverty in a given time period”, but ‘ it is less straight forward’ and require further distinction between new spells and spells started as proposed by (Gottschalk *et al.* 1994) The model was not used in a

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multidimensional approach in which social, political, economic and environmental aspects are put into perspective.

Also, the method was used by Bane & Ellwood (1985) concentrated on the young, casting a blind eye on the older poor assuming they would be dead before the end of the study. This in itself is a weakness as the poverty dynamics of the old is never considered. The study assumed a generic poverty across the spell but in real life poverty differs from society to society and this should be considered together with non-metric poverty aspects to widen the net and include all forms of poverty. However, there is no evidence that such kind of study has been used in Africa.

The method involves the compilation of household income and demographic data of households for several life tables for a period of 25 years in order to determine “the extent to which specific events occurs across intervals of time” (Rank & Hirschl, 1999).

Rank & Hirschl (1999a & 2001) pointed out that periodic effects are flattened across ages, thereby reducing generation specific impacts on poverty measures. Several life tables constructed can then be used to “estimate the risk of poverty across the adult life span, specifically, the periods of early adulthood (ages 20 to 40), middle adulthood (ages 40 to 60), and later adulthood (ages 60 to 80). The construction of different age groupings “allow for a comparison of the risk of poverty across the major stages of adulthood” (Rank & Hirschl 1999a). The tables are easy to use for statistical analysis but become more complicated with the introduction of more variables. This makes the tables unsuitable for analysis of durational poverty.

In the case of Harare, there is scanty evidence that the theory has been used to explain poverty. It would have been insightful to the study to analyse poverty entry and exit in Harare. The main weakness of the model is sole reliance on income and demographic characteristics as determinants of poverty spells. Poverty should be explained beyond income as various indicators should be adopted and used to explain poverty. As noted earlier, poverty is not generic which the theory tries to put, poverty circumstances vary across households, locations and societies and this requires further exploration beyond this theory. It is also not clear what events lead to poverty exit, entry or re-entry, this analysis is key to provide policy recommendations to policy makers.

2.5.2 Life table method

Sometimes called the basic hazard rate model (Stevens, 1999)., the model was first used by Bane & Ellwood, (1986). The probabilities of exiting poverty spells are calculated for a given particular spell duration through adding up individual spells for consecutive years for when income was below the poverty line, then estimate the probability of ending the spells however, an allowance for probability to vary during the spells is provided in the calculations, (Cellini, 2008). The hazard of exiting poverty spell that has lasted 1 year is found by calculating the number of people who experience poverty for at least a year. Three distinct durations can then be generated(i) new spells; ii) completed spells and iii) uncompleted spells. Life table examines the extent to which events occur and is a common method with demographers and medical researchers (Rank & Hirschl 1999). The applicability of this theory in the context of Harare has not been established as there are no studies that used this theory for the city of Harare. Life tables is common in medical researches and not poverty studies, hence remains a mere theory that still require further interrogation in poverty studies.

2.5.3 Bivariate Hazard Methods

The bivariate hazard method advanced by Stevens and it calculates the probability of re-entering poverty from time to time (Cellini, 2008). It estimates two hazard rates: one for leaving poverty, and one for returning to poverty” (Stevens, 2008).

Assuming the likelihood of exiting poverty in a specified year for known durations follows a standard logit specification hence; such that] the probability of ending a poverty spell after (d) years is given by a hazard function:

$$\lambda_{idt}^p = \frac{\exp(y_{idt})}{1+\exp(y_{idt})} \dots \dots \dots (1)$$

Where;

$$(y_{idt})=\alpha_d^p + \beta^p X_{it} \dots \dots \dots (2)$$

i stands for the indices for individuals

t stands for time in years

d represents the durational indices for the current poverty spell

The hazard in equation (1) depends on the features of (y_{idt}) which is made of

$\alpha_d^p \rightarrow$ effects of other variables in X_{it} such as dummy variables that vary across time and people

P separates the hazard rate for ending poverty spell from the hazard of ending non poverty spell, hence the probability of observing a completed poverty spell of length (d) can be shown as;

$$f^d = [\prod_{s=1}^{d-1} \frac{1}{1+\exp(y_{ist})}] [\frac{\exp(y_{idt})}{1+\exp(y_{idt})}] \dots \dots \dots (3)$$

The first part of the equation (3) $[\prod_{s=1}^{d-1} \frac{1}{1+\exp(y_{ist})}]$ states the probability of not exiting poverty spell in each of the years until d years.

$[\frac{\exp(y_{idt})}{1+\exp(y_{idt})}]$ represent the probability of ending the poverty spell in d years. However, poverty can sometimes continue after the spell sample period and this can be shown as follows;

$$1 - F(d) = \frac{1}{1+\exp(y_{ist})} \dots \dots \dots (4)$$

Equation (4) represents the probability of witnessing a right censored spell, thus poverty beyond the normal sampling period.

The probability of re-entering poverty after exiting it in equation (3) can be modelled using λ_{idt}^n as shown below in equation 5

$$\lambda_{idt}^n = \frac{\exp(z_{idt})}{1+\exp(z_{idt})} \dots \dots \dots (5)$$

where

$$(z_{idt}) = \alpha_d^n + \beta^n X_{it} \dots \dots \dots (6)$$

Equation (5) is our hazard function of returning to poverty after exiting in prior years.

d stands for the duration individual has been out of poverty after exiting.

The determinants (hazards) of individual's return to poverty is (z_{idt}) , which is a function of individual/ household characteristics X_{it} and effects of spell duration α_d^n .

We can now calculate the probability of an out of spell poverty lasting d years, and this is shown below;

$$g^d = [\prod_{s=1}^{d-1} \frac{1}{1+\exp(z_{ist})}] \frac{\exp(z_{ist})}{\exp(z_{ist})} \dots \dots \dots (7)$$

From (7), the likelihood of a right censored spell, thus spell beyond the survey period can be given as;

$$1 - G(d) = \prod_{s=1}^d \frac{1}{1+\exp(z_{ist})} \dots \dots \dots (8)$$

The bivariate method is easy to use and interpret (Cellini, 2008). The key assumption is that the duration of the spell is known except for the case of non-poverty and “with no role for unobserved heterogeneity or omitted variables, estimation using only spells beginning after the start date of the sample would give consistent estimates of poverty transition rates for the population” (Heckman & Singer, 1984). The idea of selecting the duration of spells induces selection bias to the model as in real life duration spells are not always known. The method is criticised in that it can cause overestimation during estimation of exit and re-entry hazard if duration of left spells (non-poverty) is not included in the estimation. Because of the risk of overestimation bias, Moffitt & Rendall, (1995; and Stevens (1999) proposed to introduce the left censored spells which uses all historical information on household and employ unobserved heterogeneity variables. Bivariate hazard method remains a theory without empirical foundations in the case of Harare province. This is so as there is no single evidence of the study in Zimbabwe and Harare province in particular.

2.5.4 Multivariate Hazard Method

The method uses regression to examine individual's transition from poverty state to above poverty state through a continuous observation of the individuals in each period until transition occurs. The critical periods are the period they lived poverty line and the first period they lived above poverty line thresholds and this method is better than the bivariate method. (Cellini, 2008) According to McKernan and Retcliffe (2002), multivariate method “provides information about the probability of experiencing an event at time t (e.g., exiting poverty) given that the event has not occurred prior to time t (e.g., the person is in poverty in the period prior to t , $t-1$)”. Exiting poverty is a determined by any of the following explanatory variables characteristics of the family head (race, education and attainment, religion, gender) and other variables such as economic indicators, geographic features and trigger events such as number of prior year spells, duration of current spell, left censored spells identifiers and year identifiers.

The multivariate uses multiple events to explain poverty transitions from poverty spell to above poverty life by using separately the poverty entry and exit tractable (logit lies between 0 and 1) logit specifications equations.

The probability of person i entering or exiting poverty over period of time t can be shown in a logit specification as follows

$$P_{it} = \frac{1}{1+e^{-Y_{it}}} \dots \dots \dots (1)$$

where,

$$Y_{it} = \alpha_t + d'T_{it} + \beta'X_{it} \dots \dots \dots (2)$$

Where T is the transition events

X represents the control variables

Some of the causes of poverty spells are;

Young children born in poverty, loss of income (employment), loss of a spouse (single headed family), disability over time, economic down turn that affects GDP and unemployment rate and family transition from being a male headed to female headed household. Poverty exit is the opposite of the poverty entry.

The likelihood of entry or exiting poverty spells transit (changes) when the event occurs which is obtained by:

1. Calculating the individual's probability of entry when event is assumed to have occurred;
2. Calculating the individual's probability of entering poverty in the event of non-occurrence of the event;
3. The difference between the two-average probability (i and ii) offers an estimation of how the chance of entering poverty or exiting in the event of poverty occurrence changes.

The multivariate analyses establish that events are related to the "likelihood of entering and exiting poverty including changes in household composition, employment, and disability status" but most importantly, "individuals living in households that experience an employment change are the most likely to enter and exit poverty." It was established that 12,3% poverty entry is caused by loss of employment (McKernan & Retcliffe, 2002). More specifically, "if the household

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head stops working this month, the probability of entering poverty is higher by 11.1 percentage points, and if the household head stopped working at time t-1, t-2, or t-3 the probability of entering poverty differs by 1.1 percentage points, 0.3 percentage points, and -0.2 percentage points, respectively” McKernan & Retcliffe, 2002).

The Multivariate Hazard is ‘more flexible as other variables such as individual head factors, family factors, geographic factors and spell duration into hazard models of poverty entries, exits, and re-entries (Cellini, 2008). However, the above findings need further interrogation as pension, insurance and grants can propel people away from poverty spells. The ability of the theory to determine probability of entry and exit into poverty is a benefit to poverty studies. However, the theory has not been attempted on Harare or any province in Zimbabwe.

2.5.5 The Components of Variance Method

Developed by Lillard and Willis (1978), the method is based ‘on decomposition of Friedman’s economic theory of permanent to transitory income. It uses the components of variance to quantify the permanent and transitory overall distribution of income.” The method removes the weakness of the arbitrary poverty line by assuming an “unchanging underlying permanent income to needs” with possible departures (Cellini, 2008). According to Bane and Ellwood (1986), from the decomposition of income, two distinct groups of poor are possible and these are (i) permanent poor (ii) transitory poor.

As Lillard and Willis' (1978) put it, the individual earnings and income-to needs can be shown as follows;

$$Y_{it} = X_{it} + \varepsilon_{it} \dots \dots \dots (1)$$

Whereas;

$$\varepsilon_{it} = \alpha_{it} + u_{it} \dots \dots \dots (2)$$

And

$$u_{it} = \rho u_{it,t-1} + V_{it} \dots \dots \dots (3)$$

Y_{it} is the log of income to needs ratio of the individual?

X_{it} stands for determinants variables such as age and year effects

Error term contains person specific α_{it} and transitory term that allows AR (1) pattern

Equation (1 to 3) imply the covariance for the population ε_{it} can be shown as

$$Cov(\varepsilon_{it}, \varepsilon_{is}) = var(\alpha_i) + \frac{\rho^{|t-s|}}{1-\rho^2} var(v_{it}) = \sigma_\alpha^2 + \frac{\rho^{|t-s|}}{1-\rho^2} \sigma_v^2 \dots\dots\dots (4)$$

According to Stevens (1999), equation (4) can further be shown by population covariance matrix $(f(\sigma_\alpha^2, \rho, \sigma_v^2))$ by ‘developing a column vector c , the matrix formed from the residuals of separate regressions of the year of the income to needs ratios, age of the family head, age squared, race, education gender of the family head, this is depicted below’,

$$(c - f(\sigma_\alpha^2, \rho, \sigma_v^2))(c - f(\sigma_\alpha^2, \rho, \sigma_v^2)) \dots\dots\dots (5)$$

The major weakness of the model and in particular to poverty analysis in the case of Zimbabwe is that it predicts constant variance over time. Stevens, (1999) also states that it “assumes an underlying permanent income-to-needs level, it does not allow for easy incorporation of poverty transitions involving changes in household structure, as other methods do, components-of-variance method is less well-suited to account for permanent changes in economic status that may accompany events like divorce, remarriage, widowhood, or a long-term disability.” Finally, this method does not give an estimation of events associated with poverty transitions which are either entering or exiting poverty (Bane and Ellwood 1986; Stevens, 1999).

2.5.6 Foster Duration Adjusted Poverty Index

The static poverty measure developed by Foster, Green and Thornberche was adapted by Foster (2009) to develop a time bound poverty measure for durational poverty. Foster Duration Adjusted Poverty Index makes use of double cut-off during identification such that an element (unit of identification) i is considered deprived in a given dimension j if its result y_{ij} is less than threshold z_j . Household or unit i is defined poor if the deprived dimensions when weighted; $ci > k$, where k is the threshold. The weight on each dimension is derived from investigating the significance of that dimension to i household’s nourishment. If a household is identified as poor, everyone within the household is automatically determined to be poor. The A–F MPI $M0$ is the product headcount ratio (H) of poor people and the average deprivation (A) share among the people in poverty.

$$P\alpha(y, z) = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^\alpha \text{ if } y_i \leq z_i \dots\dots\dots (2)$$

Whereas earlier discussed the terms (z, n, q and α) are;

z is the poverty line;

n is the sample size;

q is the number of poor families and;

(α) is poverty aversion and a small number represents low poverty whilst a higher poverty aversion figure means higher poverty (Foster, Greer & Thorbecke, 1984; Metzler, 2014).

Foster (2009) applied time into the equation (2) above to move the static nature of $P\alpha$ to a dynamic function $K\alpha, D$, Where D is the duration line which measure as a percentage of observations spent in poverty. Hence, the Foster poverty duration adjusted index can be presented as follows;

$$K\alpha, D(y, z, t) = \frac{1}{nT} \sum_{t=1}^T \sum_{i=1}^q \left(\frac{z_t - y_{i,t}}{z_t} \right)^\alpha \dots\dots\dots (3)$$

Where (y, z, n & q) are defined as in equation (2).

T is the total number of periods

This “dual-cut-offs spells approach mandates resources to be spent in the same period as measured (not transferred across periods), and equally weights all spells (no special treatment for early, late or contiguous spells). The index sums $P\alpha$ values for each period α unit meets the duration condition. Both $P\alpha$ and $K\alpha, \tau$ measures are decomposable, allowing for closer examination of subpopulations” (Metzler, 2014).

Stoeffleet *al.* (2016) applied the AF methodology to measure poverty in Zimbabwe using Zimstat household data from ICES and PICES for periods 2001, 2007–2011 and 2012 to construct a multidimensional poverty. The study concluded that there was a decrease in poverty in Zimbabwe. Stoeffleet *al.* (2016) concluded that:

Consistent with the recovery of the Zimbabwe economy after 2008, findings show a clear and significant decrease in poverty incidence between 2007 and 2011–2012 for all levels of k (–11.0% for k $\frac{1}{4}$ –3). The multidimensional poverty incidence is higher in 2011–2012 than it was in 2001, and the change between the two periods is relatively small but statistically significant for all k (+7.5% for k $\frac{1}{4}$ –3). This finding suggests that the recovery ameliorated the adverse effects of the economic crisis in aggregate across multiple

dimensions, but the effect of the crisis on multidimensional poverty was still tangible three years into recovery.

The model was criticised for not factoring geographical differences and assuming people have the same cost of living. Further, the model does not include subsidies, tax credits and food assistance. Contrary, Metzeler suggested “monetising consumption and tax-based assistance partially fills the income gap and may lift a family out of poverty in terms of disposable income” (Metzeler, 2009).

2.5.7 Kaplan and Meier Method

Developed by Kaplan and Meier (1958), the model is a nonparametric spell measure common in duration poverty. It uses probabilities to determine poverty exit and or entry. The measure gives the percentage of people in poverty after given time (t). It also predicts the percentage of those who exit poverty in different periods and finally it estimates poverty in various poverty spells (Ghebru & Holden, 2019).

The probability of new poor surviving as poor and the probability of non-poor surviving as non-poor can be given as:

$$F^{\wedge}(t) = \prod_{i|t \leq t_i} \left(\frac{n_i - f_i}{n_i} \right);$$

Where $F^{\wedge}(t)$ is the chance of surviving past time t

n_i is the total number of individuals at poverty risk at time t_i

f_i is the number of unsuccess at time t_i

Kaplan–Meier nonparametric method measures the duration until an event occurs and is common in science models to estimate incomplete observations. Furthermore, the K-M model is mainly descriptive and cannot be used for time dependent variables; it only measure survival over time of time independent dimensions and finally the model does not regulate covariances hence there is little evidence that the model has been used in many poverty durational measures

2.6 TRENDS OF POVERTY

Poverty trend is an important in modern economics as many governments, people and development organisations IMF, World Bank, ADB & UN etc., are worried about recession and

inflation which is estimated by various statistics over time (Atkinson, 1987:1). Various theories have been proposed in order to analyse poverty trends over time. Understanding poverty trends enable policy makers to identify macroeconomic policies that can be used to change the course of poverty. Most of the available poverty trends analysis methods are based on developed economies and have not been used in developing economies. The study analyses the existing poverty trend methodologies available to determine poverty trends.

2.6.1 Poverty Lines

Most economies use arbitrary poverty lines to analyse poverty trends over time, although the use of poverty lines have remained contested (Eigbiremolen, 2018). Poverty lines are constructed using minimum expenditure on basic goods for a household and the basic goods consists of food and non-food items. Ravallion (1998:1) postulated that:

One role of poverty lines is to determine what the minimum level of living is before a person is no longer deemed to be poor. The other role is to make interpersonal comparisons; poverty lines for families of different sizes and compositions, living in different places, or for different dates, tell us what expenditures are needed in each set of circumstances to ensure that the minimum level of living needed to escape poverty is reached.

Poverty lines enable trend analysis in households, national and regional expenditure. It also forms a basis for determining relationship between consumption (expenditure) and economic growth and finally it enables measurements in inequality trends over time (Edward, 2014:210).

Lanjouw and Lanjouw (1997) prosed that calculating poverty lines from time to time increases robustness of the method in poverty trend measurement. Further studies on the concept by Atkinson (1998:1) noted that:

Poverty line rises with average income is one determinant of how responsive measured poverty will be to economic growth. Assessments of the effects of economic growth on poverty have often assumed that the poverty line is fixed in real terms (after normalizing by a cost-of-living index). Some analysts have argued that the real value of the poverty line should shift positively with mean national income, implying lower elasticities of poverty to growth. Indeed, the European Commission sets its poverty lines at one half of the mean in each country, implying that an equi-proportionate increase in all incomes (including of the poor) would leave measured poverty unchanged.

The other weakness is that the approach makes country, regional and international poverty comparisons difficult as they use different poverty lines and the differences in data sets used to define the poverty lines. Types of poverty lines used to measure poverty over time are the cost

of the poverty level of utility, the cost-of-living index/ Welfare ration method and the consumer Price Index (CPI).

2.6.1.1 The cost of the poverty level of utility

The method is commonly applied in welfare economics. In this aspect, “poverty line can be interpreted as a point on the consumer's expenditure function, giving the minimum cost to a household of attaining a given level of utility at the prevailing prices and for given household characteristics” (Ravallion, 1998). The theory assumes a household x consuming a bundle of goods represented by vector q such that the household utility function can be expressed as $u(x, q)$. The total utility when price p vector is included becomes $e(p, x, u)$. Hence the poverty line can be shown as

$$z = e(p, x, u_z) \dots \dots \dots (1)$$

The poverty level is the minimum of goods a household can afford at given prices and this can be compared in various periods ($t + 1, t + 2 \dots tn$).

2.6.1.2 Cost of living index/ Welfare ration method

The method is related to utility method above. The method money income z to obtain welfare $\frac{y}{z}$, where y is given as $\frac{p}{q}$. The cost-of-living index thus can be written as

$$\frac{e(p, q, r)}{(p^r, x^r, u_z)} \dots \dots \dots (2)$$

(p^r , is the fixed price index

x^r refers to the base of the index of households' demographics

The poverty line here measures poverty against the base poverty line to understand how poverty has changed over time (Blackorby & Donaldson, 1987). Pradhan *et al.* (2001) applied the two measures above for Indonesia and obtained varying results. The cost of poverty level utility indicated that poverty was decreasing whilst cost of living index indicated poverty was increasing.

2.6.1.3 Consumer Price Index (CPI)

The model measures the basket of goods a household given weighted changes in price level. The model is constructed from basic goods for average household for a month.

$$CPI = \frac{\text{Market basket of desired year}}{\text{Market basket base year}} * 100 \dots\dots\dots (3)$$

CPI methods normally used are the Laspeyres and the Paasche indices

2.6.1.3.1 Laspeyres

Formulated as follows:

$$\frac{\sum_{j=1}^n P_{it} q_{ib}}{\sum_{i=1}^n P_{i0} q_{ib}} * 100 \dots\dots\dots (4)$$

Where P_{it} is the price of good i in period t

q_{ib} is the quantity of item i in base year b

Base year prices are represented by P_{i0}

Laspeyres index can be expressed in expenditure form as follows:

$$L_t = \sum_{i=1}^n w_{i0}^H \left(\frac{P_{it}}{P_{i0}} \right) * 100 \dots\dots\dots (6)$$

w_{i0}^H is the average expenditure towards item i from the households sampled H

The method does not allow substitution of goods and services when prices change and is basically an upper bound to the cost-of-living method (Garner *et al.*, 1996: 36)

2.6.1.3.2 Paasche Index

$$P_t = \frac{1}{\sum_{i=1}^n w_{i0}^H \left(\frac{P_{i0}}{P_{it}} \right) * 100} \dots\dots\dots (7)$$

The Paasche is less common as it requires longer time to collect data and normally has lags in data which makes it less attractive for policy use. The method also requires more resources for data collection.

2.6.1.3.3 Fischer's Index

Fischer produced an index which uses both Laspeyres index (L_{t0}) and Paasche index (P_{t0}) and can be shown by superlative indices as follows:

$$F_{it} = (L_{t0})^{\frac{1}{2}} * (P_{t0})^{\frac{1}{2}} \dots\dots\dots (8)$$

Garner *et al.* (1996) performed an experimental consumer price index for the poor in USA using Laspeyres, Paasche and Fischer indices and found different results for the urban population sampled using 136 goods in 1994 using 1984 as the base year (1984=100). The study found the Laspeyres Index was above the income and expenditure of the poor while Paasche indicated that poverty among the poor was below the income of the poor.

Snyder (1961) performed an experimental study using data on expenditure, income and prices for the period from 1936-1955 in the USA. The target population were the low, high- and medium-income households. The aspects of interest were food income elasticity and income. The study found that Laspeyres Index had zero income elasticity for low-income group, moderate income elasticity for high income group and moderate-income group while there were no variations on the income distribution during the period 1936-1955.

Hagemann (1982:494-510) performed an analysis of Laspeyres Index and Paasche index using data from 1960-1961 from household survey conducted by the CE Survey, USA. Study found no statistically significant variations between the poor and the rich households but the results of Paasche indicated that the poor faced higher inflation than the rich but results were highly statistically insignificant (Garner *et al.* 1996). Later, Amber and Stewart (1994) undertook experimental price indices targeting the elderly's expenditure patterns. The results were both statistically insignificant for Laspeyres and Paasche and blamed sampling error in data collection (Garner *et al.* 1996).

2.6.2 Official Poverty Measure (OPM)

The first OPM was developed by Mollie Orshansky, between 1963 and 1964 using food plans and costs from the U.S Department of Agriculture and 1955 Household Food Consumption Survey data and have been in use since. OPM offers consistent and dynamic barometer by which to systematically measure poverty trends over time, countering the weakness of the Council of Economic Advisors (CEA) method as inaccurate and inadequate (Nunes, 2008). Orshansky based her poverty thresholds estimates on 1955 information, in which an average US household spend a third of its income on food hence she multiplied the cost of minimal diet needs by three. However, she adjusted thresholds for family size and composition; and take into consideration yearly inflation rate movements.

OPM method involves aggregating for comparison households "income to a specific dollar value called poverty threshold" (Wimer & Macarthey, 2016) using an "arbitrary absolute poverty line based on food adequacy, chosen family types representative, calculated income and

expenditure relationship and adjustment on farm and no- farm” dwelling (Nunes, 2008). The threshold differs according to household size than geographical variations of the household.

OPM considers only cash income earnings for the household, social security receipts and uses pre-tax income in calculation and excludes all taxes payable, tax credits received and it uses a household of 4 members made of 2 adults and 2 children. In 2014 the USA threshold was at \$24,008 (Wimer & Macarthey 2016). Onshansky methodology was adopted and used significantly by the World Bank until the 1960’s for the bank’s poverty measurement (Nunes, 2008).

OPM uses poverty units and poverty thresholds; Nolan et al. (2016) defines poverty units, as “those who are thought to share resources, as the family (i.e., all individuals in the household related by blood, marriage, or adoption”. Poverty thresholds measure “only on the cost of a minimally adequate or ‘economy’ food budget in 1963 and the relationship between that budget and overall household spending for other necessities around that same time” but has now been adjusted to reflect changes in prices only with other variables and aspects remaining the same” (Wimer & Macarthey, 2016). Unlike the SPM, the OPM does not clearly explain the nature of housing being used by the household. It is rather inaudible on many aspects other than ‘economy food’ and price changes. The OPM is silent on geographical aspects. In real life some geographical areas are more expensive than others hence; poverty threshold is similar for both high-cost and low-cost locations and does not consider safety nets.

The official poverty measure has been labelled flawed as it applies thresholds that are outdated.” It does not put into perspective ‘decent family needs’ and ignores some people in society including “children and those living in college dormitories, institutional group quarters, or military barracks” (Wimer *et al.* 2013). Although OPM thresholds have been updated for inflation, this trend poverty measure still “reflects the living standards, family budgets, and family structures of the 1960s” (Nolan *et al.* 2016:1). The OPM is an incomplete measure of resources” as it does not take into account all the disposable income including all monetary benefits such as grants and near money benefits households receive in the form of nutrition programs and donations (Wimer & Macarthey, 2016). Hence, the OPM is an outdated poverty measure that does not provide real picture of poverty and active roles of both government (poverty policies) and development partners programs in combating poverty (Wimer *et al.* 2013; Bridges & Gesumara, 2015). The poverty trends depicted by the OPM are highly misleading (Wimer *et al.* 2016) as it assumes that public spending on public poverty alleviation has no meaningful impact.

The OPM has been criticised further for being inefficient in identifying the poverty level. Nolan *et al.*, (2016:1) “more than 1 in 5 (21.1%) of US children are poor.¹ But the overall child poverty rate does not accurately convey the extent of disadvantage faced by particular groups of children. The risk for poverty varies starkly by race and ethnicity. Non-Hispanic black children historically have had the highest child poverty rate and remain at elevated risk today, with more than 1 in 3 (37.1%) poor.¹ Latino children are also at elevated risk for poverty, with nearly 1 in 3 (31.9%) poor. In contrast, non-Hispanic white children have a considerably lower poverty rate, at 12.3%.”

2.6.3 Supplementary Poverty Measure (SPM)

Supplementary Poverty Measure (SPM) or the quasi-relative SPM was first used in 2011 by the U.S. Census Bureau and Bureau of Labour Statistics (BLS), as a way of improving the Orshansky measure of 1963- 64 following recommendations from 1995. The USA, National Academy of Sciences (Wimer & Macarthey, 2016; Fox, 2017) took 15 years to refine recommendations and hence adoption of the SPM as a poverty trend measure (Wimer & Macarthey, 2016). The SPM corrects many challenges and criticisms of the OPM; it brings an improved statistical picture of poverty, (Bridges & Gesumara, 2015). The method uses a five-year period.

According to SPM, poverty is lack of economic resources for normal consumption of basic needs; food, clothing, shelter and utilities (FCSU). SPM calculates poverty by making comparison of their financial resources against poverty thresholds that can be quantified into monetary terms. Application of SPM thresholds begins from quantifying spending data for households with exactly two children in their household.

The calculation of family resources for SPM involves the following adding benefits and subtracting expenses as shown below in Figure 2-11:

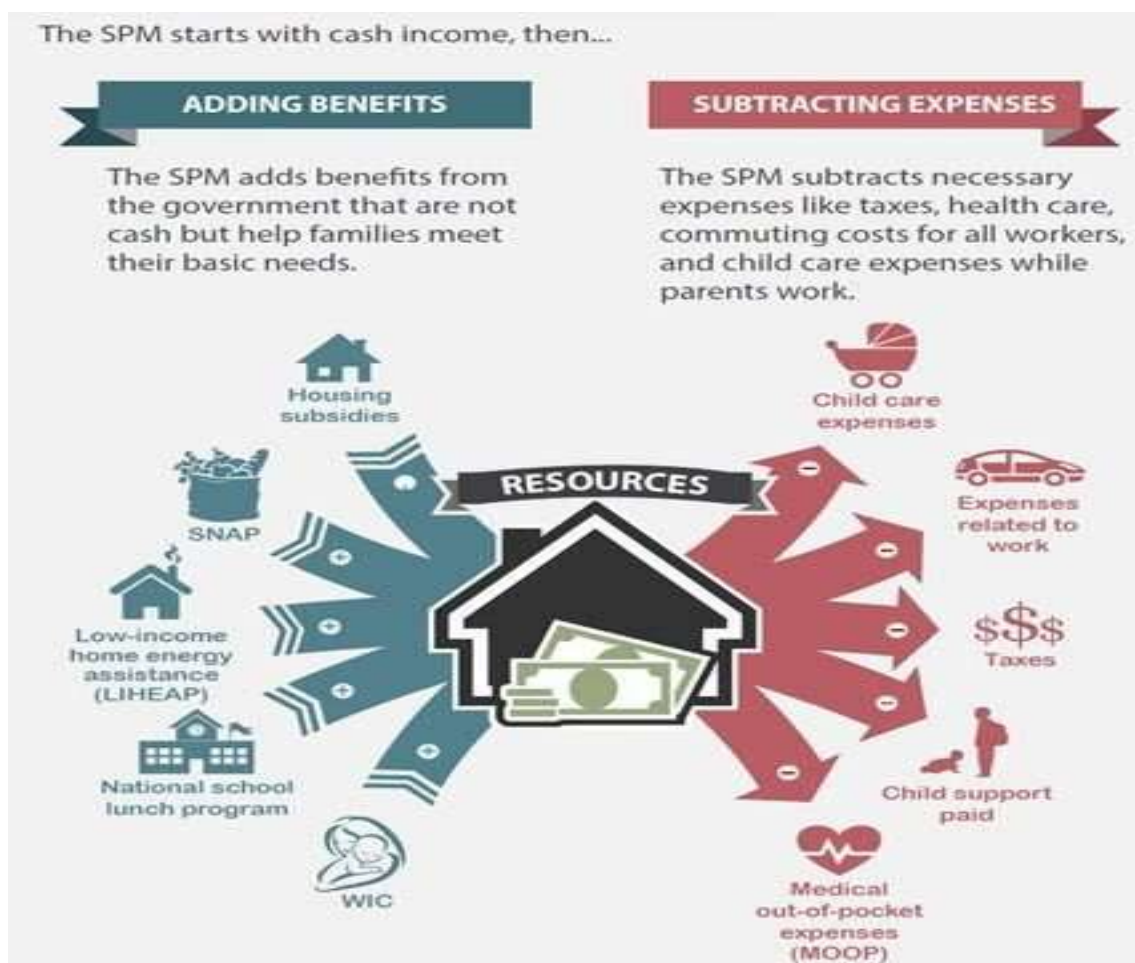


Figure 2-11: Family resources for SPM

Source: U.S. Census Bureau, Current Population Survey (2017)

In addition to family total resources: thus, gross income from both private (salaries and earnings) and public resources the family is receiving, public resources include subsidies in form of food stamps and tax credits.

Subtract out of pocket expenses from family income which include health care insurance core payments, deductible payroll taxes, child support, work expenses and costs on childcare. The SPM is based on family FCSU and small allowable expenses (Short, 2012). This is in Table 2-9:

Table 2-9: SPM Household Resource Estimate

SPM Household Resource Estimate	
SPM Resource = Money income from all sources (private and public income)	
Add (+)	Subtract (-)
Supplementary Nutrition Assistance Program (SNAP)	Federal individual taxes
National School Lunch Program (NSLP)	State individual income taxes
Low Income Home Energy Assistance Program (LIAHEP)	Payroll taxes
Housing subsidies	Child support paid
SNAP for Women, Infants and Children (WIC)	Expenses related to work
Refundable tax credits i.e., Earned Income Tax Credits (EITC)	Medical out of pocket (MOOP) expenses

Source: Short (2013)

The SPM uses a 5-year quarterly family interview data on housing tenure (renting, ownership with mortgage and ownership without mortgage). The items in the FCSU have 30-36% units for an average household with 2 children. The answer is then multiplied by 1.2 to take care of additional basic needs for the household. Finally, the model is adjusted with a three-parameter equivalence scale. According to Fox (2017) the three-parameter equivalence is called is calculated as follows:

1. 1 and 2 adults scale = (adults)^{0.5}
2. Single parents scale = (adults + 0.8*first child+0.5*any child)^{0.7}
3. all other families scale = (adults + 0.5*children)^{0.7}

The geographic adjusted gross rent is an important function in determining average cost. In most cases a 2 bedroomed unit is used based on the median gross rent. Table 2-10 shows example of the SPM calculations that can be used.

Table 2-10: Example of the SPM calculations for US 2007Q2-2012 Q1.

Expenditures		Mean	Standard Error (SE)
Food		\$7,552	\$130
Clothing		\$1,056	\$46
Shelter and utilities	Renters	\$12,781	\$364
	Owners with Mortgage	\$13,360	\$298
	Owners without Mortgage	\$8,495	\$337
Others		\$4,230	\$61

Source: (Garner, 2014)

Although the OPM is still being used in the USA “as a benchmark for program eligibility and remains the official source of poverty statistics for the United States, the supplemental poverty measure is a critical tool for understanding the impact of the social safety net for those struggling to meet basic needs” (Wimer & Macarthey, 2016).

The SPM widens the element of family to include unmarried (cohabiting) couples, other family members and/ or their children (below 15 years) and foster children (below 22 years). Nolan *et al.* (2016) states that SPM also includes “cohabiters and their families in the family unit, assuming these individuals share resources within households” (Wimer & Macarthey, 2016). Due to inclusiveness and more usefulness of the SPM in poverty measurement, it recorded a higher poverty of 16.0 compared to 15.1 for USA for the year 2012 (Wimer, *et al.* 2013) and according to Fox *et al* (2013) as quoted by Wimer *et al.* (2013) that: “overall poverty is slightly higher with SPM than OPM but that government policies have played a more important role in reducing poverty than would be suggested by OPM”.

FCSU for between (30% to 36%) is then multiplied by 1.2 incorporate additional basic needs. For housing thresholds, three housing status groups the following groups are constructed (a) owners with a mortgage (b) owner without a mortgage and (c) renters.

“The shelter and utilities (SU) portion of the FCSU is slightly different for each of these three groups, and it is this SU portion that is subjected to geographic adjustment adjusting them for inflation with the CPI” (Nolan *et al.* 2016). It was further advised by this same researcher that SPM uses geographical adjustments of poverty thresholds. Housing costs vary substantially across geographical locations and this affect the disposable income to acquire other the basic bundle of goods needed by households. Hence, the housing thresholds should be applied according to geographical cost of housing, thus increased in expensive areas and reduced in cheap areas (Nolan *et al.* 2016).

To fully capture the geographical differences, the median rent is standardised for decent two-bedroom unit with decent bathroom and a toilet. The next stage is to compute rental ratio to come up with national geographic adjustment. “The geographic adjustment factor is above 1 when the median rent of a geographic area is above the national average, and below 1 when the median rent of a geographic area is below the national average” and below otherwise (Nolan *et al.*, 2016).

The SPM incorporates all set of resources, such as grants, tax credits including tax rebates, food stamps and other near cash benefits such as school lunch programs, nutrition

supplements, housing assistance, low-income home energy assistance, where we have incomplete consumer expenditure data.

SPM uses three mutually exclusive racial and ethnic groups of children in the case of US which are: non-Hispanic white and black and Latino (Nolan, 2016), and it defines separately people in different housing i.e., renter, owners with mortgage and owners without mortgage.

PSM is “based on updated poverty thresholds, a more modern definition of family structure, and a more comprehensive measure of family resources, including important benefits like in-kind transfers and tax credits not captured in the OPM” Nolan (2016). Use of SPM is hailed because it considers cash income in the form of tax credits, social security, grants, food assistance, and housing assistance less medical out of pocket payments, taxes payable and child support in its definition of resources for family basic needs.

According to Wimer *et al.* (2013), one of the limitations of SPM estimates is that it relies on annual computations of thresholds but some periods have incomplete information. Another limitation is that the SPM methodology applies the same metric the 30-36% consumption expenditures on FCSU food plus 20% on out-of-pocket income. Furthermore, SPM “uses quasi relative threshold that varies over given time as the households’ expenditure patterns for basic basket of goods and services changes” (Wimer *et al.* 2016).

2.6.4 The Anchored SPM

Anchored SPM thresholds “follow exactly the methodology for estimating quasi-relative thresholds” (SPM), changes in consumption are not updated with CE but are held constant and only changes in price of thresholds selected are updated from year to year using the Consumer Price Index (Foster, 2018). Fox (*et al.*, 2015) stated that “anchored SPM arguably provides a cleaner measure of how changes in income and net transfer payments have affected poverty historically”.

Closely related to the SPM is setting a 5-year moving average of an annual expenditure below which a person is defined as poor, and the goods and services applicable included in FSCU for households with exactly 2 children. A small allowance towards non work transport, individual supplies and personal care is provided for. The “threshold is based on expenditures among a population that is not poor, but is somewhat below the median” (Garner *et al.*, 2014). The mean FCSU for the 30-36% of FCSU expenses are then transformed by multiplying it by 1.2 provide for additional basic needs.

It was reported by Wimer *et al.* 2013 that concluded that the anchored SPM and SPM are closely related but historically different. It is a fact that Anchored SPM threshold is steadily higher in the past than the yearly determined SPM threshold (and OPM threshold).

The Anchored SPM Key Assumptions;

1. assumes a definable level of expenditure needed;
2. assumes levels of basic needs remain constant except when price level changes

Anchor a year for example 2007 and 2012 (normally after 5 years) and apply the other thresholds of the SPM. In the case of US, the Anchored SPM uses 2012 as anchor year and like OPM, it changes from year-to-year measures only when inflation changes. In comparison to SPM, relative thresholds are based on actual expenditures or income of a population. These are updated regularly based on changes in consumption or income. Relative thresholds acknowledge that basic necessities change over time with standards of living and technological improvements in a country.

2.6.5 Relative Thresholds SPM

This is based on household disposable income and are easy to use than the SPM and Anchored SPM, (Fox, 2017). The relative measure uses the same FCSU classification of resources, equivalence scales, and geographic adjustments but “relative thresholds are not broken into separate thresholds by housing tenure type.” The housing tenures were eliminated because they vary considerably giving an ‘unbalanced resource distribution presentation’ leaving renters on the bottom of the resource distribution than owners with or without a mortgage (Fox, 2017).

Besides eliminating the housing tenures in the SPM, all the other thresholds remain the same. Table 2-11 is a tabulation for Comparison of thresholds and methodologies of poverty measures.

Table 2-11: Tabulation: Comparison of thresholds and methodologies of poverty measures

Poverty measures thresholds comparison for poverty trends				
Aspect	OPM	Quasi SPM	Anchored SPM	Relative SPM
Measurement units	Family members and immediate family only	Family members, cohabiters, unrelated children and non-cohabiters	definable level of expenditure needed which remain constant except changes in price level	Family members, cohabiters, unrelated children and non-cohabiters
Poverty threshold	Three times the cost of minimum food diet	FCSU	fixed at a given point in time for example a 5-year period	As SPM but less housing tenures
Threshold adjustments	Vary by family size, composition, and age of householder	-Geographical adjustments for differences in housing cost. -tenure adjustments i.e., renters, owners with mortgage and owners without mortgage	Incorporates government antipoverty role and the impact of safety nets on the population	threshold is scaled by a factor of 50%, 60% or 80% and adjusted for family composition and geographic adjustments
Updating thresholds	CPI	5-year moving average of expenditures of 30% to 36% of FCSU times 1.2.	Anchored for in given year and annually adjusted for inflation to reflect only changes in prices rather than changes in household consumption	5- year moving average of expenditures of
Resource measure	Gross income before tax and	All income (private and public) plus cash income and non-cash benefits less taxes paid, less out of pocket medical expenses and less child support expenses	All income (private and public) plus cash income and non-cash benefits less taxes paid, less out of pocket medical expenses and less child support expenses	As SPM but without housing tenures.
Family size		2 adults and 2 children and adjusted (using a specified equivalence scale)	2 adults and 2 children and adjusted (using a specified equivalence scale)	2 adults and 2 children

Researcher's own presentation

The OPM and the SPM produce different results on poverty. Figure 2-12 below shows that for all people, the SPM, reported a 16.1% poverty rate while the OPM reported a 15.1% poverty rate. Generally, SPM poverty rate is lower than the official rate. Presentation in Fig 2-12 highlight that OPM rates are lower than SPM also higher for ages 18-64 years and those aged 65 years or older. The higher report of poverty by the SPM is from various components aggregated together hence this gives a more informed poverty trend than relying on food

poverty measurement in the case of OPM. Figure 2 -12 highlights Official Poverty Measure vs. Supplemental Poverty Measure.

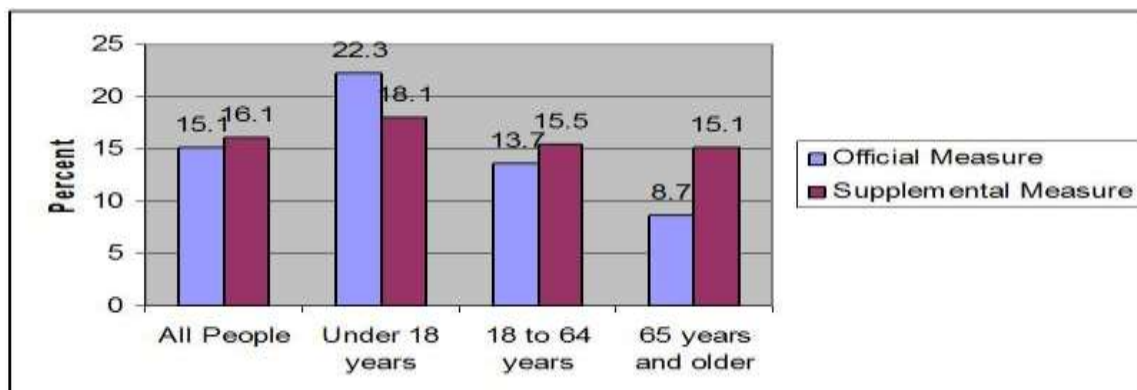


Figure 2-12: Official Poverty Measure vs Supplemental Poverty Measure 2011

Source: Fox (2018)

2.6.6 Comparison of OPM and SPM

OPM only measures food expenditure and the expenditure information which is aggregated to produce the measure is very old (over 50 years). Furthermore, “the threshold levels are fixed in real or inflation-adjusted dollars and do not reflect increases over time in real spending on basic needs” (Bridges & Gesumaria, 2015). To overcome the weakness of the OPM, the SPM construct poverty measure with more thresholds (FCSU) makes the method a more representative poverty one as added variables widen the forms of poverty in households.

Figure 2-13 below shows how significant the additional components are in the economy in fighting poverty. The impact of anti-poverty policies and programmes such as government subsidies, Supplementary Nutrition Assistance Programs (SNAP) and SNAP for women, infants and children (WIC) were enormous in 2010 but never reported by the OPM. They effectively lower the poverty rate (Bridges & Gesumaria, 2015). The effects of SPM poverty alleviation policies are shown in Figure 2-13.

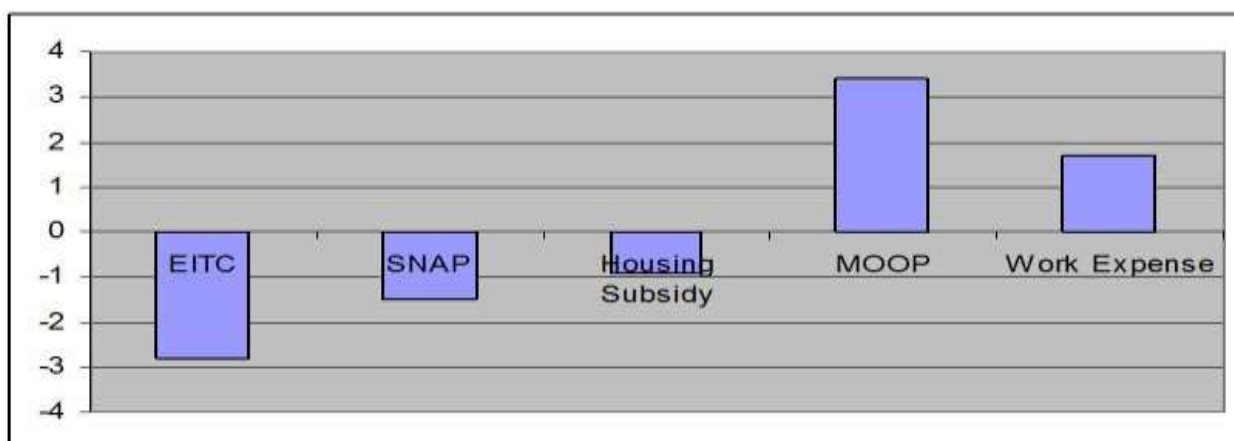


Figure 2-13: Effects of poverty alleviation policies from using SPM for 2010

Source: Fox (2018)

The other weakness of the OPM as compared to SPM is that it does not adjust for geographical differences. The cost of living varies with locations. Locations with higher cost of renting increases poverty rate than places with lower rentals. Assuming that housing is same in all geographical locations is a fallacy, making the poverty measure inaccurate and ineffective. As an improvement and using the Consumer Expenditure (CE), the SPM thresholds are modified to consider variations in “shelter and utility expenditure needs, housing-tenure status consisting units that have owners with mortgages, owners without mortgages, and renters” (Bridges & Gesumaria, 2015). The official family size thresholds and composition adjustments have been criticised, for example, some single-parent families have higher thresholds than married-couple families of the same size, implying that children require more resources than adults in certain size families.

This shows that the “evidence used in setting thresholds for aged units and for one-person non-aged units is quite weak” (Bridges & Gesumaria, 2015). Moreover, the equivalence scales employed by the OPM are implicit and not transparent.

Some of the noted weaknesses of the SPM include elimination of large population of undocumented immigrants in the case of California, US and lack of adjustment on safety nets underreporting. The Relative SPM's weakness lies in the elimination of housing tenures. Although the elimination of tenures removes the issue of starting the renters at the bottom, it is not including the housing aspect and it does not measure their housing cost properly.

A study by Nolen *et al.* (2016) which measured poverty trends in USA children produced different results between OPM and SPM methods between 1970- 2014. OPM poverty was

decreased by 6.3% from 44.4% to 38.1% black children. The trend for Latino children was found to be to have decreased slightly from 33.4% to 31.1%. When SPM method was used it found that poverty rates for both black and Latino children decreased to 28.2% by 2014, white children poverty rates also decreased from 18.0% to 9.6%. The figure below depicts the results between OPM and SPM.

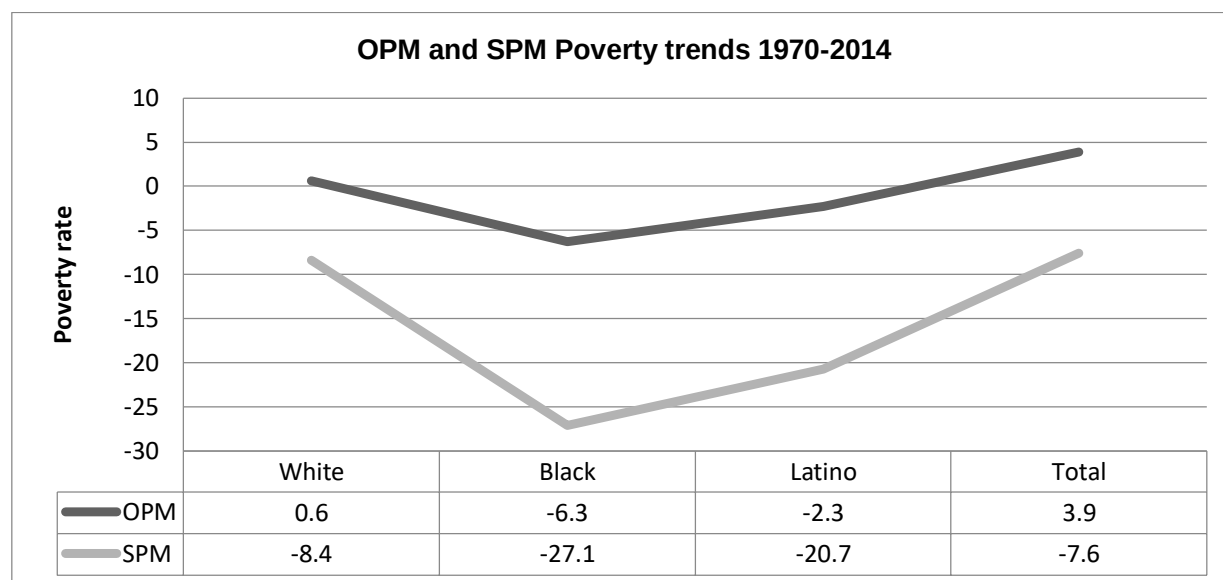


Figure 2-14: OPM and SPM USA poverty trends from 1970-2014

Source: Adapted from Nolen *et al.* (2016)

From Figure 2-14, OPM indicates that poverty was increasing faster when OPM was used than SPM for the period from 1970 to 2014. In a separate study, Nolan *et al.* (2016) used USA data from the Bureau of Labour and Statistics and Bureau of US Census for the period 1967-2008. The data consisted of income and consumer spending. The study used current SPM data adjusted for inflation to develop anchored SPM than recalculated SPM. The demographic variables used included ethnicity, region, family structure and age and it found that when Anchored SPM was used, the median rents for were lower compared to SPM. It was also found that Anchored SPM increased in non-metro areas while SPM results showed no substantial changes.

Studies that compared OPM and SPM have produced different results. Fox (2015) using USA 1967-2012 Consumer expenditure survey data and found that “SPM trends in poverty have been more favourable than the OPM suggests and that government policies have played an important and growing role in reducing poverty - a role that is not evident when the OPM is used to assess poverty” (Fox, 2012).

2.7 CONCLUSION

Various definitions of poverty have been assessed where some are unidimensional whilst others are multidimensional. Since the 17th century, poverty theories have emerged as researchers seek to understand the construct and phenomenon better. The Keynesian, Marxist, Behavioural, Culture of poverty and Classical theories are incomplete in explaining poverty as poverty is multidimensional. The best approach is to bring various theories of poverty together to better understand poverty. Not one single poverty theory explains efficaciously all circumstances of the multidimensionality of poverty. The method of poverty measurement often rests on the definition of poverty being used nonetheless; the most common poverty measures that have been applied in Zimbabwe are income poverty measures. Zimstat has used income concepts to measure poverty for Zimbabwe. Trends of poverty have been applied in developing economies and lag behind in Sub Saharan Africa to the extent that economies such as Zimbabwe do not have poverty trend analysis methods. All the poverty measures are related except for the OPM which only measures poverty trend based on food expenditure. The SPM is the most widely used poverty and the Anchored SPM and the relative SPM improve the robustness of the SPM. The anchored poverty measure uses an anchor year for determination of poverty by holding consumption constant but varying the inflation rate. On the other hand, the relative poverty measure eliminates the use of housing tenure and applies thresholds just like the SPM. In general, the OPM provides higher poverty rates than the SPM. An absolute, or anchored threshold, uses a 5-year base which is then inflation adjusted annually by a measure reflecting only changes in prices rather than changes in household consumption (Fox, 2017). The anchored SPM gives more information on the significance of increasing anti-poverty impact of the safety net, mainly in children and also indicates the effect of safety nets the population subsets.

CHAPTER 3: EMPIRICAL LITERATURE ON MULTIDIMENSIONAL DURATIONAL MEASURES OF POVERTY AND POVERTY PERCEPTIONS

3.1 INTRODUCTION

The concept of multidimensional poverty was initiated in the 1970s, Terleckyj (1970) was one of the first researchers to bring multidimensionality of poverty when he used 20 indicators of monetary and non-monetary poverty measures. These included disabilities and life expectancy into a poverty measure. By mid 1970s, literature on multidimensional poverty had substantially increased (Terleckyj, 1970). Later, Hicks and Streeten (1979) advocated for the use of social and non-monetary indicators in countries using GDP in the basic needs approach and this was later adopted by the ILO in 1979 for use across countries (Kilburn *et al.* 2020). To the best of my understanding and support from literature (Gallardo, 2020), UNDP MPI is the most adopted poverty measure.

This study adopts the UNDP MPI methodology to develop a new multidimensional poverty index for Harare. The work on this chapter initially discusses the UNDP MPI, followed by development of my own MPI framework. This terminates with discussing various multidimensional poverty indices, dimensions and indicators advanced by other studies. Multidimensional poverty measurement is recommended because “human lives are battered and diminished in all kinds of different ways, and the first task...is to acknowledge that deprivations of very different kinds that have to be accommodated within a general overarching framework” (Sen, 2000), to analyse human poverty.

Multidimensional poverty has remained in literature but there is little evidence in studies as to “why people enter poverty as measured using a multidimensional indicator or the effect of individual or structural factors on multidimensional poverty” (Chen *et al.* 2019). Despite this long history of researchers agreeing to the fact that poverty is a multidimensional phenomenon, there remains little evidence on the application of multidimensional concepts in measuring poverty as pointed out by Tomlinson *et al.* (2008:614):

Poverty is an inherently multi-dimensional concept and that reliance on one-dimensional measures can be misleading. However, it has hitherto proved impossible to devise multi-dimensional measures that are stable over time and which can facilitate the precise measurement of trends in the poverty rate, a necessary requirement if the effects of anti-poverty programmes are to be assessed.

Available studies on multidimensional poverty measures include Leipziger & Lewis (1977) who developed monetary and non-monetary constructs in poverty analysis. Morris (1978) propounded the famous Physical Quality of Life Index (PQLI) as a multidimensional poverty measurement which became the backbone to the Human Development Index (Kilburn *et al.*, 2020). Since then, there is no solid discussion of the durational multidimensional poverty measurement.

Multidimensional poverty measurement was further advanced in Bourguignon, (1982) and there have been growing calls for multidimensional poverty measurements across the globe (Battiston *et al.* 2013; Decancq *et al.* 2019). This method utilises many dimensions and indicators to determine poverty. The most used measures include the totally fuzzy, the fuzzy sets produced by Lemmi and Betti (2006): Chiappero and Martinetti (2000), Bourguignon and Chakravarty (BC) (2003) method, Duclos *et al.* (2006) stochastic dominance approach and the OPHI & UNDP MPI (2010, 2018, & 2019). MPI has advantages of being broader than income poverty measurements (Battiston *et al.* 2013). The UNDP MPI is widely used (70%) across the globe and within countries (UNDP, 2019). This study adopts the UNDP MPI to develop a multidimensional poverty measure for Harare province.

3.2 UNDP MULTIDIMENSIONAL POVERTY MEASUREMENT INDEX (MPI)

Multidimensional poverty measures continue to be developed and according to Bandura (2006) the development extends to various topics in line with SDG goals.

Human Development Index (HDI) developed by UN in 1990 gives the background to UNDP MPI. The UN HDI is based on Sen (1985) theory on human capabilities and functioning which put together life expectancy, educational achievement and income into a single composite measure (UNDP, 2010 & Ntsalaze & Ikhude, 2016:198). The HDI was severely criticised for its choice of dimensions and weights (Ravallion, 1997; Ntsalaze & Ikhude, 2016:198). The fall of the HDI led to the establishment of the Human Poverty Index (HPI) by UN in 1997. HPI was a better measure as it introduced both poverty and deprivation in its poverty measure. The HPI dimensions include standards of living, health and education. The HPI categorises HPI-1 (poor countries) and HPI-2 (rich countries). The HPI received global acceptance because of its ability to measure life expectancy (longevity), education and skills and level of standards of living. Nonetheless, the HPI suffered from limited utility and was replaced by Multidimensional Poverty Index (MPI) in 2010.

Oxford Poverty and Human Development Initiative (OPHI) and UNDP (2010) developed a new MPI, (UNDP MPI) which uses health, education and standard of living dimensions and 10 indicators across 104 poor countries. These include countries in Sub Saharan Africa, Latin American and South Asia which have the highest poverty rates. UNDP MPI uses poverty intensity and incidence of poverty across households in a given country. The UNDP MPI enables researchers to determine various deprivations faced by people in a given country (Alkire & Santos, 2010). The method uses dimensional weights of 1/3 on each dimension to form the composite multidimensional poverty measure. The OPHI and UNDP MPI were later advanced in 2014 to 2019 to increase its coverage to 107 countries representing 1,3 billion people but maintained the earlier dimensions and indicators.

UNDP MPI maintained three dimensions from HPI but included 10 indicators and weights of 33.3% for each dimension. UNDP MPI enables global comparison of poverty across regions, countries and within countries by age, race urban or rural using the AF methodology that extends from Foster, Greer and Thorbecke (FGT) MPI is a single index that can be decomposed easily into different dimensions and this offers more flexibility in analysing multidimensional poverty. Ntsalaze and Ikhude (2016) advised that MPI can be used to show change of poverty over time in a singular statistic but unified framework. However, Ravallion (2011) questioned the singular index and proposed use of various dimensions in a dashboard. MPI has been undergoing a series of improvements in 2012, 2016, 2018, 2019 and 2020. The MPI allows incidence (head count) of multidimensional poverty and intensity of poverty (average deprivations) to be decomposed at household, national, regional and international level. Table 3-1 shows UNDP Multidimensional Poverty Index indicators, dimensions and weights determination.

Table 3-1: UNDP Multidimensional Poverty Index

Dimensions	Indicators	Weights
Health (33.3%)	Nutrition	1/6
	Child Mortality	1/6
Education (33.3%)	Years of schooling	1/6
	School attendance	1/6
Standards of Living (33.3%)	Cooking fuel	1/18
	Sanitation	1/18
	Main source drinking water	1/18
	Electricity	1/18
	Housing	1/18
	Assets	1/18

Source: UNDP, 2020

The UNDP MPI is currently used in 107 countries and 1.3 billion people (22%) of World population (UNDP, 2020). The UNDP MPI studies are mainly in Sub Saharan Africa where 84% of multidimensional poverty exists. UNDP MPI uses two categories for age: 5-18 years (61-228 months) and 19-70 years (229-840 months). The measure uses similar weights for indicators within a dimension and different weights across dimensions. Each dimension has weight of 33.3%. The MPI provides a detailed picture of global poverty and it tracks the trajectory towards SDG 1 which is aimed at ending poverty in all its forms by 2030. This MPI also provides governments and other policy makers with information on how to reduce poverty that afflicts half of the world population SDG Target 1.2 (UNDP, 2020).

The UNDP MPI uses AF methodology for its mathematical analysis. It uses headcount (H) or percentage of households who have been deemed poor and the average intensity of poverty (A). UNDP MPI uses similar weights on the same dimensions but indicators' weights change with dimensions (OPHI, 2010).

Various studies adapted UNDP MPI and developed their own poverty measures. According to Alkire (2009), the common steps in creating a poverty measure include purpose of the index, choice of unit of analysis, choice of dimension or indicator variables, choice of poverty line, choice of weights, identification method and aggregation method. Of late, a total of 41 indicators measuring poverty and social exclusion are used to determine multidimensional poverty (DWP, 2006a). The study uses households as unit of identification following the tradition set by Foster & Alkire, (2010); and UNDP, (2014).

Muwonge, & Batana (2014); Bader *et al.* (2016) found that developing own multidimensional poverty factoring monetary and non-monetary dimensions is doable as they found that monetary poverty is weakly correlated with non-monetary poverty dimensions and indicators. Based on this, the study develops a model that uses both monetary and non-monetary dimensions to broaden the dimensions of poverty that people in Harare face.

Development of a multidimensional poverty measure is both technical and political as argued by UNDP:

“The development of a national MPI is both a technical and a political process. Technical teams are needed to design statistics that are rigorous, replicable and robust. Political buy-in at the highest levels of government, often including heads of state, is required to ensure that the measures are implemented both effectively and with an eye towards concrete action. With technical and political support, an MPI can be used to directly address the overlapping deprivations experienced by the poor, resulting in an emphasis on the poorest populations and an acceleration of policies that facilitate their movement out of poverty.”

UNDP and OPHI, 2019:9), argues that support is required across the various facets of the economy for the development of a proper and more representative MPI and to get acceptance by everyone.

Poverty measurement (Tomlinson *et al.* 2008:2) calls for using many dimensions into a single measure. However, according to Mitra *et al.* (2011) there is “no consensus about the most appropriate process in selecting dimensions or setting weights” to use for poverty measurement. The Sen’s Capability approach allows use of both monetary and non-monetary poverty dimensions factored into a single multi-dimensional poverty measure (Sen, 1997; Mitra *et al.* 2011:2). Participatory approach can also be used to develop a multi-dimensional measure as applied by Foster and Alkire (2011). Sen maintained the need to keep the process of choosing dimensions and weights not formally democratic: “It is not so much a question of holding a referendum on the values to be used, but the need to make sure that the weights - or range of weights - used remain open to criticism and chastisement, and nevertheless enjoy reasonable public acceptance” (Sen 1997: 206). The use of both qualitative and quantitative methodologies to construct a poverty measure has the advantage of improving the poverty measurement than when each is used alone (Kanbur, 2003) and Mitra *et al.* (2011).

Stoeffler (2013) applied multidimensional poverty measurement in Zimbabwe in order to understand multidimensional poverty trajectory in the country. The study adopted A-F methodology used by UNDP and applied eight dimensions and 14 indicators. The dimensions

and indicators used were given different weights which were assigned normatively and data variables for rural were differentiated from urban. Data used was collected from Zimstat ICES and PICES from 2001 to 2012. The data were for all ten provinces of Zimbabwe using sample size of 136. Fascinatingly the study found poverty reduction in some indicators throughout the period but households without primary schooling increased during the period and so were households who lack electricity. The study concluded that multidimensional poverty increased for the period 2001 -2007 before it decreased for the period 2008-2012. However, the study results can be challenged as the period was highly unstable in which Zimbabwe recorded highest inflation of over 230 million per cent. Furthermore, the use of different data sets between rural and urban is likely to have affected the results as 56% of sample were rural based.

Zimstat and UNICEF (2019) performed multidimensional poverty measure among children in Zimbabwe. The aim of the study was to determine the level of monetary poverty in children across geographical locations. The study thrust was also to determine how poverty correlates to circumstantial household features and macro-economic conditions obtaining over space and time. The multidimensional poverty also strove to find out how health and education varies in children in poor households. Overall, the study decomposed poverty in children into various components to determine deprivations faced by children. Zimstat and UNICEF study used 2017 PICES to study multidimensional poverty on 30,000 households at national level. The variables used include household consumption (goods produced at household level and market value of household consumption), education, health, child marriage, disability, sanitation, water, house ownership, durable assets owned. The study found child poverty to be 63.1 % (rural 76.3, urban 20%). The poverty gap was found to be 0.384 in contrast to head count poverty 63.1%. Households with non-educated households had the highest child poverty (84%). Health was a serious determinant of poverty. Most children in poor health were found to be in poverty so was child marriage that was very high in households with child poverty.

In a separate study, Musiwa (2019) conducted a multidimensional poverty in children 5 years and below in Zimbabwe and obtained different results. The study aimed at investigating the extent of child poverty, the poverty risk patterns and policy implications. The study used sample size of 6,418. The data were collected from Demographics and Health Survey for 2015. Fourteen deprivation indicators were used and Bristol Approach was employed to perform the investigations of child poverty. The study concluded that 78% were severely deprived in early education, 46% lacked water, 44% had poor health, 40% suffered poor sanitation, 30% were deprived in housing and 13% suffered nutrition deprivation. The study findings were different

from those by Zimstat and UNICEF who reported overall 84% education poverty and 67% health poverty.

Wagle (2009) adapted UNDP MPI and used two multidimensional poverty measures to estimate how economic wellbeing and social exclusion dimensions apply to poverty measurement. The study used panel data from surveys made from US and Nepal. The study reported mixed correlations between dimensions. Furthermore, the study found that the incidence of multidimensional poverty and absolute poverty are related while in the US multidimensional poverty was higher than absolute poverty constructed from income.

Mahembe and Odhiambo (2019) undertook a multidimensional poverty analysis to investigate the effects of foreign aid on poverty. The researchers used both monetary and non-monetary dimensions and indicators from various countries that reported on foreign aid for their study. Mahembe and Odhiambo (2019) applied empirical literature review on both non-monetary and monetary dimensions. Some of the dimensions used included income, GNP, education, education, infant mortality, democracy, aid, and GDP (Mahembe & Odhiambo, 2019:3). The study concluded foreign aid significantly reduces multidimensional poverty even though democracy was found to be a strong pillar that enhances foreign aid. The study reported limited studies on foreign aid as a factor that hindered their research.

Alkire (2009) developed the Human Development Index made of three dimensions: health economic deprivation and education. The HPI is made up of two pillars which are HPI-1 (poor countries) and HPI-11 (for rich countries). The thresholds of HPI-1 and HPI-11 differ as PHI consist of social exclusion which is absent in HPI-1. In general, the HPI is the arithmetic mean and it applies cut offs. The HPI-1 was applied for Angola where 33.2% of the population has adult literacy, indicating higher educational poverty. The study also found that 50% of children were underweight. The HPI was preferred as it was found to be less rigorous in calculations and further investigation using more than 3 dimensions.

Asselin (2009) performed multidimensional poverty measure using UNDP HPI for Senegal and Vietnam through panel data collected from household surveys. The study found that Senegal had a multidimensional poverty of 60% and income poverty of 48%. It was concluded that income poverty measure is inaccurate as has the poverty is beyond income and should be measured as such. For Vietnam the study found income poverty of (-27%) and multidimensional poverty of (-30%) hence, the study produced conflicting results. The results from Senegal depicted a positive relationship between income poverty and multidimensional poverty whilst the

Vietnam results depicted a negative one between income and multidimensional poverty measures.

Sahn and Stifel (2000) adapted and used the dimensions from HDI which are also part of UNDP MPI for surveys of DHS from 15 Sub-Sahara countries to measure poverty. The study used factor analysis (FA) to estimate asset index of households sampled. However, most studies use MPI methodology to estimate poverty due to its composite nature and easy decomposability.

Ntsalaze and Ikhude (2016) used multiple correspondence analyses (MCA) for multidimensional poverty measurement for South Africa. The study used the UNDP MPI dimensions and indicators and added economic assistance to make 4 dimensions. MCA has the advantage of determining interrelationships between variables (Greenacre, 2007). The study found that multidimensional poverty was more rampant in rural and township locations than urban areas. However, further studies are needed to determine poverty in urban areas using these additional indicators.

Decancq *et al.* (2019) adapted and developed a new multidimensional poverty measure for Russia using panel data set from survey for the period 1995-2005. The study employed numerous dimensions of poverty as well as individual preferences to measure poverty across dimensions and individuals. The axiomatic approach was used to ascertain multidimensional poverty and inter preferences to generate two unique families of poverty indices. Econometric life satisfaction model was used to measure happiness. The study produced a McFaden Pseudo R^2 of 0.073 from the logistic regression model which is statistically comparable to other studies on multidimensional poverty measurement such as Graham *et al.* (2004); (Decancq *et al.* 2019:41). The study found that education was the main multidimensional driver of poverty. The results differed with other findings which found health as the most significant driver of poverty.

Deutsch and Silber (2005) measured multidimensional poverty for Israeli using logit regression Census data. The study compared 4 multidimensional poverty approaches which are: information theory; efficiency analysis; fuzzy sets and axiomatic deprivations poverty. The analysis concluded that poverty decreases with the level of education and it was found that households whose head has above basic education are less susceptible to poverty. Poverty was higher in families who recently migrated. Secondly, single households are more prone to poverty compared to households with both parents. The study concluded that multidimensional poverty and income or expenditure poverty measurements were insignificantly different. Income poverty was found to represent multidimensional poverty accurately. The above findings differed

from Asselin (2009) who found that monetary poverty was insignificant in explaining multidimensional poverty.

Steinert *et al.* (2016) undertook multidimensional poverty measure for South Africa, KwaZulu Natal province focusing on peri-urban and rural communities of the province. Data were collected through stratified and random sampling. Questionnaires were administered physically, targeting 10–17-year-olds and adults. The dimensions used included housing quality, ownership of assets and human capital. The study applied equal weight across dimensions and indicators. Scree plots and Eigenvalues were performed to assess data variability. The study found that there were “substantial variations in the meaning and conceptualisation of poverty among urban and rural respondents, a considerable number of poverty items such as household overcrowding, transportation, or employment could distinguish adequately between poorer and wealthier households in one area, but were found to have little relevance to socioeconomic status in the other area. In addition, the analysis found indication of ‘clumping’ effects in the distribution of observed poverty levels - pointing to different patterns of asset ownership and housing quality in urban and rural populations” (Steinert *et al.* 2016). The study findings did not capture the quality and functionality of assets it recorded hence some could have been obsolete. In addition, the study did not attempt intra household inequality and in their own admissions, “further refinement may be required in order to identify whether these indices can serve as an adequate measurement tool for identifying the poorest and most deprived households, both within and across countries”, (Steinert *et al.* 2016).

Hjelm *et al.* (2016) compared UNICEF Multiple Overlapping Deprivation Analysis (MODA) to MPI in child poverty across four countries Cambodia, Ghana Mali, and Mongolia and sample sizes of 10,500 using 15,667, 11,925 and 13,995 respectively. The data were collected from household surveys. The study used 9 dimensions which are education, information, nutrition, health, water, sanitation, housing assets and violence. Table 3-2 depicts selected Countries Multiple Overlapping Deprivation Analysis.

Table 3-2: Selected Countries Multiple Overlapping Deprivation Analysis

Country	MPI	MODA	MODA poor, MPI non poor	MPI poor, MODA nor poor	MODA poor, MPI poor
Cambodia	49	66.7	24.1	6.4	42.6
Ghana	35.3	62.7	32.5	5.2	30.2
Mali	74.4	67.0	7.5	14.9	59.5
Mongolia	12.4	30.9	23.4	4.9	7.5

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province

Source: Hjelm *et al.* (2016)

The study found significant overlaps between MPI and MODA, indicating serious reservations on the models. For example, in Cambodia 24.1% were MODA poor while 6.4% were MPI poor and the people found to be MODA poor and MPI poor were 42.6. In general, MPI indicated lower poverty measure when compared to MODA. The study concluded that MODA and MPI do not give similar policy intervention advice but offer a comparable tool to measure poverty across different locations.

de Milliano and Pravgo (2019) studied MODA in child poverty using dimensions from the Convention on the Rights of the Child for the whole of Sub-Saharan Africa through data from DHS and MICS. The study concluded that sanitation (67%) was the most deprived dimension and the overall poverty was 64% or 291 million children. However, the study reported serious data gaps in some dimensions and this affected results.

Nasri and Belhadj (2017) adopted and developed a separate multidimensional poverty measure in Tunisia using national consumption survey data of 2010 from National Statistics Institute of Tunisia (INS). The study stratified the country into two geographical locations which are large municipalities and small and medium towns with sample size 13,392 randomly drawn across Tunisia. The study concentrated on multidimensional aspects of households' access to health and education (community services); expenses incurred by households in acquisition of assets, food and nutrition. Data on demographic, socioeconomic and geographical aspects were collected but excluded dimensions that do not measure hardships in people. Poverty was defined as someone excluded in at least three dimensions. Head count and poverty gap were used to measure poverty and Alkire-Foster method in poverty measurement. The study concluded that people residing in rural areas are, on average, the poorest while people in cities such as Central East, Central West and South East had low poverty indices of 19%, 35% and 29.3% respectively. Health poverty was the main form of poverty in Tunisia with a national average of 45.96% deprivation count. In Central West, 70% of households were education poor whilst in the North West region 61.7% were deprived in either education or any one of the other dimensions. The results indicate mixed findings and did not include poverty from hardships.

Another study by Alkire *et al.* (2015) adapted and developed a new MPI using a chronological approach to poverty measurement. First the study used unidimensional poverty and identified the poor from the population using a poverty line. Secondly, the study aggregated the poor Foster, Greer and Thorbecke (FGT) poverty aversion parameter methodology and income indices such as poverty line, normalised poverty gap, squared poverty gap and head count.

Matrices and vector operations (deprivation matrices) were used to measure multidimensional poverty, firstly by identifying dimensional cut offs. Households were defined poor if they were below the deprivation cut off set. The method used weighted deprivation count. The identification of the poor for multidimensional poverty was based on multiple deprivations across dimensions of a given household. The matrix and vector operations produced generalised mean of order for arithmetic mean, geometric mean, harmonic mean and “admissible mathematical transformations” Alkire *et al.* (2015:24). The findings from unidimensional poverty measure first used in this study were not systematic to the findings from multidimensional poverty measure.

Khan *et al.* (2011) adapted the UNDP MPI to measure multidimensional poverty in Pakistan. The data were collected from Federal Bureau of Statistics, testing poverty across 4 dimensions which are income (H1), education (H2), health (H3) and housing services (H4) across 11 sub dimensions. Head count, adjusted head count ratio, adjusted poverty gap was estimated from the logistic models across the 4 provinces rural and urban areas of Punjab, Sindh, KPK and Balochistan. The study found that poverty decreased in period 1998-1999, 43.34% to 38.31% in period 2007-2008. The biggest reduction in poverty was reported in rural areas and generally poverty decreased over the 10-year period. These findings are challengeable as rural poverty has been found to be higher and increasing in other studies.

D'Ambrosioa (2011) used European Community household data to determine multidimensional poverty across 5 countries which are Belgium, France, Germany, Italy and Spain across 7 multidimensional indicators. The indicators were income, financial status, accommodation type and quality, durable assets owned, health, social relation and satisfaction. To reduce multicollinearity among indicators, the study assumed that 25% of the households are poor. A logit regression model was used to perform data analysis and households were coded poor (1) or otherwise (0) non-poor. The study concluded that there is a cup shaped relationship between household size and poverty. These findings are not in sync with results from other studies.

Work Bank (2017) undertook a multidimensional poverty measure for Philippines using indicators and dimensions guided by empirical literature as well as data accessibility and availability for the study period 2004, 2007, 2008, 2010, 2011, 2013 (World Bank 2017:5). The study benchmark was the UNDP MPI. The study adopted the three dimensions of UNDP which are health, education and standard of living but used different indicators in some cases. Indicators for education were the same with UNDP but health indicators were illness and food consumption. Standards of living included assets, employment, roof- wall, sanitation, electricity and water. The study applied uniform and nested weights, inverse incidence weights, normative

welfare weights and Balisacan weights as proposed by Balisacan (2015) across indicators as follows: health indicators (1/3), education (1/6) and standards of living (1/18). The poor were identified by cross sectional cut offs. The study found that there was a decline in multidimensional poverty in respect to education and standards of living indicators. Standards of living indicators such as water and sanitation showed little progress during the entire period. Health indicators results showed mixed findings on the indicators. Illness was declining but food nutrition and consumption showed no change during the period. The largest poverty decline was recorded by welfare weights and this supported the previous findings by Balisacan (2015) that multidimensional poverty was decreasing driven mostly by non-monetary dimensions. The study, however, did not have full data for 2013 on health hence time series comparison with prior years was impossible. Furthermore, the study recommended more research on multidimensional poverty and income trends factoring other dimensions into the poverty measure.

Beduk (2016) performed material deprivation indices (MDI) on unmet health care needs due to inadequate resources. The study used 2009 EU survey data on 27 EU countries which excluded Norway and Iceland. Household Reference Person (HRP) data such as clothes, and social activities, health, disability, chronic health care challenges, EU formal poverty measure, bad health, relative income poverty, employment (joblessness) and income inadequacy were used. Logit model concluded that 90% were not in severe deprivation. The study conclusions are incomplete and challengeable given the assumption made in the study that poverty is disability. Also, the study excluded many dimensions and its use of relative income poverty is not a good measure of income poverty.

In a separate study, Adepoju (2018) carried out a multidimensional poverty analysis in which the study focused on determinants of multidimensional poverty in rural Nigeria households. A total of 2 746 rural households made the sample size for the study. The five dimensions are: Housing (floor type 1/25, wall type 1/25, roof type 1/25, cooking energy 1/25 and lighting energy 1/25), Sanitation (nature of toilet 1/10 and water source 1/10), education (school attendance 1/10 and household head school achievement 1/10), health (any reported illness 1/10, activities disrupted by illness 1/10) and lastly assets (land ownership 1/10 and assets owned by household 1/10). The dimensions were of similar weights of 1/5. AF methodology and logistic regression were performed to analyse data. The multinomial logistic regression results showed an increase in poverty among female headed households and households with heads between 61-90 years. The findings are in line with earlier studies by Adeoti (2014) who also found multidimensional poverty to be increasing. However, when multidimensional poverty was compared over time, the

study found that poverty was actually increasing from k=1 to k=5. The study found most rural people face chronic poverty (47%), transient poverty (23%) and non-multidimensional poor (30.5%). The poverty gap was used to derive multidimensional poverty and is difficult to use for non-monetary dimensions hence the limitations evident in this study.

Goli *et al.* (2019) undertook regional multidimensional poverty measure to determine inequality in Nepal. The study used demographic health survey data obtained in 2011 using new procedures and better aggregation of indicators (Goli *et al.* 2019). It targeted 16 795 households (12 674 women and 4 121 men) and 10 826 questionnaires were successfully completed for the entire 15 regions (12 Eco development regions and 3 ecological regions). The study used three dimensions adopted and modified from UNDP and these are health (2 indicators), education (4 indicators) and standards of living (30 indicators). The study used geometric mean (GM) for estimating multidimensional poverty, “because GM makes sure that a low achievement in one dimension is not linearly compensated by high achievement in another dimension. The GM reduces the level of substitutability between dimensions and at the same time ensures that 1% decline in the index, say, life expectancy at birth has the same impact on the MPI as 1% decline in education or income index” (Goli *et al.* 2019:7). The GM model used is shown as:

$$MPI = (EPI * HPI * SCPI)^{1/3}$$

where:

MPI is the multidimensional poverty measure being estimated;

EPI is the educational poverty index;

HPI is the health poverty index;

SCPI is the standards of living poverty index.

The study found huge urban-rural poverty as 54.4% people in rural areas were education poor as compared to 32.2% in urban areas. Terai region was determined to have the biggest number of school-going age unenrolled (10.63%). The study concluded that the highest multidimensional poverty was in mid-western region (0.262) and far western region (0.242) while western region had the smallest incidence of poverty (0.188). The findings have been challenged. Arithmetic mean was applied and it produced 31.1% multidimensional poverty compared to 30.39% of geometric mean. Arithmetic mean was found to be a better measure

than GM which was applied by Goli *et al.* (2019) as it produced identical results to Nepal Human Poverty estimates.

Alkire and Feng (2019) studied China's multidimensional poverty using survey panel data collected by China Health and Nutrition. A total of 10 indicators and three dimensions of health, nutrition and education were used to measure deprivation, however, households with missing or incomplete data were eliminated. Equal weights of 33.33% were used for the dimensions. Panel logit model was used to perform data analysis, establishing rural and urban areas had significant decline in poverty whilst regions such as Shandong and Henan had the lowest poverty ratios. Hubei had the biggest poverty decrease for the period reviewed. Poverty decreased with age while households headed by females had lower probability of being poor compared to Balisacan weights. However, divorced or widowed households had higher chances of poverty count. Education was found to enormously reduce poverty.

Alkire and Apablaza (2016) adopted the AF model of UNDP and developed a new MPI for European Union (EU). The study used five dimensions and twelve indicators as shown below:

Table 3-3: European Union (EU) MPI

Dimension	Indicators	Weights
Income	Household level of income	1/6
Formal employment	Unemployed	1/6
Standards of living	Material deprivation	1/6
Education	Primary level	1/6
Environment	Pollution	1/24
	Crime	1/24
	Noise	1/24
	Housing	1/24
Health	Severe health crisis	1/24
	Normal health care	1/24
	Health affordability	1/24
	Morbidity	1/24

Source: Alkire and Apablaza (2016)

The EU study by Alkire and Apablaza above was for period 2006-2012 and it was concluded that multidimensional poverty and head count were both decreasing over the period while intensity of poverty was between 47% and 48% for the entire period. Income, standards of living and employment poverty dimensions exhibited increase in poverty whilst education and environment showed biggest decrease in poverty between the periods. The study findings were

for Europe, but did not include nine European countries which include Iceland, Belgium among others. These results were imposed on all European countries without actual study on every country. Furthermore, the study used less dimensions and indicators for poverty and this necessitated further studies later in 2013 on the same countries factoring the additional dimensions and indicators of overcrowding, vocational training, disability, activity and heating. Activity dimension measured variables such as friendship, cinema visits and interaction with extended families. Despite this improvement, the measure was recommended by UNDP (2016) to include indebtedness and other new dimensions to facilitate full understanding of poverty in Europe.

Santos and Villatoro (2019) adopted AF model being used by UNDP to develop own MPI for Latin America (MPI-LA) for seventeen countries and two regions for 2005 and 2012. The model was made up of five dimensions and ten indicators. Housing had indicators such as overcrowding, ownership and tenure, house materials. Basic services had indicators such as energy sources, water sources and home sanitation. The third dimension was living standards which had indicators such as durable goods in the household and monetary goods owned by the household. The fourth dimension was employment and social services which had indicators such as employment, insurance and pension. The choice for dimensions and indicators used was based on international conventions and unsatisfied basic needs (UBN). Various weights and cut offs were used and factor analysis (FA) was used to run the MPI model. The study concluded that there was weak multidimensional poverty in Latin America. The researchers indicated that the results were insufficient in explaining poverty in the two regions “with the MPI-LA being a regional index, the heterogeneity across countries in terms of phases of development may require making some compromises in the choice and definition of indicators, so that these are applicable to the whole set of countries” (Santos & Villatoro, 2019). Further critique by Najera and Gordon (2019) shows that the selection of the dimensions and indicators used by Santos and Villatoro is liable to distortions. Najera and Gordon further contested the validity test of the dimensions used and the hierarchical model that was imposed by the MPI-LA using (FA) without statistical validation and robustness tests of the indicators (Santos & Villatoro, 2019) as recommended by World Bank (2017).

Ajirapa *et al.* (2020) undertook a quantitative poverty analysis in Khon Kaen province, Thailand. By adopting UNDP MPI methodology and including minimum basic needs (MBN), the study was done on 187 households from three: Khok Po Chai (72), Sam Sung (52), and Nam Pong (63). The study used seven dimensions which are health, Thai values, economy, education, environment, assets, empowerment and digital proficiency. A total of 41 indicators were used

and linear logistic regression was employed to analyse the results. The study found that income had a strong influence on most dimensions and poverty was statistically decreasing. However, the study could not ascertain the relationship between poverty and religion.

Egger *et al.* (2020) developed a new multidimensional poverty measure for Mozambique using AF methodology of UNDP MPI for period 2009 to 2018. The study made small variations to indicators (health and education). The “selection of indicators was based on the existing literature on multidimensional poverty assessment and on the availability of well-being indicators in the four surveys but not all indicators were available.” (Egger *et al.* (2020:5). The study used one dimension (standard of living) and 6 indicators which are: cooking energy (deprived if using dung, shrubs, agricultural crop, wood, charcoal or coal, sanitation (nature of toilet system and whether its shared), source of drinking water (at least 30minutes distance to water source), electricity (source of energy), housing (floor, roof and wall type) and assets (radio, television sets, telephone, computer, animal drawn carts, bike, car, truck or fridge). All the indicators had 1/6 weights and the cut off was set at 40% meaning a household was defined poor if it was deprived of three or more of the indicators. The study employed First Order Dominance (FOD) technique. FOD poverty data from various areas is collected by small census survey on household features and consumption and this can inform whether one area is better than the other (Arndt, 2015). Results showed that rural people are more deprived than urban people and the poverty gap between urban and rural was increasing from 2015 to 2018. Although the study found urban poverty to be better than rural poverty, urban poverty was actually deteriorating for the period 2009 -2018. The study hence concluded that poverty was increasing in the whole country. It increased from 21 million to 22.2 million for the period 2015 to 2018. Egger *et al.* (2020) however admitted that their study could not establish causal linkages in the indicators on Mozambique experienced a series of negative shocks including “economic crisis, hidden debt scandal, natural disasters, and armed attacks in Cabo Delgado” and recently COVID-19 which all had an effect on poverty in Mozambique. Lastly use of FOD cannot be 100% relied upon as earlier studies found it misleading and the following are its main challenges.

1. “FOD comparisons can be indeterminate. If neither A dominates B nor B dominates A (e.g., both linear programmes are infeasible), then the welfare rankings of A and B are indeterminate without further information;
2. While A may dominate B, the degree of domination is unknown without further information. Dominance may therefore reflect both fine differences in the distributions

across states or may reflect substantially different circumstances between A and B". Hence there need for further investigations into Mozambique poverty (Arndt, 2015).

Klasen & Villalobos (2020) studied multidimensional and income poverty in Chile for the period 1992, 1994, 1996, 1998, 2000, 2003, 2006, 2009, 2011, 2013, 2015 and 2017 covering the whole country population in rural and urban areas. The study dimensions used are school attendance, schooling gap, adult schooling achievement, insurance, nutrition, access, employment, pension contribution, pension or retirement income, overcrowding, housing materials, basic needs (drinking water and sewage) on 13 regions representing both rural and urban areas. The logistic regression results showed that decrease in household sizes decreased poverty from 1992 to 2017.

Maity (2018) used primary data obtained through survey from 660 households of Bodo area which covered 22 villages from 4 districts of Baksa, Chirang, Kokrajhar and Udalguri with total 3.2 million people over an area of almost 10 000 square kilometres. Multiple Correspondence Analysis (MCA) was used to map the MPI. The study used a two step-wise logistic regression to identify factors that determine multidimensional poverty. The study aggregated individual deprivations faced by people at individual level and used MCA to analyse the variables such that households deprived of a factor were given 1, otherwise 0 for non-deprivation. The variables used for the study were family size (X1), education status (X2), number of household members employed in the age group (15-59 years (X3), annual household consumption in Rupees (X4), operational land holding (X5) and distance from main town (X6). The study average family size was 6 while the maximum and minimum family sizes were 11 and 1 individuals respectively. The study concluded that health and literacy rate were the most notable influencers of poverty in the Bodo area. All the households in the 24 villages were moderately poor. Education and number of household members employed were found to positively affect poverty.

Oshio & Kan (2014) used household data for 24,905 households in Japan obtained from "Comprehensive Survey of the Living Conditions of People on Health and Welfare (CSLCPHW), which was conducted and released by the Ministry of Health, Labor and Welfare (MHLW) of the Japanese Government in 2010" (Oshio & Kan, 2014). The study measured multidimensional poverty using 4 income dimensions which included housing, social amenities and protection, income and housing; three health factors which are self-rated health (SRH), psychological distress and current smoking. The study applied random sampling to collect data from 35,971 household samples using a questionnaire from 2,000 districts. The household response rate

was 75.7% from the sample limit between 20-59 household heads or their spouses. Logistic regression was used to perform analysis of the data. The weights and poverty cut offs were set using Alkire and Foster methodology. The study concluded that a multidimensional poverty measure was more appropriate for poverty measurement. There were 32 types of multidimensional poverty measures and 4 unidimensional poverty measures. However, the model failed to indicate the most appropriate dimension of multidimensional poverty.

Bader et al (2016) compared income and multidimensional poverty for Lao People's Democratic Republic using 2008-2009 household secondary data Lao Consumption and Expenditure Surveys (LECS), primary data obtained from Lao surveys Statistics Bureau in 2013. A total of 8,376 households and 48,021 individuals participated in the survey. The independent variables included nutrition, demographic variables, health, education, employment status, physical household features, social factors and material wellbeing. The study used multinomial regression to measure poverty across subgroups. Multinomial regression was also employed to assess poverty drivers. The MPI followed Alkire and Foster (2011) methodology regarding the weights and cut offs. The study found mutually exclusive clusters of households: poor in monetary and not in multidimensional poverty, poor in multidimensional but not in monetary, poor in both monetary and multidimensional poverty and lastly non-poor. The study found that 50% of households faced multidimensional poverty in terms of weighted indicators, that incidence of poverty and poverty composition from the population varied depending with the dimensions. National poverty was at 28% whilst multidimensional poverty was at 35%.

Fonta *et al.* (2020) studied multidimensional children poverty using 722 households in Burkina Faso. Alkire and Foster methodology was used to measure poverty in children between 5-18 years using 7 dimensions. A binary logistic regression model found that the highest poverty was in water and sanitation dimension (91%), information (89%) and education (83%). It was also determined that 97% of children are deprived in at least 3 of the 7 dimensions. Child poverty was negatively related to educated mother but positively related to rural areas. Nonetheless, the study could not establish the relationship among the chosen dimensions.

Azeem *et al.* (2018) used a probit model to estimate household vulnerability to poverty in Pakistan from a data set of 90,000 households from Punjab province on three explanatory variables: health, education and standards of living. The study used weights of 33.3% and cut off points to exclude non-poor. For estimation of head count poverty, the Haughton & Khandker (2009) methodology and Chaudhuri *et al.* (2002) method was used to assess vulnerability to multidimensional poverty. The study concluded that 37% of households were monetary poor,

39% multidimensional poor, 56%vulnerable to monetary poverty and 58% vulnerable to multidimensional poverty. The study findings differed from prior studies (Carzhen, 2010) but failed to conclude on whether all households were vulnerable to all multidimensional poverty measures. The probit measure produced varying coefficients across the 4 dimensions used indicating choice of poverty measure method used gives different policy implications.

Alem and Demele (2020) estimated the probability of being energy poor using probit model for Ethiopia. The research used panel data from Ethiopian Urban Socioeconomic Surveys (EUSS) collected for the periods 2000, 2004 and 2009 from seven cities including Addis Ababa and Awassa. The study strove to determine poverty trends and persistence of poverty and found that a household that was poor was 16% likely to be poor in subsequent periods.

In Zimbabwe, there is no evidence of another multidimensional poverty measure besides the UN MPI measure and Quentin *et al.* (2016). The study by Quentin *et al.* (2016) found multidimensional poverty to be increasing when Alkire and Foster (AF) methodology was used for the period between 2001-2012. The dimensions used in the study indicated different trends of multidimensional poverty.

Although in general Multidimensional Poverty Index has faced serious criticism from Ravallion (2011); Greco *et al.* (2019); Biggeri *et al.* (2019), the international world has remained largely in support of it (Kilburn *et al.* 2020). The UN SDG gives emphasis to multidimensional poverty in its target 1.2, “eradication of poverty in all its dimensions”, (UN, 2020) while the World Bank, through the Atkinson Commission, encourages continuous development of the MPI. The current study therefore adds to the growing applicability and efficacy of multidimensional poverty.

Various countries have undertaken development of local multidimensional poverty measurement for various reasons. Below are some of the countries that adapted UNDP MPI and developed their own MPIs for reasons indicated. Table 3-4 is a country specific MPI.

Table 3-4: Country specific MPI developed and its purpose

Country	Purpose for new MPI developed
Andhra Pradesh	To appreciate all forms of deprivations encountered by citizens, across locations and social, political and economic classes in order to reduce deprivations and multidimensional poverty.
Armenia	To support monetary poverty measures.
Bhutan	To develop, monitor and evaluate regional and national programs aimed at poverty reduction.
Ecuador	MPI was designed to trail poverty trajectory

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Country	Purpose for new MPI developed
Mozambique	To assist money metric measures and to track poverty.
Nigeria	To comprehend the most important poverty dimensions.
Nepal	To facilitate measurement of SDGs progress.
Pakistan	To facilitate tracking of social development policies
Vietnam	To ascertain beneficiaries of anti-poverty programs, to rank social policies in order of importance and to guide government on the right social policies to pursue.

Source: UNDP, OPHI & Oxford University, 2019:21-22

Ravallion (1996:8) proposed a set of six variables to be included in a viable multidimensional poverty measure and these are:

1. A functional measure pinned on the distribution of real expenditure on goods and services from the market;
2. Value determination of non-market goods in the measurement;
3. Application of gender disparities and infant nutritional status in constructing a poverty measure and;
4. Determinants of disability personal features and chronic undernutrition experiences.

The UNDP MPI faces challenges as it does not provide a full approach to poverty measurement because it is “deeply constrained by data limitations” (Alkire *et al.* 2010:6) The use of three dimensions to define all forms of poverty results in underestimation of the depth of poverty people face. Gerlitz *et al.* (2015:278-279) concluded that UNDP MPI does not apply to all societies. Its dimensions and indicators are not suitable to the mountain-specific 8 countries across the Hindu Kush-Himalayas - Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan. These mountain regions need their own exclusive approach if policy makers and development partners are to reduce unique and highly heterogeneous poverty they face. It is now noted that as result of the failure of UNDP MPI measure, the Hindu Kush-Himalayas developed their own MPI for the Hindu Kush-Himalayas (MPM-HKH) which is made up of mountain specific 7 dimensions and 16 indicators (Gerlitz *et al.* (2015:286). Furthermore, the UNDP MPI fails to address the notions expounded in 2005 by Wagle that poverty measurement ought to “link poverty with the broader concepts of freedom and human rights, the capability approach suggests that poverty and well-being are functions of capabilities” (Wagle, 2005). UNDP defined poverty in the form of capabilities (UNDP, 2000a) but its measure does not include that aspect. Poverty dimensions and indicators should consist of wider array of economic, well-being, capability, political, and civic/cultural inclusion in its comprehensive,

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multidimensional concept of poverty (Wagle, 2005). These constructs are still lacking in the UNDP MPI. Wagle (2005) proceeded to develop own poverty measure for Kathmandu, India. The study consisted of 625 households investigated using 5 dimensions: wellbeing, political, social exclusion, cultural and economic dimensions. The study concluded that the developed poverty measure was the 'best measure' of poverty for Kathmandu but proposed to use ethnicity or religion and employment nature of employment. This study has incorporated both into its poverty measure.

Related to assertions by Wagle discussed above, Mtapuri (2011), concluded that multidimensional poverty measurement should have cultural dimensions and be site-specific than having generalised context as far as dimensions and indicators are concerned as "villages and communities can vary greatly in terms of the available livelihood-related services, such as energy and infrastructure. For reasons out of the villagers' power of decision, some services are unavailable by default." (Pasanen, 2017). The pertinent point here is that poverty measurement dimensions should vary from place to place depending on the poverty perceptions identified in each community.

Nurliyana *et al.* (2017:1) advised that multidimensional poverty "is [a] multifaceted phenomenon and different societies have different perceptions of poverty." It cannot be effectively and efficiently measured by three static dimensions as proposed by UNDP MPI. The researchers proceeded to develop their own multidimensional poverty measure using six dimensions for Malaysia, applied FGT for analysis and concluded that using both monetary and non-monetary dimensions improved poverty measure for Malaysia. They recommended researchers to continuously change their dimensions and indicators over time as poverty circumstances of the poor and society at large often change over time.

The UNDP (2020) admitted that its model data on health is weak and does not give wide and significant representation of indicators of that dimension. In the process it underestimates some households and groups within the society's actual circumstantial level of deprivations occurring. The UNDP justified data unavailability by insisting that it used 'careful judgments' to address missing data. This makes their results dubious because judgments can never give a good account of the society's convictions. The UNDP MPI concluded that a household must be deprived of more than six indicators of standards of living or in 3 standard of living variables and 1 health indicator or 1 education indicator to be identified as poor. Consequently, this makes the model less sensitive to minor inaccuracies that are inherent in the model given some data were provided by estimation (careful judgmental).

The other major weakness of the UNDP MPI is that it does not measure inequality among the poor despite decomposability of sub groups. Lastly the measure uses publicly available country data for the period from 2006- 2017. This data period does not allow cross country poverty comparability before and after. The use of stale data (for example 2017 data) set does not give a true picture of the current poverty given poverty is not static.

Given these weaknesses, it remains imperative to develop a new poverty measure for multidimensional poverty that considers the major setbacks of UNDP MPI measure. The poverty measure in this study incorporates many dimensions and indicators as well as being time sensitive (durational).

Hence to improve the UNDP, this study has added environmental dimensions made of four indicators. Also, aspects such as circumstantial poverty which were ignored by the UNDP MPI have been included in this measure. In its own admission, multidimensional poverty extends beyond the 10 indicators it uses, (UNDP, 2020). Furthermore, the UNDP (2020) concluded that its MPI has weaknesses due to data constraints and indicators that do not always reflect capabilities but give indicator outputs (years of schooling) and indicator inputs (cooking fuel). The dimensions used in this research are a part of various dimensions used in previous studies as shown below in Table 3-5.

Table 3-5: Human poverty dimensions in literature

Author(s)	Approach	Dimensions
Grisez <i>et al.</i> (1987)	Basic human values	bodily life—health vigor and safety, knowledge, skillful performance in work and play, friendship, practical reasonableness, self-integration, harmony with ultimate source of reality
Martha Nussbaum (2000)	Central human capabilities	life, bodily health, bodily integrity; senses, thought, and imagination; emotions, practical reason, affiliation, other species, play, control over one's environment
Max-Neef (1993)	Axiological categories	subsistence, protection, affection, understanding, participation, leisure, creation, identity, freedom
Narayan <i>et al.</i> , (2000 a)	Dimensions of wellbeing	material well-being, bodily well-being, social well-being, security, psychological well-being, freedom of choice and action
Schwartz (1994)	Human values	power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, security
Cummins (1996)	Domains of life satisfaction	material well-being, health, productivity, intimacy/ friendship, safety, community, emotional well-being
Ramsay (1992)	Human needs	physical survival, sexual needs, security, love and

Author(s)	Approach	Dimensions
		relatedness, esteem and identity, self-realization
Doyal and Gough (1993)	Intermediate needs	nutritional food/water, protective housing, work, physical environment, health care, security in childhood, significant primary relationships, physical security, economic security, safe birth control/childbearing, basic education
Qizilbash (1996 a)	Prudential values for development	health/nutrition/sanitation/rest/shelter/ security, literacy/basic intellectual and physical capacities, self-respect and aspiration, positive freedom, autonomy or self - determination, negative freedom or liberty, enjoyment, understanding or knowledge, significant relations with others and some participation in social life, accomplishment (the sort that gives life point/weight)

Source: Alkire, 2002: 98–100

The multidimensional measure of poverty in this study is sensitive to the length households and society's poverty and determines not only whether the same households are getting more deprived over time in specific dimensions as proposed for a good multidimensional poverty measure (Nicholsa, 2019).

3.3 DURATIONAL POVERTY MEASURES

There is little literature on durational multidimensional poverty in spite of poverty measurement having existed over a century ago (Nicholas *et al.* 2019:49). This is despite the fact that time variant multidimensional poverty measures help to analyse poverty sensitiveness to distribution of poverty and deprivations across households and individuals over a given time. Furthermore, durational poverty helps to understand poverty distribution within households over time by analysing the dimensions and indicators from time to time. Durational poverty also enables decomposability of poverty measure into three components: poverty as a result of deprivations count, dimensional poverty convexity and poverty due to durational convexity. Durational poverty measures are more informative and useful than static poverty measures in assessing accurately poverty over time. Nicholas *et al.* (2012:49) emphasised that:

While static poverty measures allow us to observe how aggregate level poverty changes over time (by calculating a poverty score for each period of observation), it is never clear if it is the same individuals who are becoming more (or less) deprived. A multidimensional measure of poverty that is sensitive to the length of deprivation would be able to account not only for whether the same individuals are getting more deprived over time, but also whether they are doing so in the same dimensions.

Moreover, it has been noted that most literature on poverty “ignores both the duration of deprivation experience within a particular year and after or before the year in question” (Osberg & Xu, 2000:1). This makes vast poverty measures inaccurate for effective and efficient policy interventions.

Bane and Ellwood (1986) undertook durational poverty measurement in which they investigated poverty spells and characteristics of each spell in the USA. Their study used Panel Study of Income and Dynamics (PSID). It tabulated income of people who completed spells in previous periods among low-income households for 12 years (1972-1980), to determine durational poverty exit. The study found low probabilities for poverty exit, implying people stayed in poverty longer (‘long timers’ in the parlance of the researchers). However, the study distinguished between permanent income poor from the population. The study recommended financial aid as one way that significantly reduces poverty spells.

Mertzler (2014) undertook analysis on deep chronic poverty for USA using $K\alpha$ and $P\alpha$ for period 1990-2010. The study used FGT model and adjusted FGT developed by Foster (2009). The study concentrated on high-risk subgroups which are the blacks, unmarried females and adults without high school qualification. It used head count of poverty denoted by (P_0), poverty rate measured by (P_1) and poverty severity represented by (P_2). The study concluded that some people are 90% in poverty most of the time. Nonetheless the study was limited in resources and cost of living adjustments.

Ghebru and Holden (2019) undertook durational poverty measurement on land rental among rural people in Ethiopia. The study was motivated by the fact that land in Ethiopia is very important and it accounts 40% of the national GDP and above 80% of employment in Ethiopia. It was also motivated to test existing empirical literature that landlessness in rural Ethiopia was the main cause of poverty. The study was based on 400 households from 16 villages in Tigray region, Northern Ethiopia for the period 1997-1998, 2000-2001, 2002-2003 and 2005-2006. The study used annual households’ expenditures and poverty line using year 2000 as the base year. Panel analysis and Kaplan–Meier methodology of survival functions were factored and found that local rural households who participated in land were 8% in 1997, 30% in 2000, 28% in 2003 and 26% in 2006. This indicated an increase over time in land tenancy and ownership. However, there were no meaningful improvements over time in welfare of the people as people in poverty increased to 72% (for tenants) and 52% (land lords) and in general, 70% of the people in the region remained below poverty line.

Nicholas and Ray (2012) produced a multidimensional durational poverty measure, a deviation from the ordinary static poverty measures. The study examined deprivations across dimensions over given time for Australia panel data. It was found that homeowners suffered fewer deprivations than non-homeowners. However, from the eight dimensions only health was non-income based. Hence further analysis is required which uses more non-income dimensions.

Later, Nicholas *et al.* (2019:50) were the first to develop a multidimensional poverty that can measure poverty across dimensions and indicators using Alkire & Foster (2011a) dimensional convexity axiom and also sensitive to time using Foster (2009) unidimensional durational convexity axiom variable. The study used longitudinal data from China from 2000- 2011 was used and the method satisfied many axioms. The study used durational aspect to separate chronic poverty from transient poverty. Chronic poverty is a serious form as it leads to social exclusion and this is not established when static poverty measures are used. Durational poverty measure was able to indicate whether households are becoming generally poor and the behaviour of all dimensions are analysed over time. The study concluded that high blood pressure, low education achievements and poor drinking water sources were the highest forms of poverty. The findings did not report on income variable and high blood pressure as effects of poverty.

Battiston *et al.* (2013) used multidimensional poverty measurement to determine poverty over space (cross country) and time on 6 countries: Argentina, Brazil, Chile, El Salvador, Mexico and Uruguay. The study used the period 1992–2006 and five dimensions which are education, sanitation, health, water, and shelter and school attendance across 48 indicators. The study produced mixed results as multidimensional poverty was found to be decreasing in Brazil, Chile and El Salvador and increasing in the other three countries. However, the findings were severely challenged because Chile and El Salvador are the poorest countries in that region.

3.4 POVERTY PERCEPTIONS

There are three broad theoretical poverty perceptions which are; the individualistic perceptions which assumes poverty should be solely blamed on the poor people themselves, the structural beliefs which assumes poverty is externally social, economic, political, cultural or societal aspect and lastly the fatalistic view that blames bad luck or illness (Smith & Stone, 1989, Sun, 2001 & Shek, 2004). There remains little evidence of studies on poverty perceptions for Harare and Zimbabwe. Poverty policies require the full understanding of how people and society perceive poverty.

Nasser *et al.* (2002) compared poverty perceptions for the period 1998-1999 among participants from three countries; South African (n=192), Lebanese (n=251) and Portuguese (n=120) using a questionnaire. The study sought to ascertain fatalistic, structuralist and individualistic causes of poverty. The research response rate was 96% and a stepwise regression analysis was used to estimate the poverty perception. The study found similar results as with Feagin (1972) that structuralist poverty was the main cause, followed by fatalistic and individualistic respectively. However, the study also found mixed results regarding education. In Portuguese it was found that children with uneducated mothers had lowest individual poverty perception whilst in South Africa, it was opposite and neutral for Lebanese. Further study is required to ascertain the true relationships between education and poverty perception.

Ambuye (2012) used poverty data from Ethiopia rural households through Ethiopian Rural Households Surveys (ERHS) to determine poverty perceptions in rural Ethiopia with data from 1989 to 2009 covering 15 villages using 39 questions. The study strove to measure if poverty was reducing as claimed by their government. There were mixed results as some variables such as health, credits and housing were actually improved but consumption and wealth decreased. Respondents were asked how they perceived happiness and the responses were that 60% were happy, 23% not too happy and 17% very happy. The assumption that happiness represented wellness was deduced from prior study by Dolan *et al.* (2008) and Clark *et al.* (1981) studies that both concluded that happiness income, socioeconomic, environmental and personal attributes represent wellbeing and happiness. The findings do not gel with other studies. Dercon, (2011) found that poverty actually increased during the same period and furthermore, in their own admission, the researchers used a small sample which was not representative of the country.

Delavega *at al.* (2016) researched on poverty perceptions amongst social work students in US. The study attempted to develop Blame Index and it employed nonprobability convenience sampling technique to target social work students for the period 2013-2014. The sample size used was 233 and the participants were of diverse social, economic, racial and culturally diverse backgrounds. The research used Survey Monkey, a cloud based and online administration of sampling and data collection method. The 5 perceptions of poverty scale (Castillo & Becerra, 2012) were used to on the questionnaires including perceptions on structural, government policies, social welfare benefits. Demographic and residential area (rural or urban) were also used. Statistical Package for the Social Sciences (SPSS) was used for data analysis, Pearson r correlation measured multicollinearity. ANOVA and *t* statistic tests were also used to establish demographic and personal data of the respondents. The results indicated a higher structural

perception and a lower personal perception of poverty. However, the study admitted that some of the variables such as race violated homoscedasticity and the study was indifferent to contestations between whites and blacks' perceptions. Hunt (2004) found that black people were more vulnerable to poverty when compared to white people.

Thompson *et al.* (2016) analysed poverty perception among student teachers at Oxford University. The study sought to establish the relationship of poverty on academic performance, wellbeing and learning. Questionnaires and focus groups discussions were used to collect data through mixed methods approach in which both qualitative and quantitative analyses were used to analyse data. The findings differed significantly with the findings above by Delavega *et al.* (2016). Perception of poverty was highly related to family and personal attributes compared to structural causes.

Earlier studies by Davids & Gouws (2011) found different results from Thompson *et al.* (2016). Davids & Gouws (2011) explored poverty perceptions in South Africa using a sample of 3,498 sample size from surveys. The study employed bivariate analysis. The Ordinary Least Square Regression (OLSR) and Factor Analysis (FA) Maximum Likelihood results found that structural poverty had the highest ratio followed by individualistic and lastly fatalistic causes of poverty. The findings deviate from Cozzarelli *et al.* (2001) who found that poverty for whites is more inclined towards individualistic attributes whilst for blacks it is more inclined towards structural attributes in the economy.

Castillo *et al.* (2013) studied social work student perceptions across Ghana universities. The study established the student perceptions of poverty and social welfare policies and used 2010 data set from 184 students (65 females and 119 males) across Ghana universities. A 5-point Likert scale questionnaire with 42 questions drawn from individualistic, structuralist and fatalistic perceptions was used. Logistic regression was used to analyse data and the conclusions are that age, gender, marital status, number of dependants affected the perceptions of poverty and social welfare policies. The log of the odds and structuralist perceptions were positively related by 264%. However, the study conceded that further exploration is required as respondents, by nature of their studies, were quite aware of social policies in Ghana and this could have affected outcomes. Furthermore, the study instrument was never tested for validity and reliability before it was deployed, signifying that further studies are required.

Stepanikova and Cook (2008) investigated whether poverty and lack of insurance are related to racial and ethnic bias in health care provision in USA. The study asked respondents to indicate

whether they have been judged by doctors or health staff in the last 2 years they have visited health facilities. The study included only respondents with regular visits to medical facilities. The study was made of 4 556 sample from blacks, Hispanic and whites from 2001 Survey on Disparities in Quality of Health Care. Logistic regression was used to achieve the study objective. A majority of the sample (78%), poor whites and blacks, indicated that they encountered discrimination.

Poverty is a multidimensional phenomenon which requires many dimensions to explain it (Davids & Gouws, 2011), hence the emphasis of this study to include several dimensions to bring further evidence on the causes of poverty. Also, the study establishes what Harare province perceptions of poverty are as a multidimensional rather than unidimensional. How would the difference in locations rural or urban, the race, the employment status, age, environmental attributes and nature of sanitation build poverty perceptions for Harare province remains under-researched in the existing studies. There is need to give opportunity to the poor to explain what they think are the causes of poverty they face every day and analyse the growing narrative that deep poverty is difficult to expunge and analyse (Davis & Williams 2020).

3.5 CONCLUSION

Poverty is a multidimensional challenge, the study explained the numerous empirical theories advanced to explain multidimensional poverty measurement. Durational poverty measurement lags behind as most studies concentrate on static poverty analysis and measurement. The choice for the dimension, indicator or cut-offs were determined by use of current and ongoing participatory public deliberations, use of dimensions and indicator variables that have been approved through public consensus, assumptions of what is important to people, authoritative convenience or convention including data availability. Empirical evidence as done before by other studies (Coudouel *et al.* 2002: 30; Artha& Dartanto, 2018: 3-14; Kim, 2018:1112) should rejuvenate the robustness of this construct as indicated already.

CHAPTER 4: ZIMBABWE COUNTRY PROFILE IN THE SOUTHERN AFRICAN CONTEXT

4.1 INTRODUCTION

Zimbabwe is a land locked country with total geographical area of 390,757.5 square kilometres and it is located in Southern Africa. It has geographical coordinates 20 000 S, 30 000 E. Zimbabwe is bordered by 4 countries which are Botswana to the west; Mozambique to the east; South Africa to the south and Zambia to the north (Indexmundi, 2020 & Zimstat, 2017). The country population was estimated in 2017 at 13,572,560 with average household size of 4.2 persons per family (Zimstat, 2017). Figure 4-1 is a Map of Zimbabwe showing Provincial Capitals and International Boundaries of Zimbabwe.



Figure 4-1: Map of Zimbabwe with Provincial Capitals and International Boundaries

Source: News Express, 2020

Zimbabwe is made up of 10 provinces and Harare is both the capital city and economic hub of the country. The second largest city is Bulawayo. Harare and Bulawayo are predominantly

urban cities whilst the remaining 8 provinces are largely rural and slightly urban (Zimstat, 2017). The main land use in Zimbabwe is commercial farming (A2), small scale farming (A1), resettlement, communal areas, national parks, large forests and urban cities.

4.2 ZIMBABWE, REGIONAL AND WORLD REAL SECTOR STATISTICS

The study assesses Zimbabwe statistics on population at provincial and/ or national characteristics and real sector performance. Statistics in the African continent are largely on Sub Sahara and then world statistics are discussed. COVID-19 is discussed in detail as it has caused major output decline across the world.

4.2.1 Zimbabwe Provincial and National Population

The 10 provinces and population distribution for Zimbabwe are shown in Table 4-1 below:

Table 4-1: Zimbabwe Provincial Populations breakdown, 2017

PROVINCE	POPULATION	% OF COUNTRY POPULATION
Bulawayo	738 600	5.4
Manicaland	1 861 755	13.7
Mashonaland Central	1 441 944	10.6
Mashonaland East	1 366 522	10.1
Mashonaland West	1 567 449	11.5
Matabeleland North	744 841	5.5
Matabeleland South	810 074	6.0
Midlands	1 514 325	11.2
Masvingo	1 553 145	11.4
Harare	1 973 906	14.5
TOTAL	13 572 560	100

Source: Zimstat (2017:8)

The total population for Zimbabwe was 13,572,560 (Zimstat, 2017), however World Bank now estimates it to be 17.3 million (World Bank, 2020). Harare holds the largest population at 14.5% whilst Matabeleland North is the smallest province with 5.5 % of the country population. The total number of households in Zimbabwe in 2017 was 3,255,463 and the average size of the households was 4.2 people per household.

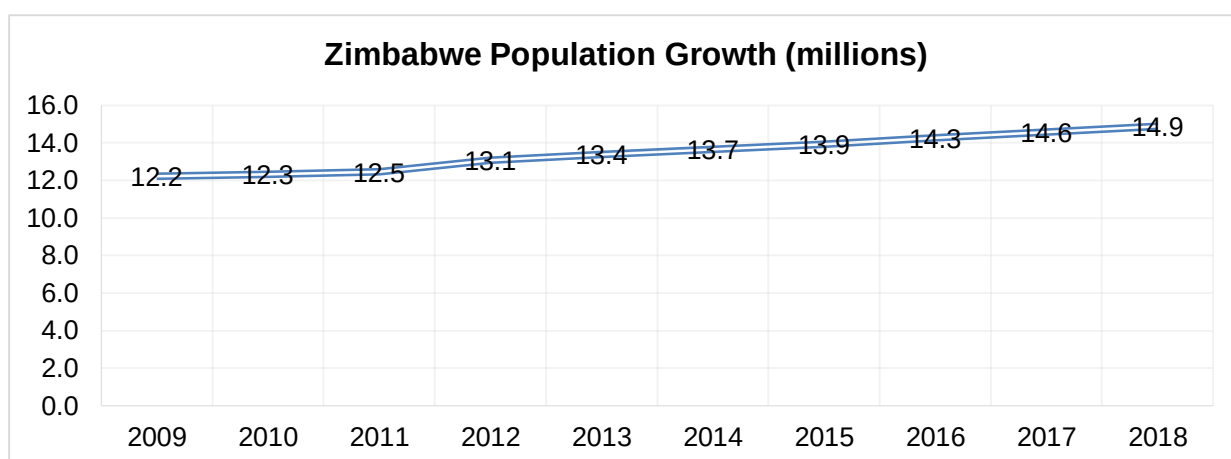


Figure 4-2: Zimbabwe population growth (millions)

Source: Reserve Bank of Zimbabwe, 2019

According to Figure 4-2, the country population has been increasing by an average of 2.27% since 2009 and this is attributed to stable fertility (Zimstat, 2018) and constant birth rate of 3.75% (UN, 2019). This evidence has negatively impacted on service delivery and employment.

Table 4-2: Zimbabwe Population Characteristics

Indicator	2018	2019	2020	2021
Population growth (annual %)	1.47	1.53	1.5	1.54
Urban population growth (annual %)	2.223	2.276	2.31	2.34
Population aged < 15, (% of total)	41	41.83	41.91	41.32
Population ages 15-24, (% of total)	20	20.1	20.3	20.45
Population of 65 years and above (as % of total)	2.93	2.98	3.01	3.05
Life expectancy at birth, total (years)	61.195	61.49	61.738	61.965

Source: ADB, 2019

Zimbabwe's majority population is below 24 years (61%), making the country a youthful economy. From the table, the life expectancy at birth for Zimbabwe improved from 61% in 2018 to 62% in 2020.

4.2.2 Zimbabwe Population Distribution

Zimbabwe's population is concentrated in rural areas (9,229,340.80) with 68% rural population whilst 32% (4,343,219.20) is urban (Zimstat, 2018). Figure 4-3 shows population distribution in Zimbabwe.

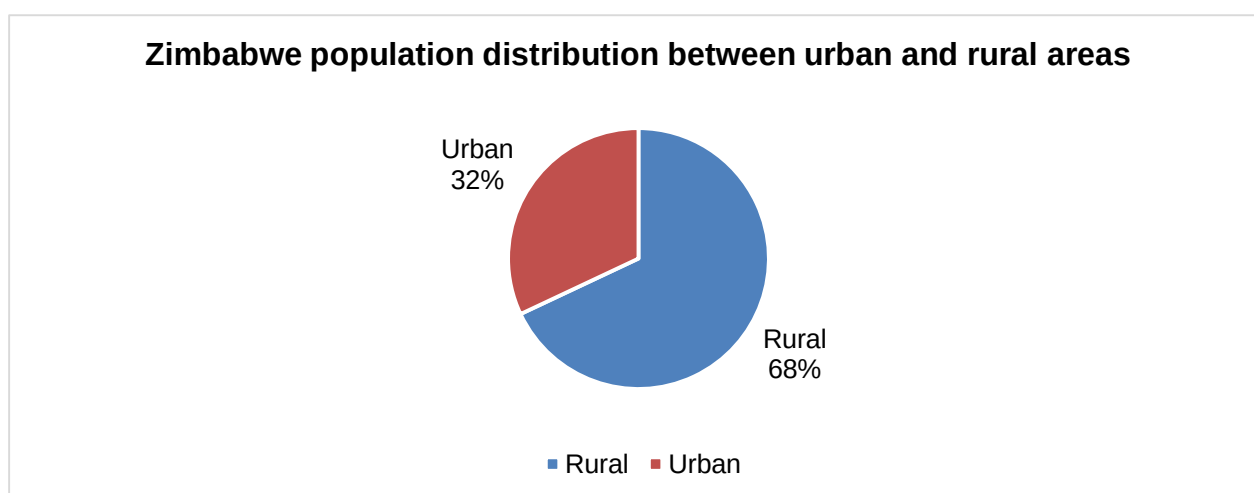


Figure 4-3: Zimbabwe Population Distribution between Urban and Rural

Source: Zimstat, 2018

Zimbabwe is an agriculture-based country with 42% of its land devoted to this activity. Prior to independence from Britain in 1980 to the early 1990s, Zimbabwe used to be the breadbasket of Southern Africa. Like the whole of SADC, the staple grain for Zimbabwe is grain maize but other grains such as wheat, millet and sorghum are grown extensively. Tobacco varieties which are Virginia Flue-Cured, burley and oriental tobacco, combinedly termed (Zimbabwe golden leaf) are the most grown varieties. Tobacco is the highest foreign currency earner for the agriculture export products and cotton is the second.

4.2.3 Life Expectancy and Mortality Rate in Zimbabwe

The life expectancy of Zimbabwe is estimated at 60.8 years while child mortality rate (under 5 years) has been on a downward trajectory since 1960s, from a maximum of 151 to 2018 figure of 42.20 (World Bank, 2020). Child mortality lowered by 28.65% in Zimbabwe mainly due to improvements in prenatal and neonatal care. High standards of health care during prenatal enable the survival rate after birth to rise (Makate & Makate, 2017).

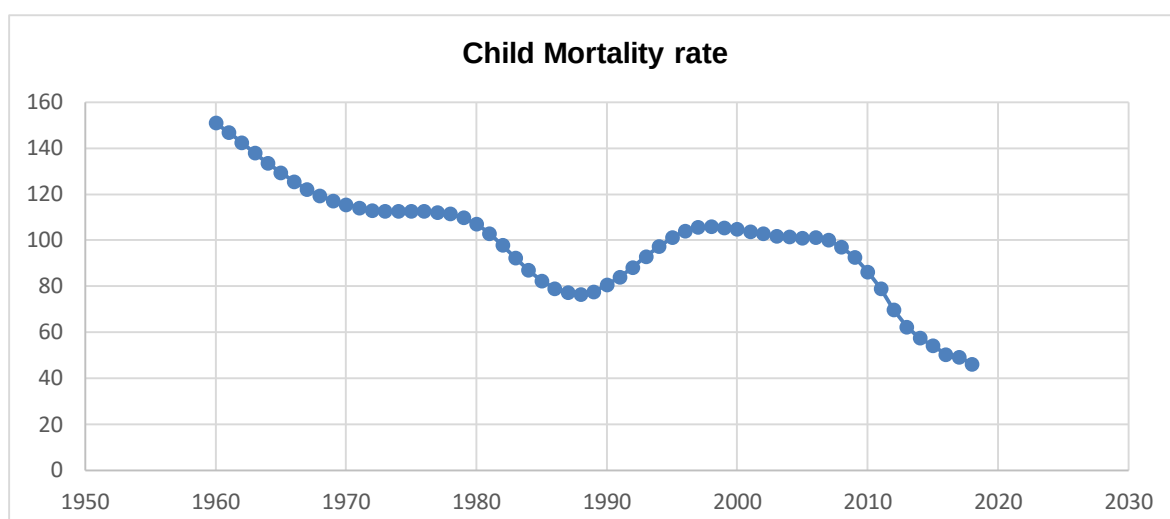


Figure 4-4: Child mortality rate

Source (UNICEF, WHO, World Bank, UN, 2020 & CMO, 2020)

Figure 4-4 shows that child mortality is decreasing per 1000 but remains slightly high (currently above 40 per 1000). The largest decrease in child mortality was recorded after 2010. Child mortality has a negative effect on population growth.

4.2.4 Country Indicator Values for Zimbabwe

Zimbabwe has 13% skilled labour and 27% internet usage (UNDP, 2020).

Table 4-3: Indicator Variables and values

Indicator Variable	Value
Skilled Labor force as a percentage of total labor	13%
Mobile phones subscription per 100	89.4
Internet usage	27.1%
Gender Development Index (GDI)	0.925
Inequality adjusted HDI	0.435
GNI per capita	2.661
Gross Capital Formation (% of GDP)	12.6
Expected years of schooling	10.5
Carbon dioxide emissions per capita (tons)	0.7
UNDP HDI	0.56
UNDP MPI	0.137

Source: UNDP (2020)

Table 4-3 depicts that the rate of mobile phone usage in Zimbabwe is 89.4 per 100 while the MPI for Zimbabwe is 0.137 and HDI is 0.56 (HDR, 2020; UNDP, 2020). The level of carbon dioxide emissions for Zimbabwe stands at 0.7 tonnes per year.

4.2.5 Zimbabwe Agricultural Land

Table 4-4: Arable land agricultural mode of production

Area Description	Total Area (million) Ha
Animal and manual draft (small scale farming)	1.0 ha
Motorized draft power (medium scale)	0.5 ha
Large scale farming (A2)	2.8 ha
Total arable land	4.31 ha

Source: GoZ, Transitional Stabilisation Programme (TSP), 2018

The study now assesses other macroeconomic variables for Zimbabwe before giving a full analysis of poverty in Zimbabwe. This allows the study to unravel poverty dynamics in the country.

4.2.6 Zimbabwe food crop production 2016-2018

The most grown crop is maize as it is the staple food for the country and for the entire Southern Africa. However, recently there has been a sharp decline in food output due to El Nino drought and Cyclone Idai (emanating from Indian Ocean) both experienced between 2016 and 2018. These natural hazards left a trail of devastation and destruction. The total food crop output went down by 801 394 tons for the period 2016-2018 as shown in Table 4-5.

Table 4-5: Food Crop Output for period 2016-2018

Food Crop Output	2017/2018 (tons)	2016/2017(tons)	Variance	% Change
Maize	1,700,702	2,155,526	-454,824	-21.1
Sorghum	77,514	182,012	-104,498	-57.4
Pearl Millet	48,844	82,662	-33,818	-40.9
Finger Millet	9,085	24,107	-15,022	-62.3
Ground Nut	127,202	139,503	-12,301	-8.8
Sweet Potato	321,662	513,070	-191,408	-37.3
Sugar Beans	21,320	15,356	5,964	38.8
Soya Beans	59,772	35,744	24,028	67.2
Cow Peas	16,380	35,895	-19,515	-54.4

Reserve Bank of Zimbabwe, 2018

There is serious decrease in food output between the two farming seasons highlighted on Table 4-5 above. Maize, which is the country's staple food, recorded a decrease of 21.1%, pushing many households into deep poverty across the country and more so in country's rural areas. The graph in Figure 4-5 highlights the actual trends in food supply from food crop for the seasons 2016-2017 and 2017-2018.

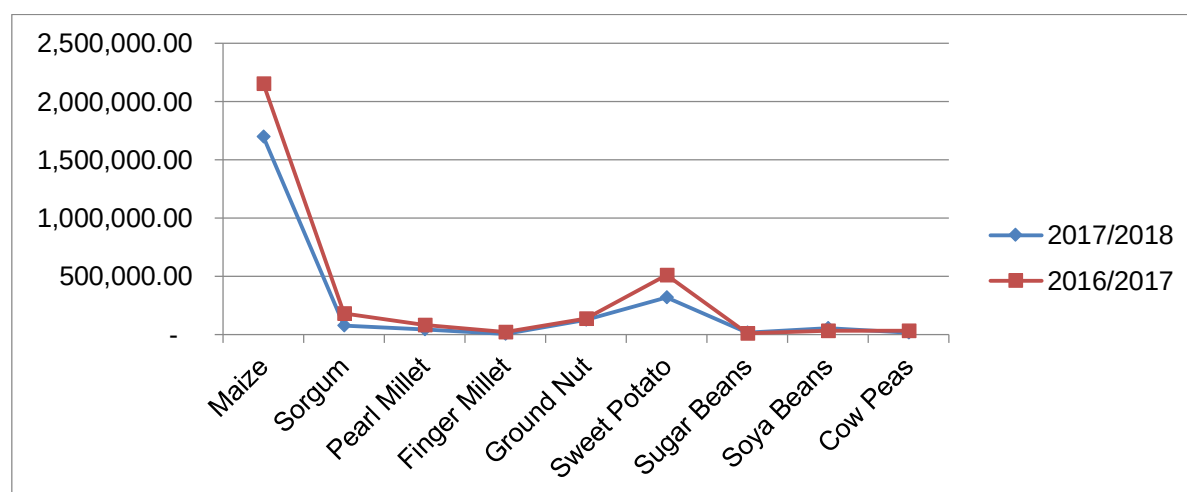


Figure 4-5: Food crop production trend analysis

Source: Reserve Bank of Zimbabwe, 2018

The graph in Figure 4-5 shows the output movements of food crops from 2016 to 2018. National output on food crop decreased between 2016-2017 and 2017-2018 farming seasons and this is mainly attributed to recurrent Elnino drought.

4.2.7 Real Gross Domestic Product for Zimbabwe

The GDP for Zimbabwe for 2019 is estimated at USD\$13 billion while the GDP per capita is USD\$749 (World Bank, 2020). The real GDP trended in the negative from 2019 mainly due climate induced El-Nino drought, Cyclone Idai and the global COVID-19 pandemic among other causes (RBZ Monetary Policy Statement, 2020). Prior to Covid-19, the economy was expected to contract by 1.7 but the Covid-19 pandemic worsened the situation and resulted in the economy contracting by 8.7%, World Bank (2020). According to World Bank, the contraction of GDP is a result of structural deficiencies, climate shocks, drought in consecutive years, foreign currency and power shortages for the industry. The graph in Figure 4-6 below shows GDP movements from 2008 to 2020.



Figure 4-6: Zimbabwe GDP from 2009- 2020

Source World Bank, 2020

Gross National income for Zimbabwe is 12.6% of GDP (UNDP, 2020); the rest of the GDP indicators are shown in Table 4-6 below:

Table 4-6: Zimbabwe GDP Indicators for 2018

Indicator	Value (USD\$)
GDP (2011 PPPs, USD \$Billions) (2018)	38.8
GDP per capita (2011 PPPs)	2.888
GNI per capita (2011 PPPs)	2.661
Gross Fixed Capital Formation (% of GDP)	12.5
Labor share of GDP (% of GDP)	50
Income index	0.496

Source: UNDP, 2020

The GDP for Zimbabwe was at 38.8 USD\$ billion in 2018 but only 12.5% (USD\$4.84 Billion) was allocated for capital formation in that year. Zimbabwe was downgraded to low-income from low middle income by the World Bank in 2019 because the GNP per capita decreased further below USD\$950 (World Bank, 2020).

4.2.8 Health Indicator for Zimbabwe

Zimbabwe GDP for health was recorded at 9.4% of GDP in 2018 which is above the Sub-Saharan Africa average health spending as a percentage of GDP (IMF, 2019:11). Health spending is also above the minimum recommended SDG spending of 7.5% of GDP. Zimbabwe has HIV prevalence rate of 13.3% in adults aged 15-49 years and the rate is exactly the same

as the US rate (HIV.org, 2020). In total, 1.4 million Zimbabweans are living with HIV. It is reported that 40 000 get infected every year and 20 000 die from AIDS-related deaths. Of the people living with HIV, 86% adults are on antiretroviral treatment while 71% infected children are on medication too (avert.org, 2020).

Malaria remains one of the top killers in Zimbabwe and there were reported cases of 1.8 million in 2006 and 281 000 in 2016 (UNDP, 2018) and 85% of the population is at risk of malaria (MoHCC, 2020).

4.2.9 Education Indicator for Zimbabwe

Zimbabwe Constitution of 2013 specifies education as a fundamental human right and to this effect, the government produced Education Sector Strategic Plan 2016-2020 aimed at addressing 4 SDGs. These are set to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all; SDG 5: achieving gender equality and empowering all women and girls; SDG8, target 8.6 which aims to “substantially reduce the proportion of youth not in employment, education or training” by 2020 and SDG4: target 4.2, on access to equitable and quality access to Education Childhood Development, care and pre-primary education for the readiness of children for primary education (Ministry of Primary and Secondary Education, 2018:viii).

The total population of school going age (3-18years) in Zimbabwe was 5 601 398 out of which girls were 2 804 775 and boys 2 796 623 (Zimstat, 2017). The country had 628 826 girls and 316 210 boys in ECD A and ECD B in 2018 following successful implementation of Early Childhood Education (ECD) policy in 2005, and the total school children in primary education were 2 725 970 (1 356 828 girls and boys 1 369 142) (Ministry of Primary and Secondary Education, 2019: x). Based on the above statistics, 2 875 428 children were not in school in 2018 despite reports of increases in schools infrastructure emanating from government expansion education policy; 6 242 ECD public education facilities, 6 288 primary schools and 2 871 secondary schools (Ministry of Primary and Secondary Education, 2019).

According to the Ministry of Primary and Secondary Education (2019: x), there were 1 093 550 children in Form 1-6 out of which 996 790 are Form 1-4) while 96 760 were in Form 5-6. Of this figure, girls constituted 47.41% of the total secondary enrolment while boys had 52.59%. A nine-year education indicator analysis for Zimbabwe for period 2000-2014 is provided in Figure 4-7.

Table 4-7: Education Indicators for Zimbabwe 2000-2014

Education Indicator	2000	2001	2002	2003	2010	2011	2012	2013	2014
School enrolment, primary (% gross)	105.8	110.2	105.3	104.3	106.8	110	112	109.	112
School enrolment, primary, female (% gross)	104.4	108.7	104.1	103.2	100.3	103	111	108.	100.
School enrolment, secondary, female (% gross)	42.2	43.1	40.7	37.4	35.5	36.0	50.1	51.3	53.2
Literacy rate, adult total (% of people ages 15 and above)	80.0	82.3	82.9	83.1	83.2	83.5	85.0	86.0	88.6
Literacy rate, adult male (% of males ages 15 and above)	85.3	87.2	86.6	87.5	86.6	87.7	88.9	89.0	89.1
Literacy rate, adult female (% of females ages 15 and above)	75.2	78.2	78.6	77.2	80.2	80.0	83.2	86.2	88.2
Percentage of GDP Spent on Education (%)	1.33	1.09	1.4	1.3	1.54	2.36	6.07	6.00	6.14

Source: ADB, 2019

From the table 4-7 above, the percentage of GDP spent on education is below the UN SDG, Incheon Declaration that sets minimum of 4-6% of national GDP and or between 15-20% of public expenditure to be channelled towards education (UN, 2020). The level of total primary school enrolment is higher and in most cases above 100%. However, the enrolment for secondary female students is around 50%, implying that 50% female children dropped out of school before completing secondary education. Annexure C provides a detailed breakdown of the education system for Zimbabwe from ECD to tertiary education.

4.2.10 Employment in Zimbabwe

The level of unemployment in Zimbabwe has remained high, with almost 50% of the population not employed in the formal market before 2004 but peaked in 2020 the level of formal employment is 59.4%. The unemployment rate is 40.6% against a desirable unemployment rate of 2-3% (UN, 2019). Hence, the Zimbabwe unemployment rate is exceptionally high and depicts an economy in crisis. UN and International Labour Organisation (ILO) predicted an unemployment level of 37% for the year 2020 for Africa (ILO, 2019) hence Zimbabwe's unemployment rate of 4.6% falls above Africa's minimum.

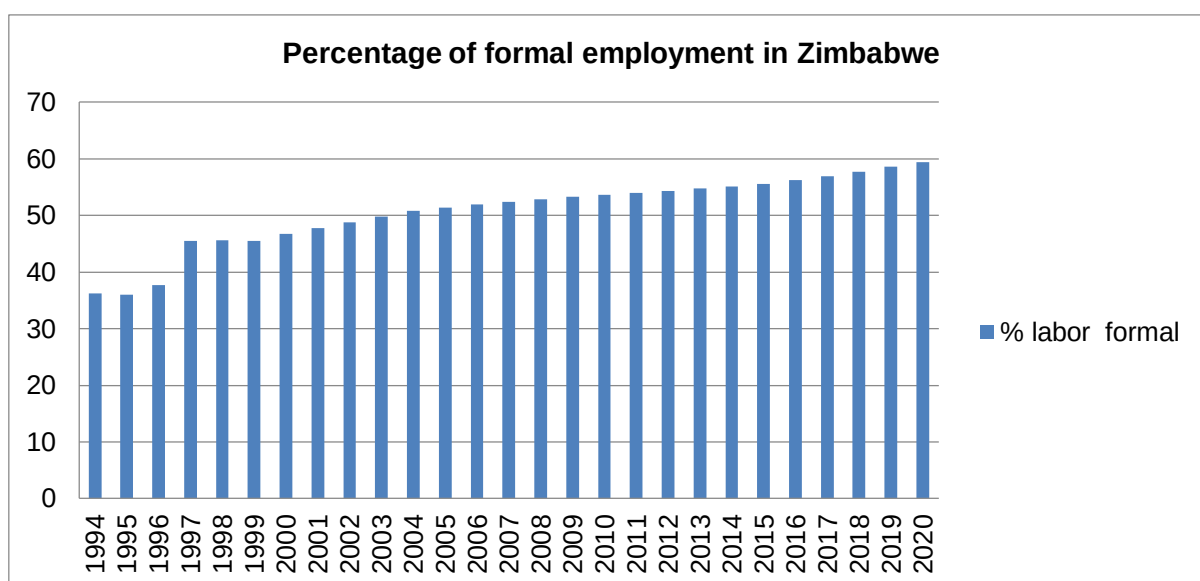


Figure 4-7: Percentage of formal employment in Zimbabwe

Source: ADB, 2019

Figure 4-7 shows that employment has remained near stagnant for the period from 2015 to 2020. Large improvements in the country's employment were recorded for the period 1994-1999. This is despite the fact that ESAP implications reduced employment for that period.

4.2.11 Government of Zimbabwe National Accounts- Revenue and Expenditure

Table 4-8: Government Revenue and Expenditure

Government Accounts (US\$ m) *	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Revenue excluding grants	933.6	2,339	2,92	3,495	3,741	3,727	3,737	3,502	3,950	5,29
Revenue including grants	933.6	2,339	2,92	3,495	3,741	3,727	3,737	3,502	4,375	5,29
Capital expenditure at net lending	45.20	415.1	446.	302.0	386.0	310.3	252.0	387.2	1,530	3,09
Recurrent Expenditure	744.9	1500.	2,27	2,983	3,206	3,387	3,348	3,807	4,515	5,19
Total expenditure and net lending	920.9	2177	3,05	3,587	3,981	3,916	3,923	4,705	6,045	8,16
Balance excl grants	13	161	-129	-92.1	-240	-189	-186	-1,20	-2,09	-2,9
Balance incl grants	13	161	-128	-92.1	-240	-189	-186	-1,20	-1,66	-2,8

Source: IMF, 2019

Table 4-8 shows that revenue collected by the government increased over time but was largely expended by recurrent expenditure which by 2018 took almost 100% of revenue. Capital expenditure was grossly suffocated in this period. Besides, in 2017, Zimbabwe did not receive grants to factor into consolidated revenue envelope and this is a serious threat to communities, mostly in rural areas which require grants to enhance sustainability.

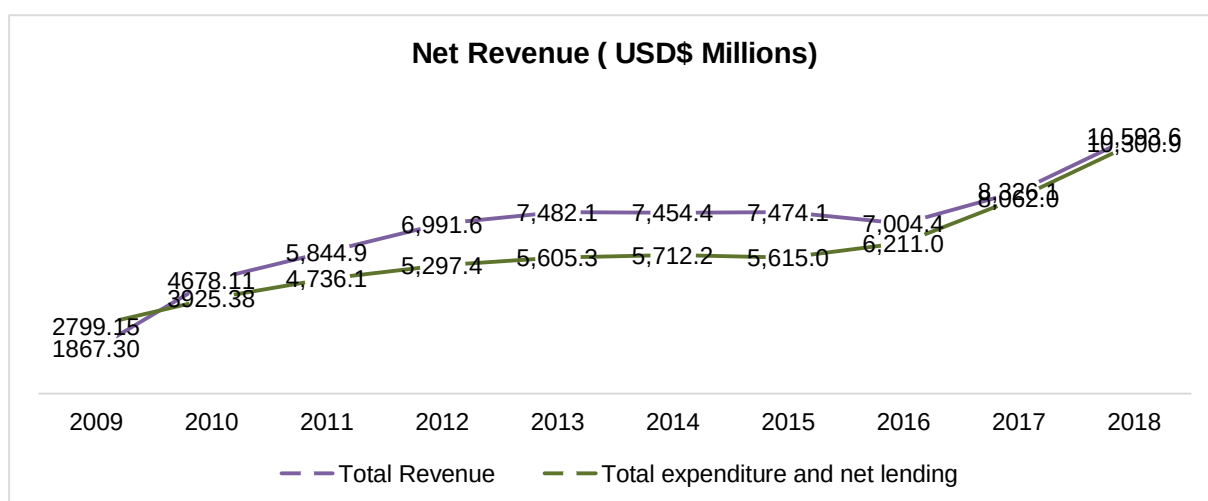


Figure 4-8: Zimbabwe Net Revenue (USD\$ MILLIONS)

Source: IMF, 2019

From 2016, net revenue was above expenditure from 2010 to 2015. From 2016, net revenue was equal to expenditure. The level of net revenue above depicts a country with no development funds, savings funds, stabilisation funds and resource funds but solely relying on tax revenue to fund its expenditure.

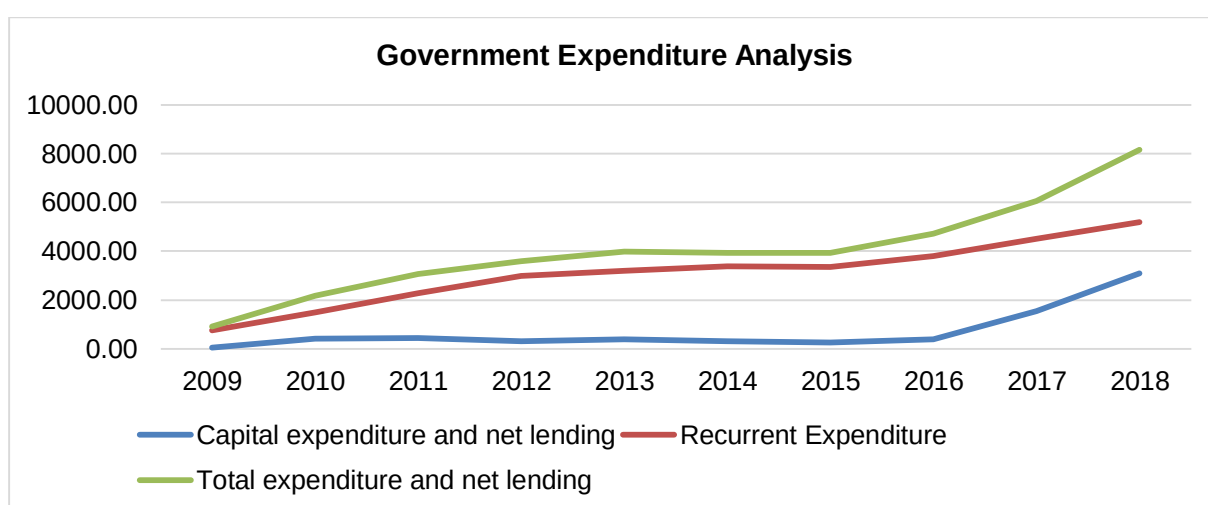


Figure 4-9: Government Expenditure Analysis

Source: IMF, 2019

From the graph above in Figure 4-9, recurrent expenditure wipes most of the government revenue despite the fact that there is an inverse relationship between economic growth and recurrent expenditure. This is tandem with existing findings on the Zimbabwean economy (Devarajan *et al.* 1993; M 'Amanja & Morrissey 2005; Mulinge, 2016).

4.2.12 Major Real Sector Growth Rates in Zimbabwe

The only sectors in Zimbabwe that have enjoyed positive growth rates are the construction and distribution sectors. The financial sector started to show some positive but inconsistent growth rates from 2015 to 2017. Electricity has been a challenge in Zimbabwe given the Elnino drought that affected Zimbabwe Electricity Supply Company, Kariba Power Plant and the power debt to Eskom power company of South Africa to the tune of 322million Rands (Herald: 7 November 2019).

Table 4-9: Real Sector performance for period 2010-2017

REAL SECTOR%	2010	2011	2012	2013	2014	2015	2016	2017
Agriculture and forestry	7.2	1.4	7.8	-2.6	23.0	-5.2	-3.9	10.0
Mining and quarrying	41.4	24.4	8.0	11.7	-3.4	0.4	4.1	3.5
Manufacturing	73.2	13.8	5.3	-0.6	-5.1	0.2	0.6	1.3
Electricity and water	19.5	6.4	0.3	5.0	5.4	-5.7	-1.6	4.0
Construction	-13	65.1	23.5	3.9	6.9	4.0	1.5	3.9
Distribution, Hotels and restaurants	10.3	4.3	4.3	3.9	2.5	3.8	6.8	7.6
Financial, banking and insurance activities	-25.9	-4.1	78.1	-4.3	-15.1	5.5	4.7	3.1

Source: Reserve Bank of Zimbabwe, 2018

Table 4-9 shows that despite the recurrence of severe Elnino droughts, agriculture performed well in 2017. Distribution, hotels and restaurants sector has been performing better from year to year whilst manufacturing and construction have not performed extremely well over the period from 2010-2017.

Table 4-10: Projected growth in real sector 2020-2023

Real Sector %	2020	2021	2022	2023
Overall GDP	-4.1	7.4	5.5	5.2
Agriculture and Forestry	-0.2	11.3	8.9	7.6
Mining and Quarrying	4.7	11.0	7.4	8.8
Manufacturing	-9.6	6.5	6.5	7.7
Electricity and Water	-7.9	18.8	14.4	5.9
Construction	-11.4	7.2	5.0	4.0
Distribution	-7.5	5.7	6.6	5.1
Transport and Communication	3.2	7.1	4.5	4.4
Finance and Insurance	-7.1	7.2	3.8	5.3
Government Services	-2.1	6.2	1.7	2.2

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Real Sector %	2020	2021	2022	2023
Other Services	-2.1	4.3	3.1	2.5

Source: Ministry of Finance and Economic Development 2020 Budget

It is projected that total output will fall by -4.1% before growing by 7.4% in 2021. Transport and communication remain the only real sector with growth rate above zero in 2020.

4.2.13 Level of Zimbabwe Exports

The export per capita for Zimbabwe for 2018 was USD\$309 (OEC, 2020) and Zimbabwe's main export destination is South Africa, which consumes 43.5% of its total exports while United Arab Emirates is a distant second with 22.8% of exports. Main exports for Zimbabwe are gold (USD\$1,95B), nickel (USD\$488.5m), tobacco (USD\$467m), ferroalloys (USD\$466m), chrome (USD\$229m) and cotton (USD\$41.6) (OEC, 2020). The major export destinations for Zimbabwe are shown below in Figure 4-10.

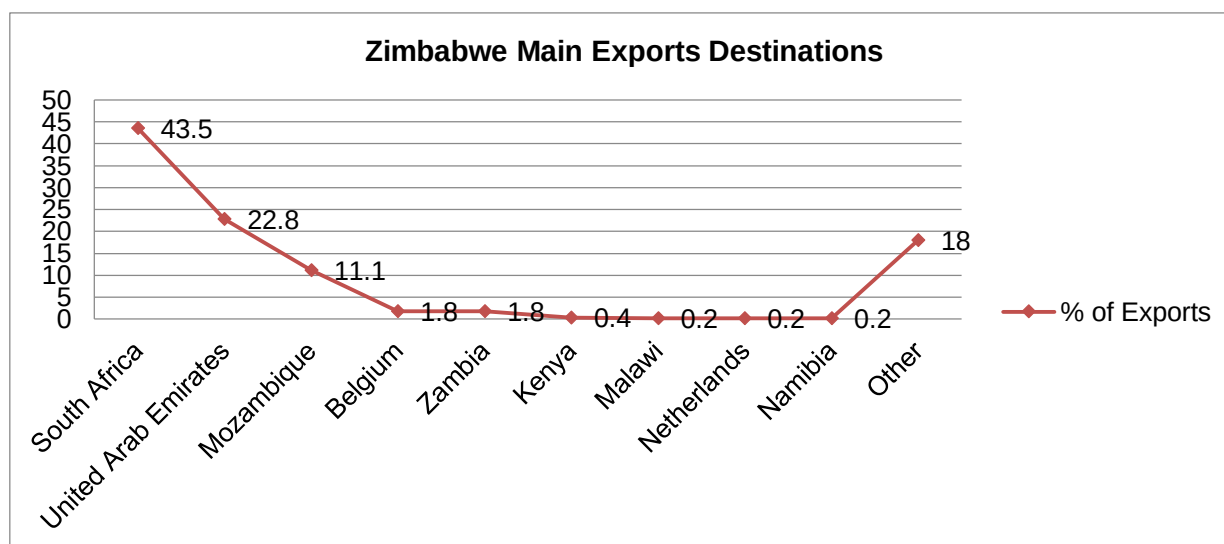


Figure 4-10: Zimbabwe Main Exports Destinations

Source: Reserve Bank of Zimbabwe, 2018

The major export destination for Zimbabwe is its neighbour, South Africa, which consumes 43.5% of the total exports of the country. United Arab Emirates ships 22.8% of exports from Zimbabwe. Nonetheless, the exports revenue is below the imports that the country consumes from other countries and this is depicted in Figure 4-11.

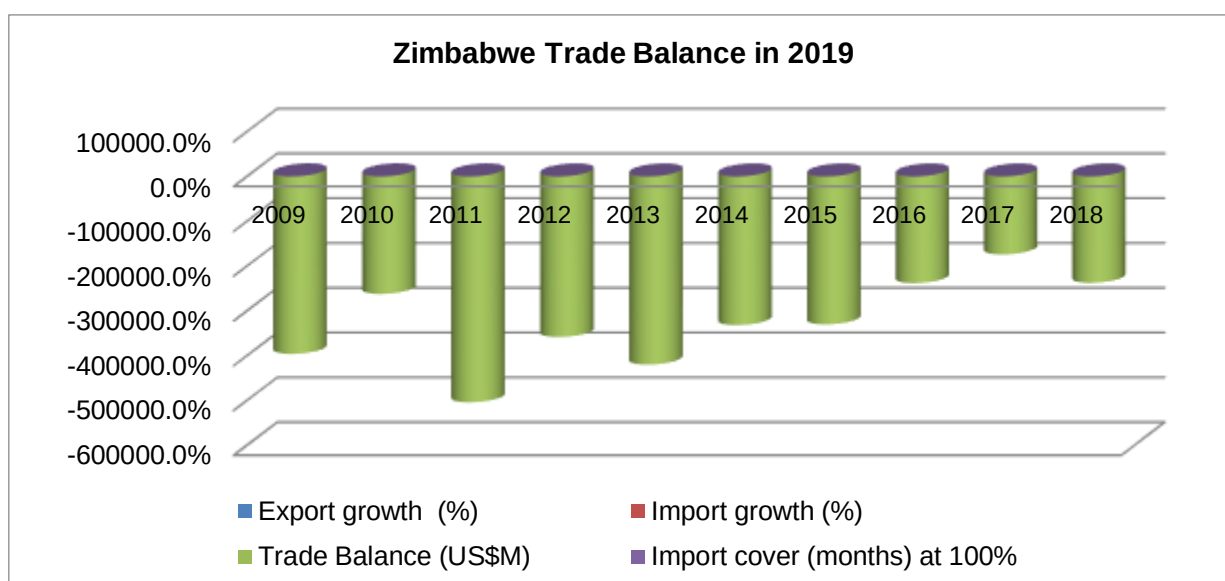


Figure 4-11: Trade Balance

Source: Reserve Bank of Zimbabwe, 2019

Figure 4-12 shows that the level of imports heavily outweighed the level of exports proceeds generated by the country and the trade balance has been in the negative since 2009. This is because major exports are primarily agricultural and raw materials to semi-finished products. The imports for Zimbabwe for 2018 were valued at USD\$5, 99 billion compared to exports of USD\$4, 46 billion, hence there is a negative trade balance of USD1, 53 billion (OEC, 2020). The country's balance of payments for 2018 was in the negative by 784.2 and 709.7 for the 1st quarter and 2nd quarter respectively. Table below highlights exports and imports for 2018 for Zimbabwe.

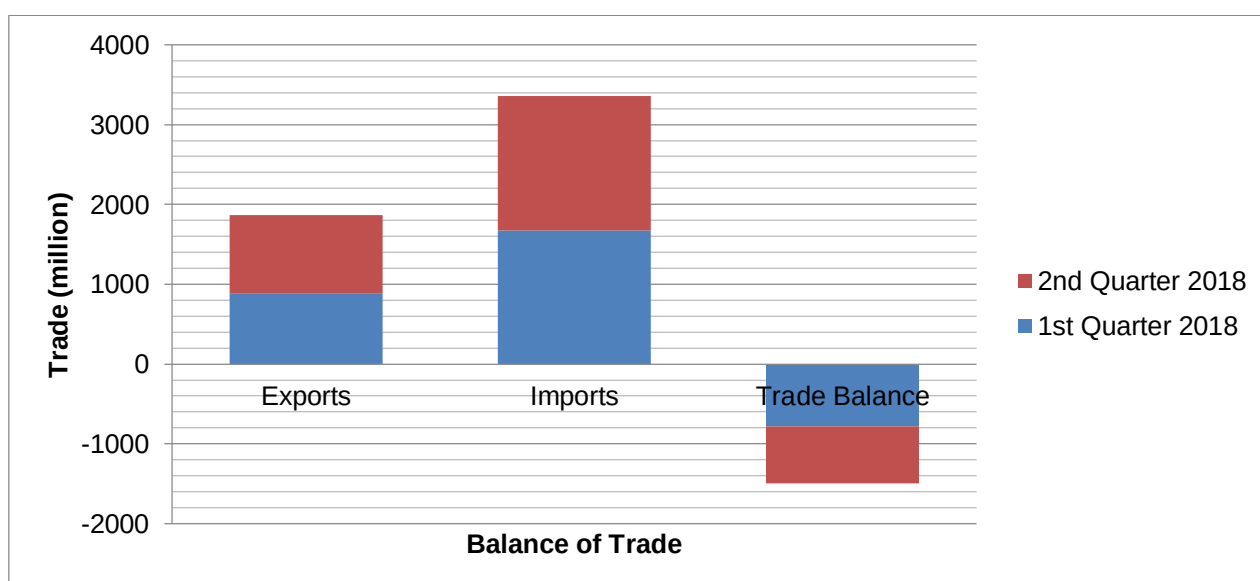


Figure 4-12: Exports and imports for 2018 for Zimbabwe

Source: IMF, 2019

The balance of trade for Zimbabwe is negative because exports are relatively cheaper than imports. This is due to the fact that exports are primary raw materials and unfinished goods while imports are finished goods and capital in nature. The other main export product for Zimbabwe is minerals and the production levels for period 2017-2018 is depicted on Table 4-10.

4.2.14 Zimbabwe Minerals Production

Zimbabwe is endowed with 60 various minerals such as gold, diamond, platinum, coal, silver, chrome, asbestos, copper, nickel, granite and others. Mining represents 55% of the country exports. Table 4-10 provides highlights of output of some minerals for 2017 to 2018. Table 4-10 shows major minerals extracted in Zimbabwe.

Table 4-11: Minerals Production in Zimbabwe

Output	Q2:2018	Q1:2018	Q2:2017
Gold (kg)	10.4	7.7	5.8
Chrome (tons)	503.9	411.4	352.2
Coal (tons)	1041	880.5	909.1
Nickel (tons)	4	4.8	4.6
Platinum kg)	3.4	3.7	3.7
Diamond (carats)	1001.9	902.6	820.8
Palladium (kg)	2816	3087	3047

Source: Reserve Bank of Zimbabwe, 2018

Gold increased by 79.3% from second quarter of 2017 to second quarter of 2018 and this was due to increased gold delivery by artisanal miners to Fidelity Printers and Refiners (FPR). Platinum decreased by 0.3 kg between 2018 and 2017 second quarters. The real GDP was projected to fall by 2.1% in 2019. The Government of Zimbabwe Public Debt has ballooned to 55.9% of the GDP.

4.2.15 Zimbabwe Foreign Currency Exchange

Prior to setting up of Foreign Currency Auction, the local currency was mostly being traded on black market than the formal market. On 17 June 2020 the Reserve Bank of Zimbabwe introduced the Dutch Foreign Currency Auction system which uses weighted average rate to determine the exchange rate. The Foreign Currency Auction system is meant to stabilise the foreign exchange market against the black market by “bringing transparency and efficiency in the trading of foreign currency in the economy” (RBZ, 2020). The auction system started off on

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23 June 2020 at 1USD\$: ZWL\$57.3586 and settled month by month as shown in Table 4-11 below:

Table 4-12: Reserve Bank of Zimbabwe Foreign Currency Auction System

Day of trade	Closing Rate ZWL\$
23 June, 2020	57.3586
30 June, 2020	58.2186
28 July, 2020	77.9110
31 August, 2020	84.6504
30 September, 2020	82.6656
30 October, 2020	82.5734
30 November 2020	83.0423
31 December 2020	83.0134

Source: RBZ, 2020

The foreign currency exchange rate has stabilised around 1USD\$: ZWL\$83. The foreign currency traded from the first day of trade was USD\$10,345,250.04 and thereafter the average traded on a weekly basis now stands at USD\$29,000,000.00 and yearly trade of USD\$1,392 billion. The average yearly total foreign currency from the auction system of USD\$1,392 billion falls short of the average yearly required total of USD\$5,99 billion. The shortfall is likely to be met by the black market and this is most likely to push the black-market rate up, making it more attractive than the formal market.

4.2.16 Zimbabwe Stock Market Performance

The ZSE Industrial Index grew by 336.3 points between 2009 and 2018. However, between 2015 and 2016 the industrial index fell below the 2009 figure. The grand market capitalisation grew by 16.15% for the period 2009 to 2018. Figure 4-13 below displays Zimbabwe stock market performance for the period 2009-2018.

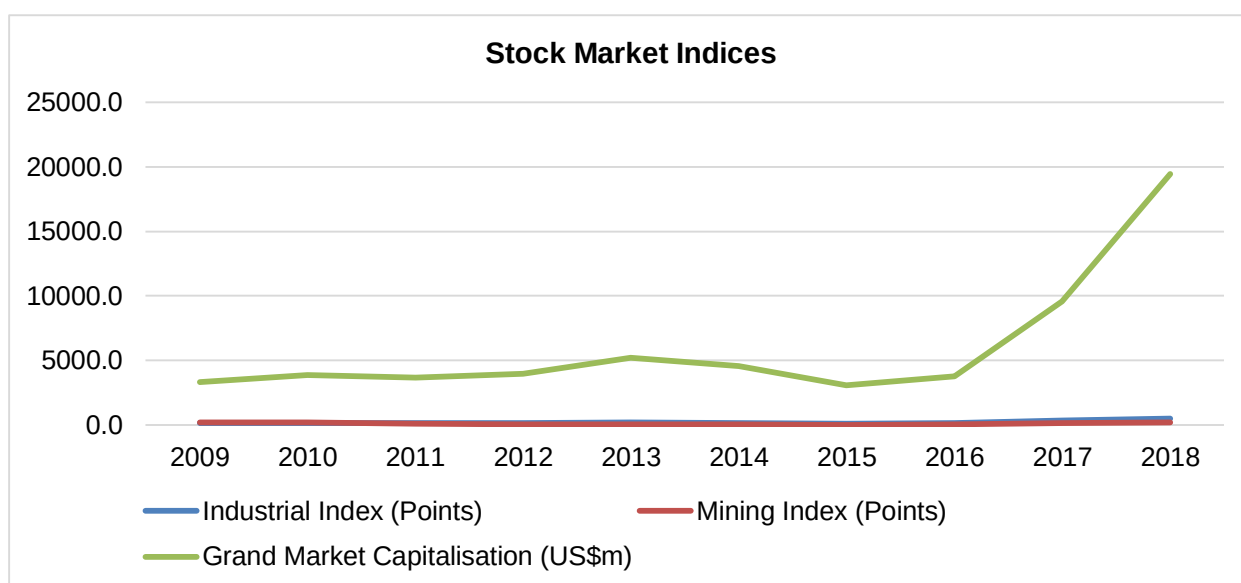


Figure 4-13: Zimbabwe Stock Market Performance

Source: Reserve Bank of Zimbabwe, 2018 Zimbabwe Bank Lending Rates from 2009-2018

The lending rates went as high as 58% in 2011 before it settled at 18% from 2016 to 2018. The lending rates, however, remained higher and are attributed to default rates (RBZ, 2018). Zimbabwe lending rates for 2009-2018 are shown below in Table 4-13.

Table 4-13: Zimbabwe Bank Lending Rates from 2009- 2018

Lending	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Nominal Maximum Lending Rate (%)		25.0	58.0	30.0	35.0	35.0	16.0	18.0	18.0	18.0
Individual Average Weighted Lending Rate (%)					14.03	14.4	12.0	10.1	9.4	9.5
Corporate Average Weighted Lending Rate (%)					9.35	9.9	7.6	6.5	7.0	7.4

Source: Reserve Bank of Zimbabwe, 2018

4.2.17 Zimbabwe Public Debt

The Publicly Guaranteed debt for Zimbabwe (USD\$ millions) as at December 2017 is shown in Table 4-14.

Table 4-14: Zimbabwe Public Debt December 2017

Creditors	DOD	Arears	Total	% of GDP
External Debt	3,171	5,652	8,829	40%
Bilateral Creditors	1,443	3,327	4,770	22%
Paris Club	240	2,990	3,230	15%
Non-Paris Club	1,203	336	1,539	7%
Multinational Creditors	1,060	2,262	3,322	15%
World Bank	246	1,174	1,420	6%
Africa Development Bank	37	641	678	3%
European Investment Bank	22	287	309	1%
Afreximbank	622	67	690	3%
Others	133	93	226	1%
Commercial Creditors	674	63	737	3%
Domestic Debt	6,983	149	7,171	32%
Government Bonds	4,785	-	4,785	22%
Reserve Bank of Zimbabwe (RBZ) Loans	2,103	-	2,103	10%
Domestic Arears	-	149	149	1%
Others	94	-	94	0%
Farmers Compensation for Land Improvements ¹	2,4 to 10	-	2,4	11,45%

Source: IMF, 2019

The biggest public debt (40% of GDP) is owed to the country's external creditors. Higher foreign debt resulted in failure to obtain international financing which led to domestic money creation through treasury bills. This act caused 32% of GDP domestic debt. The government of Zimbabwe owes USD\$ 2,4-10 billion to former white farmers who were displaced from their land by the fast-track land reform programme. The compensation to these commercial farmers is for land developments and movable assets appropriated by the new farmers. Farmers Compensation for Land Improvements¹ is not included in the current public debt guaranteed by government although ZWL\$60million was included in the 2019 budget and a USD\$3,5 million agreement between government of Zimbabwe and the displaced farmers. Zimbabwe Debt Sustainability Analysis (DSA) shows that the country is over borrowed to 72% (domestic debt plus foreign debt).

The biggest debt Zimbabwe owes to international community is payable in USD followed by debt to be repaid in eurocurrency as depicted by Figure 4-14.

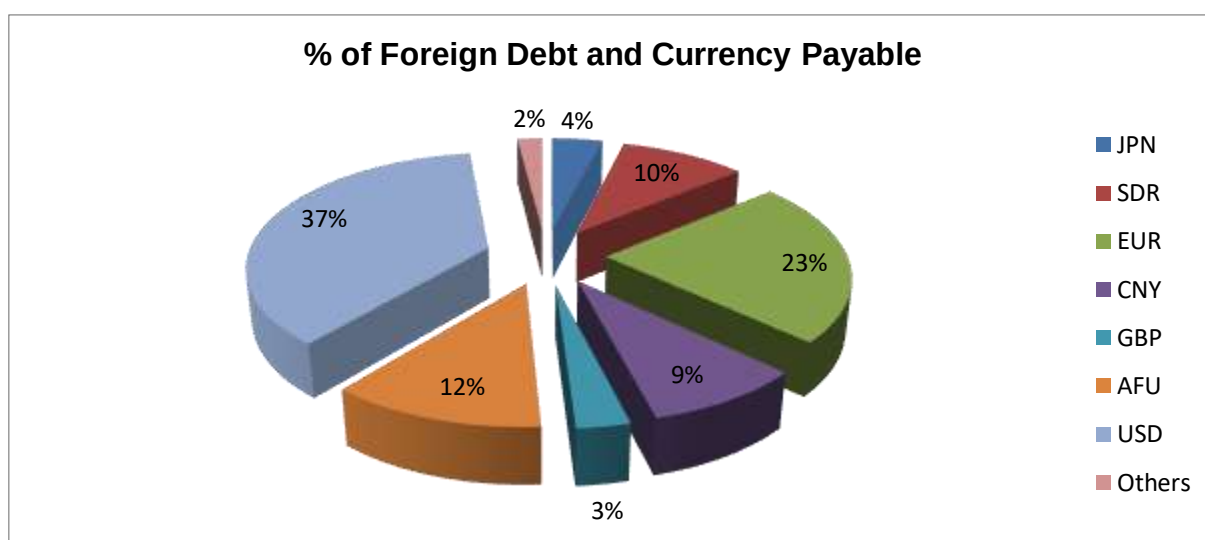


Figure 4-14: Zimbabwe Foreign Debt and Currency Payable

Source: Ministry of Finance, 2018

Foreign debt is owed to World Bank and China. Other countries and international financial institutions owed significantly by Zimbabwe are shown below in Figure 4-15:

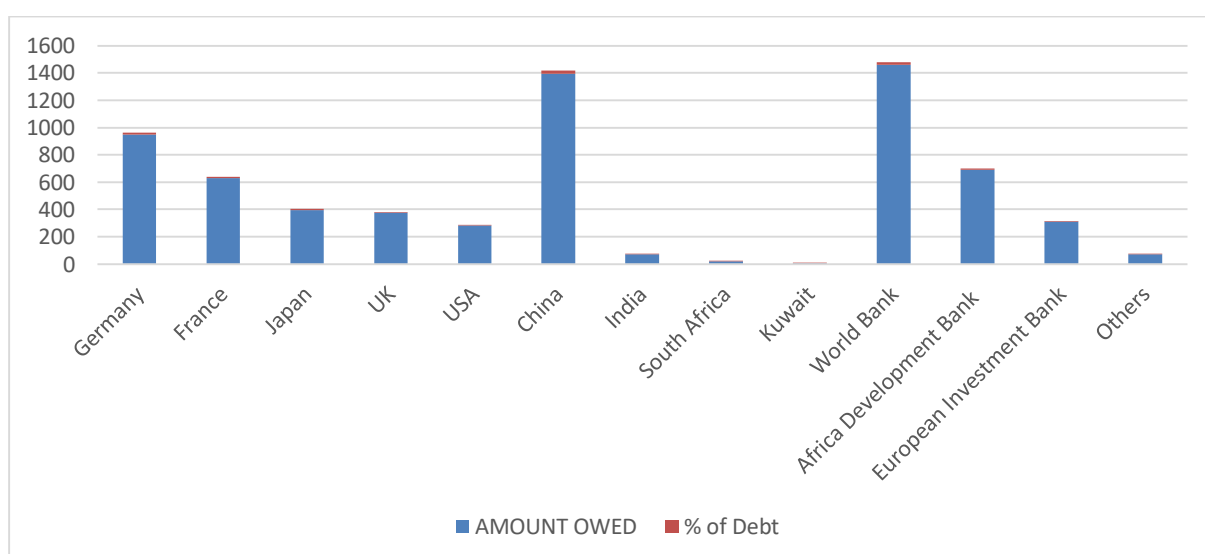


Figure 4-15: Zimbabwe creditors

Source: Ministry of Finance, 2018

4.2.18 Zimbabwe Inflation Analysis

Zimbabwe recorded its ever-highest inflation of 231,000,000% in 2008 due to continuous unsupported seigniorage by government and other quasi fiscal activities. As a result of

hyperinflation, in 2009, the Government of Zimbabwe abandoned the local currency in favour of multiple multi-currency regime that was dominated by the USD\$. The economy stabilised until 2018 when the government reintroduced the local currency. Inflation measured by CPI surged to 521% in 2019 (World Bank, 2020) and is now taken a hyper trajectory and is currently hovering above 837.53% (Zimstat, 2020). This is mainly driven by collapse in local currency which is now trading at 83 to 1\$USD on the local Reserve Bank Currency Auction System introduced on 22 June 2020, a fall in exports and growth of M₃ money supply due to government continued fiscal indiscipline and macroeconomic policy inconsistency (Bloomberg, 2020). The 2020 inflation was further exacerbated and “food prices increased by 725 percent, resulting in a severe loss of purchasing power for the poor.” The black-market rate which is trends invariably above the formal rate has also exerted pressure on prices to skyrocket above the reach of many people in Zimbabwe, (World Bank, 2020). Figure 4-16 displays Zimbabwe inflation trend between 2008-2019.

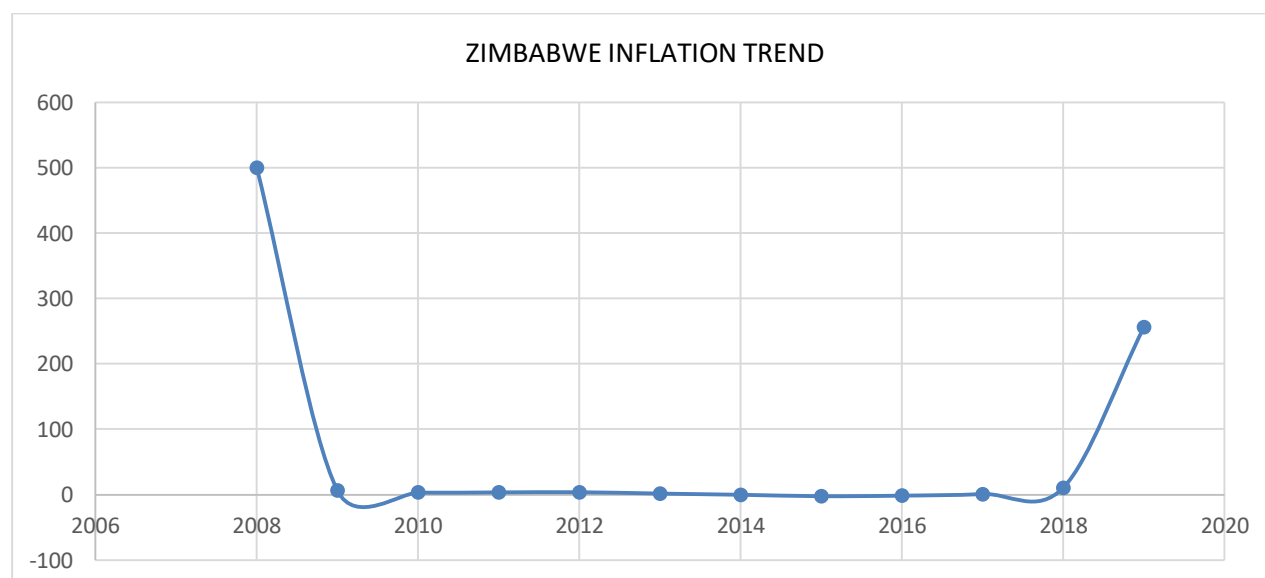


Figure 4-16: Zimbabwe Inflation

Source: World Bank 2020

4.2.19 Credit Creation in Zimbabwe

Broad money supply (M3) grew by over 9 billion between 2009 and 2018 to over 10 billion. Domestic credit, transferable deposits and domestic credit to government through treasury bills issuance were the major drivers of money supply growth. Table 4-14 demonstrates monetary growth in Zimbabwe.

[illegible]

The economy recorded high growth in M3 for the period 2009-2018 and this is attributed to quasi fiscal activities by the government (Pasara & Garidzirai, 2020) which resulted in increased domestic borrowing. The full trend behaviour of the monetary aspects is shown on the line graph in Figure 4-17.

Figure 4-17: The full trend behaviour of the monetary aspects

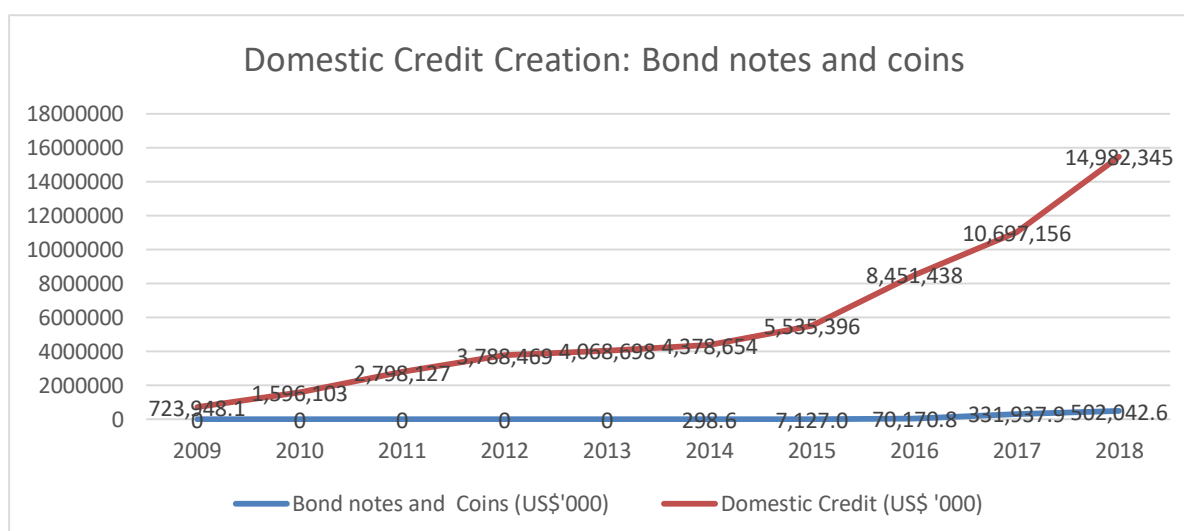


Figure 4-18: Domestic Credit Creation: Bond notes and coins

Source: Reserve Bank of Zimbabwe, 2019

Government started seigniorage from 2014 when bond coins were introduced to replace scarce USD\$ in the market. However, this led to parallel market ballooning and hence inflation Pasara and Garidzirai, (2020). Figure 4-18 depicts credit creation activity in Zimbabwe for the period 2009-2018.

4.2.20 Households Income

From the total households of 3,255,463, the number of households employed in the formal sector was estimated at 3.8% and those on formal retirement pension were 1.8%. About 35% households provide casual labour while food production sales employed 7.8%. Figure 4-19 displays major sources of income for Zimbabwe households.

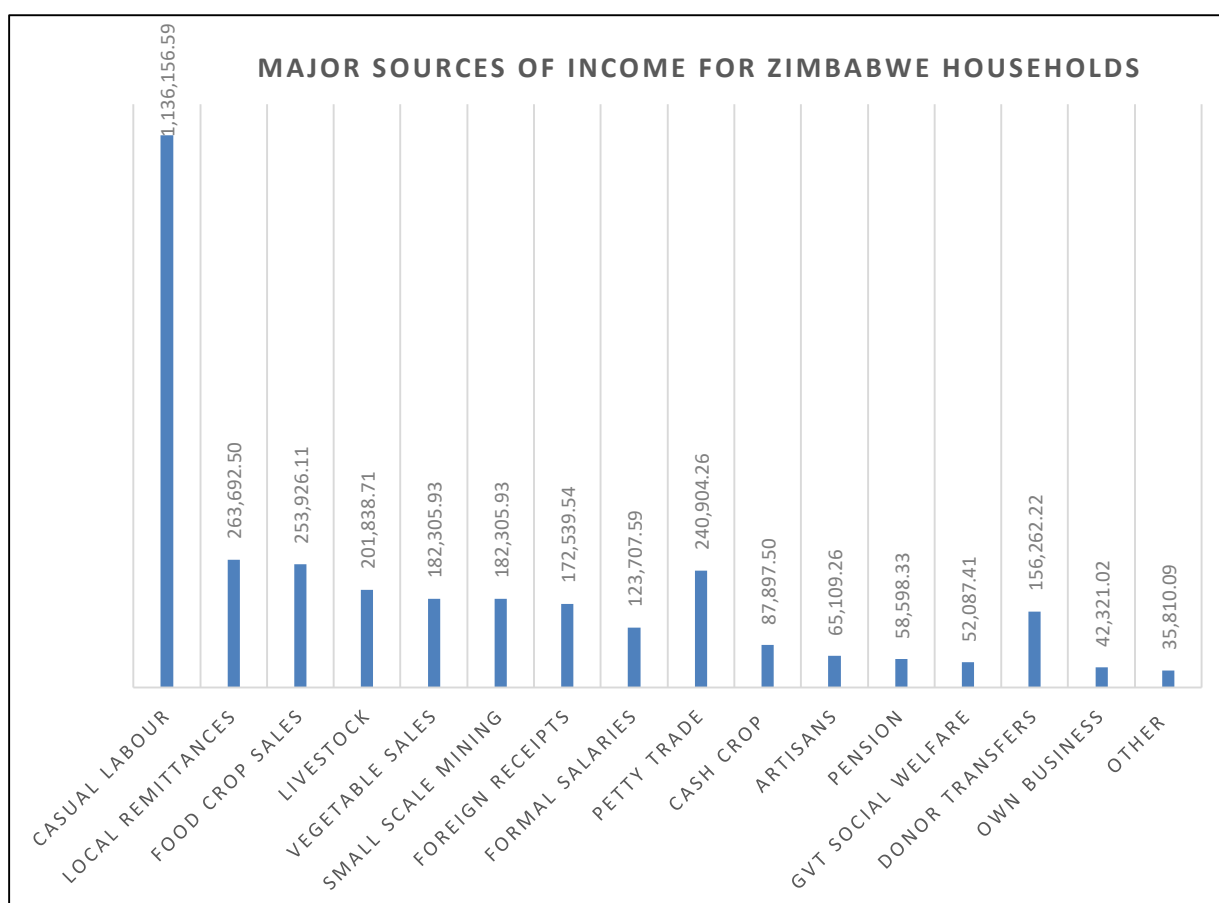


Figure 4-19: Major sources of income for Zimbabwe Households

Source: Zimbabwe Vulnerability Assessment Committee (2017).

4.2.21 Sub-Sahara Africa Population

The outbreak of Covid-19 pandemic in 2020 has increased poverty and uncertainty across the globe and this has reversed the gains and projection on poverty reduction strategies and developmental plans worldwide as the global output contracted by 4.9% (IMF, 2020). The stringent lockdowns, continuous disruptions on economic activity have invariably led to recessions in many economies. Figure 4-20 shows poverty growth rates in Africa. Nonetheless, IMF World Economic Outlook (WEO) projects a 5.5% rebound in 2021 and 4.2% in 2022 which is even higher than achieved growth of 3.9% that was achieved in 2018. In Figure 4-20 the population growth in Sub-Saharan Africa is displayed.

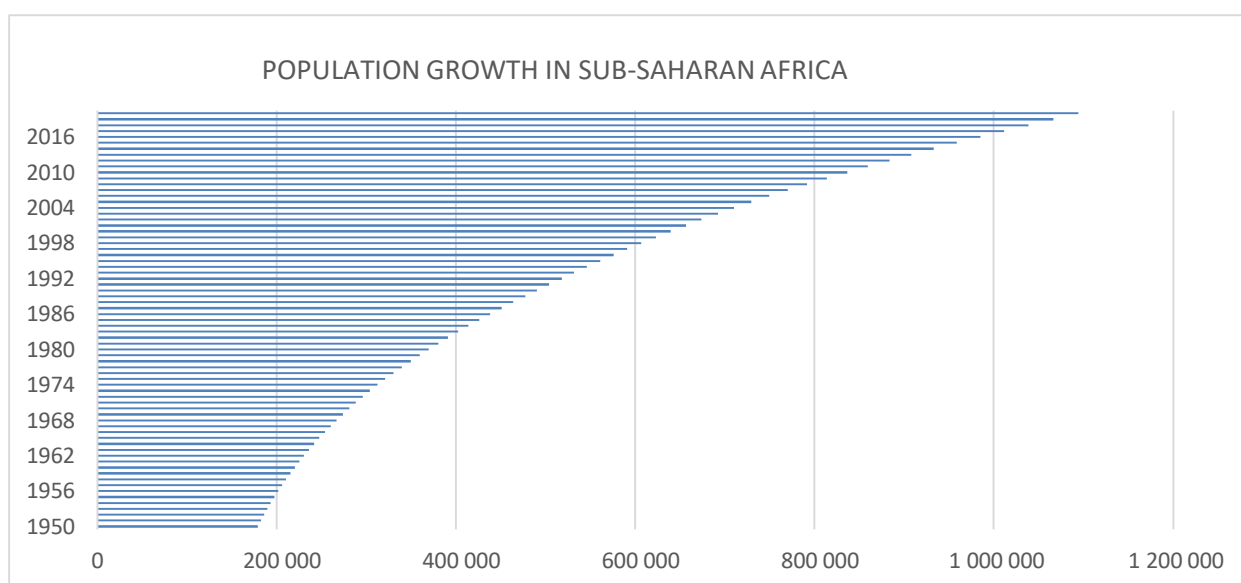


Figure 4-20: Population growth in Sub-Saharan Africa

Source: UN, 2019

The population for Sub-Saharan Africa population has grown to 1,1 billion in 2019 from 179 million and the current population is 14% of the global figure and 79% of Africa's total population. The total population for Africa is estimated at 1,337,666,440.00 in 2020 (ADB, 2019). The country distribution of the population is shown Figure 4-21.

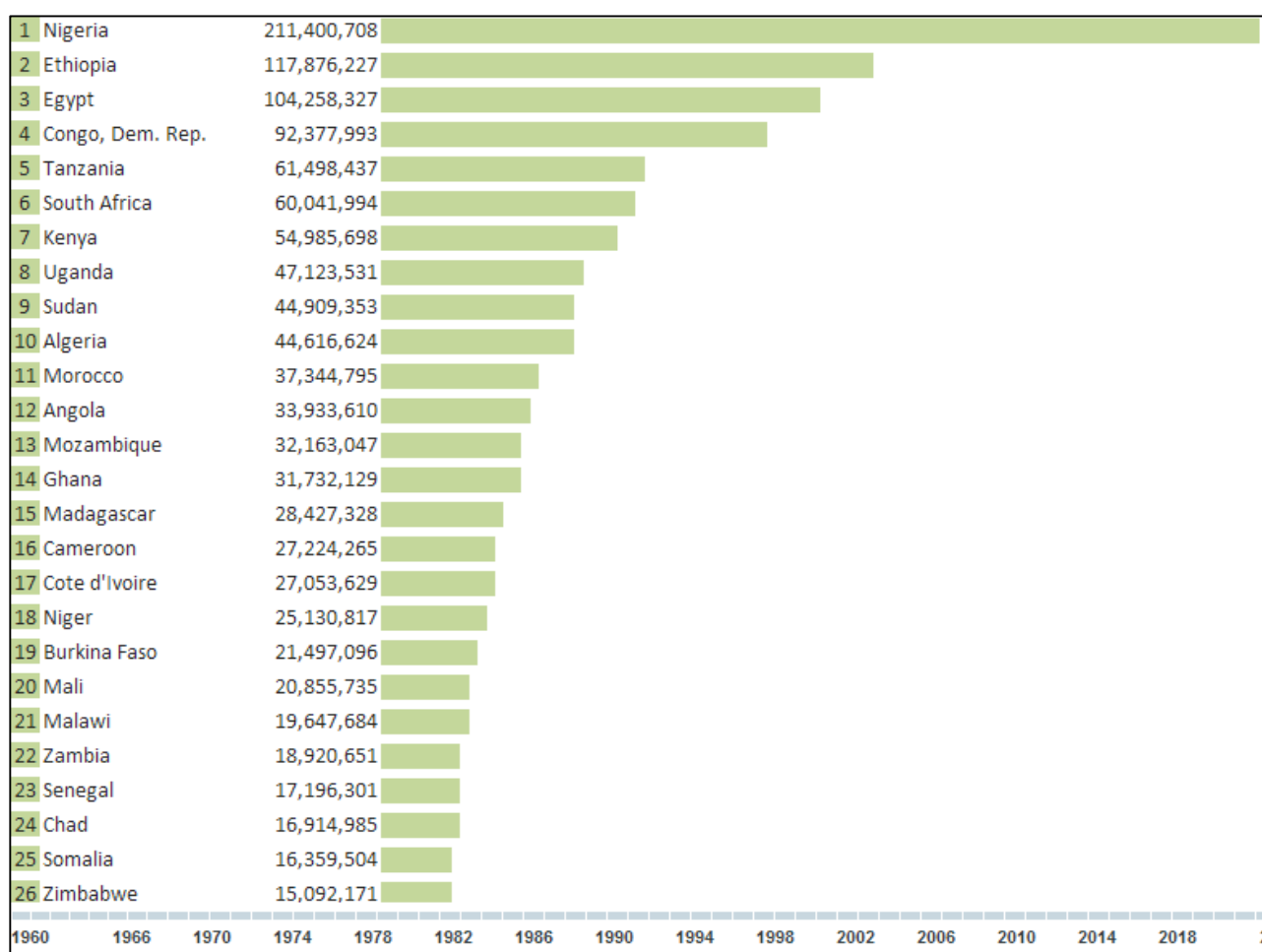


Figure 4-21: Zimbabwe and selected Sub-Saharan Africa countries population 1960-2020

Source: UN, 2019

In Figure 4-21, the population in Sub-Saharan countries is displayed. Nigeria has experienced its highest population growth, estimated that it has 211.4million people. Ethiopia and Egypt are the second and third respectively in terms of population figures.

4.2.22 Africa Population Distribution by Age

Most people in Africa are youth below the age of 50 years. Youthful population indicates an active population which can be employed to enhance production. Figure 4-22 portrays Africa's population distribution by age between 2010- 2021.

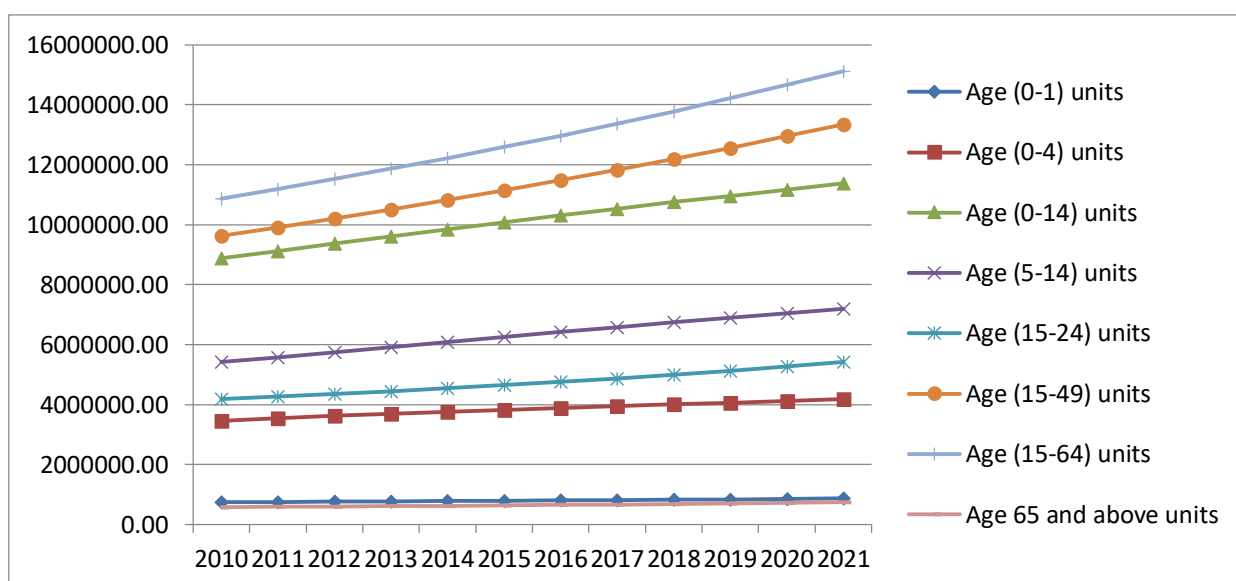


Figure 4-22: Africa Population Distribution by Age

Source: UN, 2019

4.2.23 Regional Inflation

Regional inflation has had a complex trajectory. Figure 4-23 highlights SADC region inflation for period between 2017-2018. It can be seen from Figure 4-23 that Zimbabwe inflation has been rising since June 2017 from 0.3% to 2.9% in 2018 June. Inflation in Mozambique dropped from 18.1% in June 2017 to 4.4% in June 2018. Malawi inflation fell from 11.3% in June 2017 to 8.6% by June 2018.

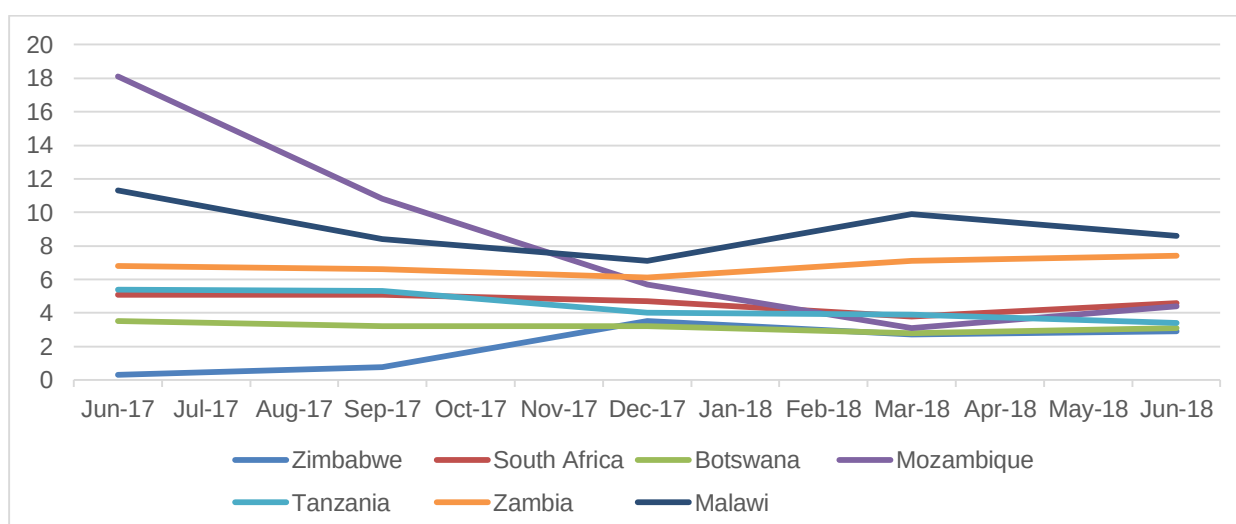


Figure 4-23: SADC region inflation 2017-2018

Source: ADB, 2019

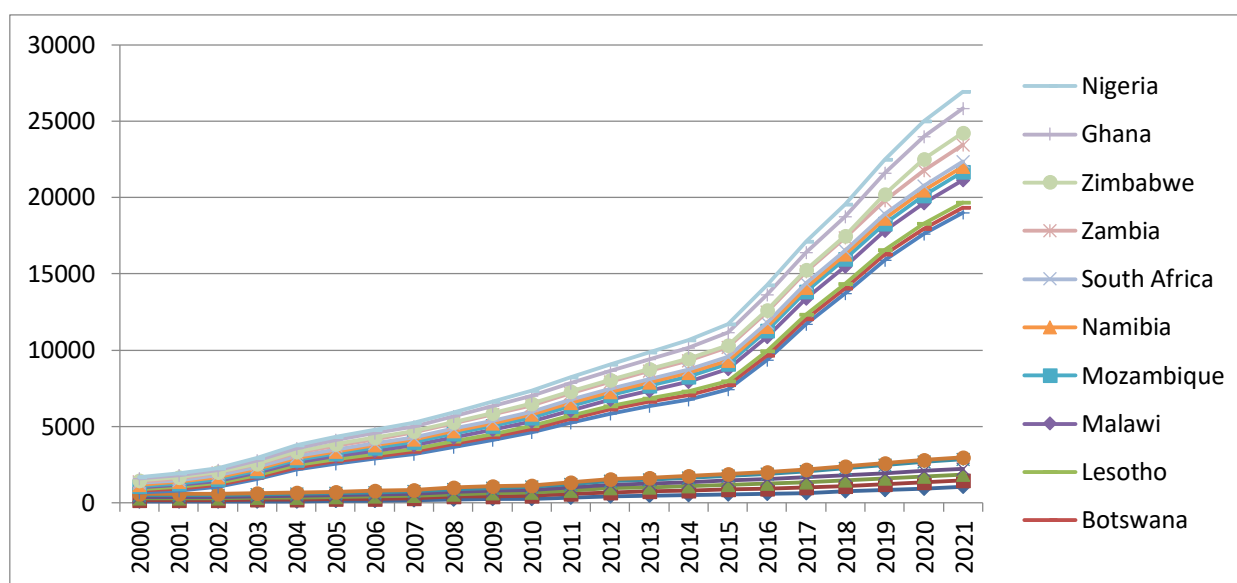


Figure 4-24: Consumer Price Index (Year 2000=100)

Source: ADB, 2019

The graph in Figure 2-24 shows that consumer price index is rising mostly in Nigeria and Zimbabwe. In Zimbabwe the trend is attributed to worsening of the macroeconomic environment and collapse of the local ZW currency.

4.2.24 Actual and predicted World GDP growth rate

In the second quarter of 2020 all economies realised negative growth rates as a result of COVID-19 pandemic outbreak. The most affected are the developed economies. Except for China which recorded positive output in 2020, it is still predicted that most economies will remain restricted by the pandemic until the first quarter of 2021. Table 4-15 shows actual and predicted World GDP growth rate for period from 2018-2021.

Table 4-15: Actual and predicted World GDP growth rate 2018-2021

Country/Group	2018	2019	2020 *	2021*
Advanced Economies	3.6	2.9	-4.4	5.2
US	2.2	1.7	-5.8	3.9
EU	1.9	1.3	-8.3	5.2
UK	1.3	1.4	-9.8	5.9
Other Advanced Economies Excluding G7 Countries	2.7	1.7	-3.8	3.6
Emerging and Developing Countries including Africa	4.5	3.7	-3.3	6.0
Emerging and Developing Countries Asia	6.3	5.5	-1.7	8.0
China	6.7	6.1	1.9	8.2

Country/Group	2018	2019	2020 *	2021*
India	6.1	4.2	-10.3	8.8
Emerging and Developing Europe	3.2	2.1	-4.6	3.9

Source: Government of Zimbabwe 2020 Budget Statement & IMF World Economic Outlook. * Projection

From the table above, India had the largest drop in output in 2020, followed by EU and UK respectively. While it is projected that most economies will have positive output growth in 2021, it is estimated that India will have the largest output rebound in 2021 followed by China and emerging economies in Asia respectively. However, IMF says that world output recovery 'may lose momentum' due to a surge in COVID-19 from the second wave which has been singled out as a new variant of COVID-19. This is despite positive advancements in COVID-19 vaccination. It is now estimated that world growth 'path will remain unpredictable, difficult and prone to setbacks' in the new surge and new variant of COVID-19 (IMF, 2020). Table 4-16 shows global, regional and country COVID-19 confirmed cases in 2020 of the first COVID variant.

4.2.25 COVID-19 Pandemic across the globe

Table 4-16: Global, Regional and Country COVID-19 Confirmed Cases

Region/ Country	Confirmed COVID-19 cases
Africa	1,919,903
Europe	26,713,396
America	35,859,645
South East Asia	12,023,186
Western Pacific	1,105,549
Russia	3,212,673
Zimbabwe	13,869
Total World COVID-19 Cases	82,579,786

Source: WHO, 2019

The global confirmed positive cases of COVID-19 are at 82,579,786 and 1,818,849 confirmed deaths as at 3 January 2021. Of the total confirmed cases, 616,069 are new reported cases as at 3 January 2021. Despite Africa having the lowest positive cases, there is a sudden and rapid surge in cases, mostly in South Africa which accounts for 1,057,561 of confirmed infections (55.08%). It is also noted that Zimbabwe has 13,869 positive cases of COVID-19 and 363 deaths officially reported mostly from local community transmissions (WHO, 2021) and its proximity to South Africa which is the epicentre of COVID-19 in Africa can only be speculated in respect of transmissions and infections.

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4.2.26 World Commodities Analysis

World commodities have largely taken a negative trajectory since the start of 2020 and this is attributed to the COVID-19 pandemic effect on world production and markets. Figure 2-25 shows quarterly World Commodities performance between 2019-2020.

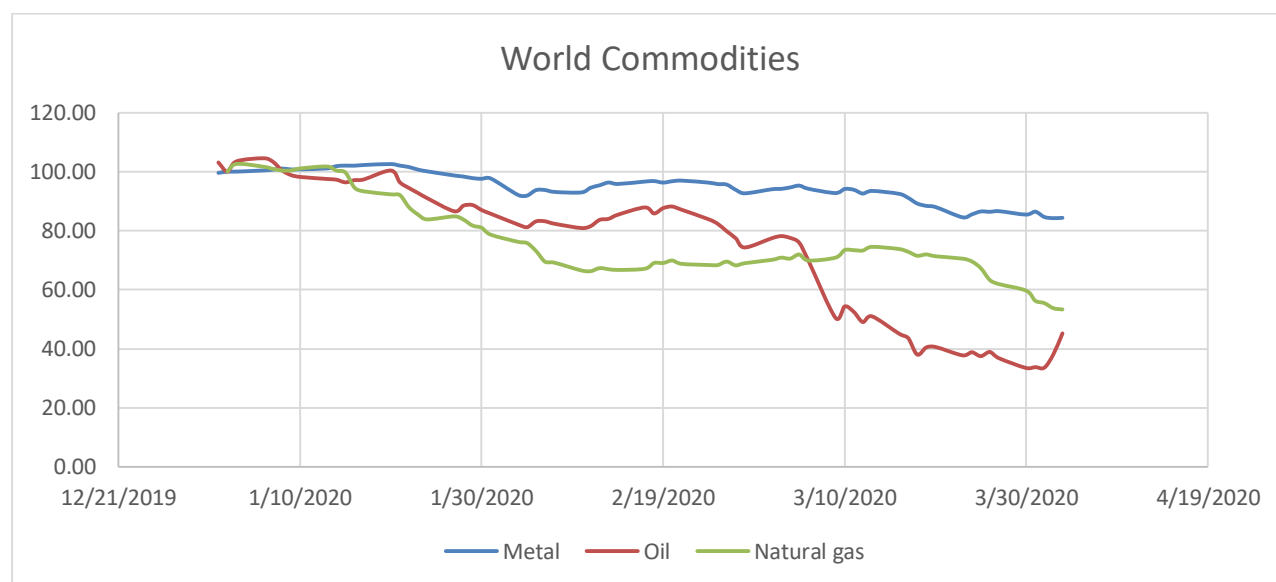


Figure 4-25: World Commodities

Source: IMF, 2020

World commodities outputs have decreased since December 2019 and are expected to remain subdued due to Covid-19 pandemic restrictions. Figure 4-26 displays World GDP from 1990-2021.



Figure 4-26: World GDP from 1990-2021

Source; IMF, 2020

The biggest fall in global GDP was recorded in the last quarter of 2019 to 2020. The other notable World GDP fall was recorded in 2008- 2009 and this was attributed to the global financial crisis.

Table 4-17: COVID-19 reversed achieved and projected growth rates

Period	Advanced Economies	Emerging Market and Developing Economies
2019: Q1	100.00	100.00
2019: Q2	100.40	101.40
2019: Q3	100.80	102.20
2019: Q4	100.90	102.90
2020: Q1	99.20	97.10
2020: Q2	88.90	98.00
2020: Q3	93.80	103.00
2020: Q4	95.70	104.90
2021: Q1	97.00	106.50
2021: Q2	98.20	107.50
2021: Q3	99.10	109.00
2021: Q4	99.90	110.20

Source: IMF, 2020

Table 4-18 shows that COVID-19 reversed previous growth predictions on world growth and it is expected that all countries will enter into recession in 2020. Growth is expected in some economies from 2021 onwards.

4.2.27 International Commodity Prices

Table 4-18: International Commodity Prices USD\$

Resource	2018	2019	2020	2021	2022
Energy	87	76	45	54	57
Agriculture	85	82	78	79	81
Beverages	79	76	72	74	75
Food	90	87	87	88	90
Oils & Meals	85	77	78	80	82
Grains	89	89	88	89	91
Raw Materials	81	78	77	79	80
Fertilizers	82	81	73	76	78
Metals and Minerals	83	78	68	71	73
Base Metals	91	82	70	74	76
Precious Metals	97	105	119	119	118

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Source: World Bank Commodity Markets Outlook, April 2019; Pink Data Sheet, October 2019

Table 4-19 shows that international commodity prices are expected to rise. The average energy prices are expected to rise between 2021 and 2022. World food prices are expected to increase insignificantly while precious metals prices will remain unchanged. Agriculture prices and oils and meals are expected to increase to reflect the increase in demand for agricultural products. The international debt by region shown in Figure 4-27 highlights percentage of debt to GDP. The analysis is important as it identifies which region represents countries over-borrowed. Such countries have current commitments to debt and interest rates payments. Although not all debt is an indication of poor performance, it helps explain how current resources are deployed within the financial year.

4.2.28 World International Debt

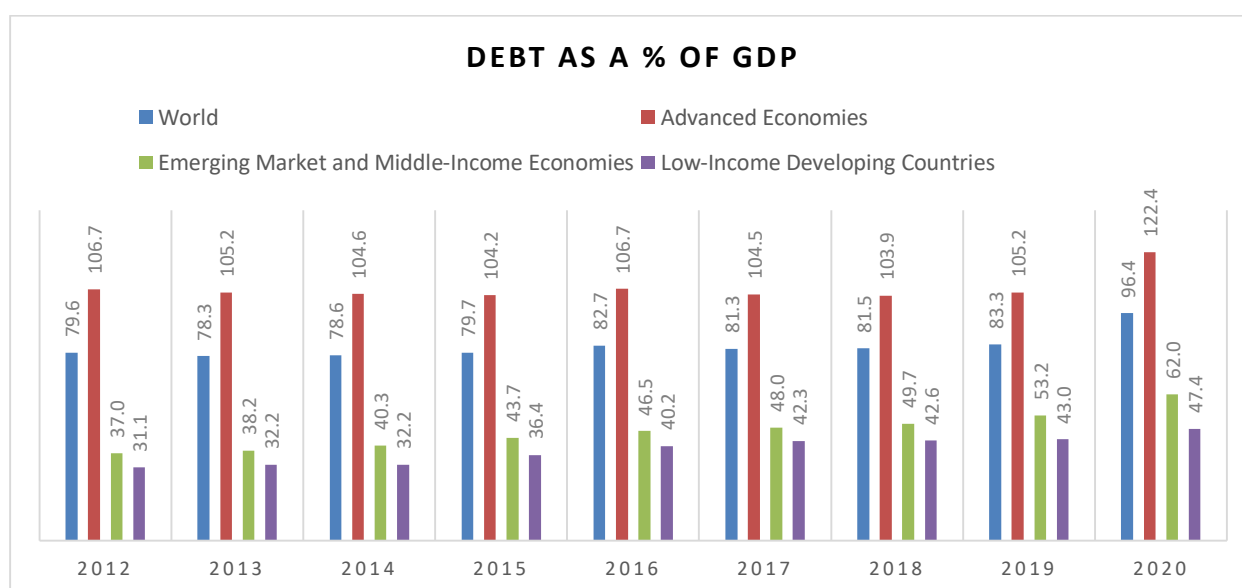


Figure 4-27: DEBT as a % of GDP

Source: UN, 2019

Information in Figure 4-26 shows that world poverty has been falling across the globe, but remains obstinately high in Africa followed by South Asia (UN, 2019 & OPHI & UNDP, 2019:8-12). There are currently 1.3 billion (23.1%) people across 101 countries where 50% are children below 18 years and these experiences multidimensional poverty (OPHI & UNDP, 2019:1-3). In 2019, a little over 10% (734m) of world population lived on less than USD\$1.90 a day and this indicates a massive improvement from 36% (1,9billion) reported in the 1990s (World Bank, 2020). The decline in world poverty has been noticed in other regions except in Africa and

fragile and conflict affected situation (FCS) economies which recorded an increase in poverty. FCS economies have 500 million people and poverty is rife at about 40% head count, while 57.5% of Sub Saharans face multidimensional poverty and poverty incidence as much as to 96%. The COVID pandemic is also expected to push more people deeper into poverty and reverse previous poverty gains as people living below USD\$3.20 a day could increase by 23%. Most of the world poor are rural dwellers, people primarily employed in the agriculture sector and people below the age of 18 years. Poverty is undesirable; more so in children as it affects their cognitive development (Duncanson *et al.* 2019).

Poverty in Africa has increased from 15% that was reported in the 1990s to 86% being reported now in 2020 while OPHI & UNDP found that multidimensional poverty is at 84.6%. It is also estimated that by the year 2030 when the UN reviews its sustainable development goals (SDGs), Africa would have the poorest people both in absolute and extreme poverty. However, the largest number of poor people reside in Sub Saharan Africa. In Africa, a few countries such as Equatorial Guinea, Gabon, Mauritius and Seychelles have poverty rates below 3%. The rest have disproportionate poverty rates above 70%. African counties such as Angola, Ethiopia and Ghana are projected to meet the SDG goal number 1 (to end poverty in all its forms and dimensions) by 2033. On the other hand, Nigeria and Democratic Republic of Congo have the largest number of poor in extreme global poverty. About 558 million (84.3%) of multidimensional poor of the world live in Sub-Saharan Africa and further estimates indicate that 14 countries in Sub Saharan Africa witnessed an increase in multidimensional poverty rates compared to 2018 rates. Figure 4-28 shows world response to the COVID-19 outbreak by selected countries.

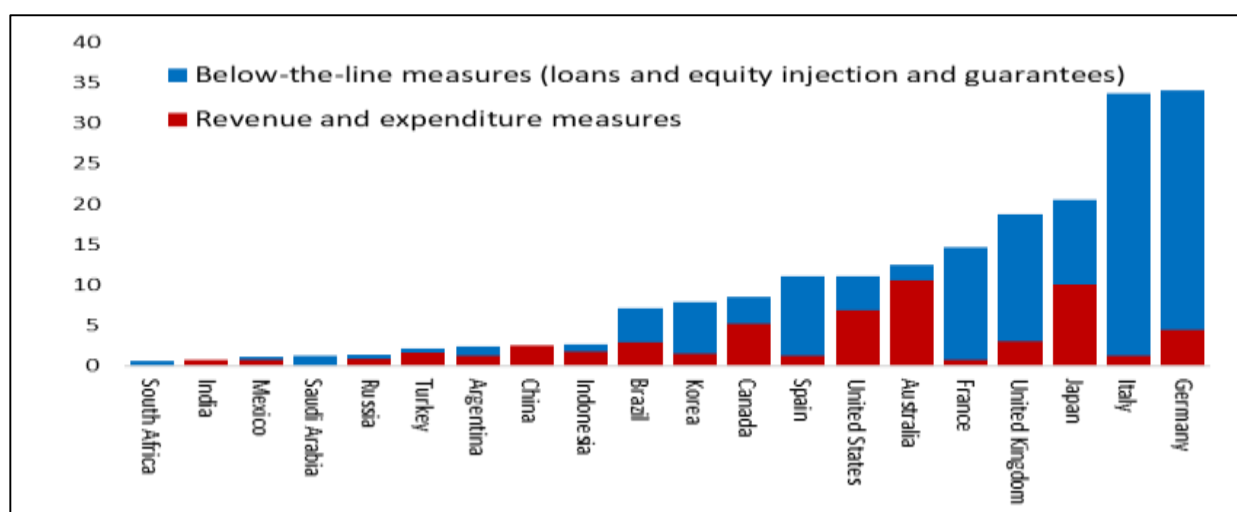


Figure 4-28: Covid-19 World Response

Source: WHO, 2020

4.2.29 Poverty in Africa

Africa has the highest MPI poverty rates globally, reported to be over 93% in some countries. The average poverty faced by the poor in Africa is 44% to 69% for Swaziland and Niger respectively and the most noted contributor to poverty across 33 African countries including Niger, South Africa, Zimbabwe and Mali is living standard variables (ADB, 2019). From statistics presented in Figure 4-15 from ADB, about 50% of households in Africa have recorded least infant mortality while in countries such as Nigeria, Madagascar, Mali, and Burkina Faso at least 30% or more have women or a child is undernourished in their households. In most of Sub-Saharan Africa nations, there is a record 55% school children drop-out or where adults have not attained five-year education hence cannot read and write (Alkire & Santos, 2010). Table 4-20 shows Africa poverty indicators from 2010-2016.

Table 4-19: Africa poverty indicators

Indicator	2010	2011	2012	2013	2014	2015	2016
GNI Per Capita (US\$)	4470	4590	5200	5520	5490	4870	4970
Public Expenditure – on Health (as % of GDP)	3.6	3.8	4.5	5.2	5.2	5.1	5.2
Human Development Index Value (0 to 1)	0.724	0.732	0.737	0.741	0.743	0.745	0.71
Gender Inequality Index, value	0.5	0.5	0.4	0.4	0.4	0.4	0.5
Food Aid in Cereals ('000 MT)	13	11	15	10	5	4	4
Incidence of Tuberculosis (per 100 000)	77	73	73	68	72	75	77
Prevalence of undernourishment (% of pop.)	5.1	5	5	5	5	5	5
Under Five Mortality Rate (per 1 000)	27.3	26.6	26.1	25.8	25.6	25.5	30.2
Crude Birth Rate (per 1 000)	24.6	24.9	24.9	24.7	24.3	23.7	22.9
Crude Death Rate (per 1 000)	5.1	5.1	5.1	5.1	5.1	5.1	5.1

Source: Africa Development Bank, 2019

4.2.30 Poverty in Zimbabwe

From independence in 1980, poverty head count ratio declined to around 26% before it gradually increased in the 1990s to 35% due to incessant droughts and failure of the Economic Structural Adjustment Programme (ESAP), launched in 1991 (World Bank, 2002:1). By 2003, poverty is reported to have surged to 63% across households in Zimbabwe, (Central Statistics Office, 1997a) due to the fast-track land reform programme that targeted approximately 4 600 white commercial farmers. This *jambanja* in Zimbabwean parlance resulted in reduced national agricultural yields that fell by 85.7%, a collapse of the local currency that led to 231,000,000%

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hyperinflation and economic sanctions preferred on Zimbabwe. Zimbabwe was economically isolated by international investors and global lending institutions such as IMF and World Bank. Poverty is now estimated at 88% while Zimstat estimate it at 70.5%, (Zimstat, 2017). The concern is that 29.3% are in extreme poverty. The international poverty rate for Zimbabwe is estimated at 21.5% while the poverty Gini index was estimated at 43.2% (World Bank, 2020).

Zimstat conducted Poverty Income Consumption and Expenditure Surveys in 2017 and found that 70.5% of households across Zimbabwe are living in poverty. The food poverty line (FPL) for Zimbabwe was estimated at an average of USD\$ 31.2 while urban FPL was USD\$31.7 and rural FPL was 30.5 (Zimstat, 2017:36-38).

It is reported that Zimbabwe poverty is so severe such that 59% of rural population require emergency food aid for the period 2019-2021 (Zimbabwe Vulnerability Assessment Committee (ZimVAC, 2019). Similar reports show that 60.6 households had per capita consumption below the poverty line (ZimVAC, 2019). Separately, UN World Food Programme (WFP) estimates that Zimbabwe requires USD4 204 million emergency assistance for 2021 to feed 4 million in poverty in both rural and urban cities. It also predicts that 6.9 million Zimbabwean in both rural and urban areas face insurmountable food poverty risk and require assistance (UNWFP, 2021; Southern Africa Social Protection Experts network, 2021). The TCPL for Zimbabwe was estimated at 70.5% in 2017 (Zimstat, 2017:38). Table 4-21 shows TCPL in 2017.

Table 4-20: Total Consumption Poverty Line for Zimbabwe

Poverty Line	Average	TCPL (A+B)
Food Poverty Line (A)	USD\$31.27	
Non-Food Poverty Line (B)	USD\$39.09	70.36

Source (Zimstat, 2017)

The Gini coefficient which measures distribution of wellbeing was 0.45 for Zimbabwe. Extreme poverty increased from 22.5% to 29.3 for 2012 to 2017 and this because of an increase in individual poverty from 30.4% to 40.9% (Zimstat, 2017:19). Urban poverty is rising faster than rural poverty according to Zimstat (2017). The Gini coefficient shows that wellbeing is not equally distributed in Zimbabwe. Key poverty indicators of poverty in Zimbabwe are analysed in Table 4-22 below:

Table 4-21: Zimbabwe poverty indicators

Poverty Indicator	2018	2019	2020	2021
Life expectancy at birth, total (years)	61.19	61.49	61.738	61.965
Dependency ratio, Total	82.9	82.2	81.52	79.785
Birth rate, crude (per 1,000 people)	30.67	29.74	28.97	28.36
Death rate, crude (per 1,000 people)	7.883	7.773	7.692	7.626
Mortality rate, under-5 (per 1,000)	46.22	45.62	47.23	43.29
Fertility rate, total (births per woman)	3.615	3.531	3.46	3.398

Source (Zimstat, 2017)

UNDP (2020) reported that life expectancy at birth for female was 62.2% while for male it is 59.5% in 2018. It also reported that infant mortality rate per 1000 was 36.5%. Tuberculosis was reported to be 220 per 100 000 in 2018 while child malnutrition was 27.1% (UNDP, 2020). The information is highlighted in Table 4-22:

Table 4-22: Health Indicators

Health Variable Indicator	Value
Life expectancy female	62.2%
Life expectancy male	59.5%
HIV prevalence (15-49 years)	13.3%
Malaria risk (national)	95.2%
Tuberculosis per 100 000	221
Adult mortality female per 1000	300
Adult mortality male per 1000	362
Mortality rate for children below 5 years per 1000	50.3

Source: Zimstat, 2017

Poverty trends between rural and urban are important aspects that call for analysis because circumstances of poverty between the two are not similar. Table 4-24 shows comparison of Zimbabwe rural and urban poverty using PICES and ICES.

Table 4-23: Zimbabwe Rural and Urban Poverty Trends

PICES & ICES	Poverty	Extreme poverty	Poverty gap index	Poverty severity index
PICES 2017				
Rural	86.0	40.9	43.5	25.4
Urban	37.0	4.4	11.3	4.8
All Zimbabwe	70.5	29.3	33.3	18.9

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PICES & ICES	Poverty	Extreme poverty	Poverty gap index	Poverty severity index
PICES 2012				
Rural	84.3	30.4	42.8	25.4
Urban	46.5	5.6	15.5	7.2
All Zimbabwe	72.3	22.5	34.1	19.6
ICES 2001				
Rural	82.4	52.4	43.4	27.0
Urban	42.3	14.5	15.5	7.6
All Zimbabwe	70.9	41.5	35.4	21.4
ICES 1995				
Rural	86.4	62.8	47.1	29.6
Urban	53.4	15.0	20.2	10.0
All Zimbabwe	75.6	47.2	38.3	23.2

Source: (Zimstat, 2017)

4.2.31 Inequality in Zimbabwe

The adjusted inequality HDI (IHDI) has a value of 0.435, indicating very high inequality in the country. Zimbabwe has serious income inequality (43.2%) (UNDP, 2020). High income inequality signifies the existence of two distinct classes of income (poorest and the richest). Table 4-24 below indicates various inequalities existing in Zimbabwe.

Table 4-24: Zimbabwe Inequality indicators

Inequality indicator	Value of Indicator
Inequality adjusted HDI (IHDI)	0.435
Coefficient of human inequality	22.7
Income inequality, Gini coefficient	43.2
Income shares of the poorest (40%)	15.3
Education inequality%	16.8
Life expectancy inequality	24.2

Source: UNDP, 2020

Zimbabwe poverty measured in extreme poverty, poverty gap index and poverty severity index has remained largely high since 1995. A meaningful drop was witnessed on extreme poverty in 2012 before it went up again in 2017.

Figure 4-29 shows that poverty remains extremely high in Zimbabwe for the period 1995-2017. However, extreme poverty and poverty gap slightly reduced during the same period under review.

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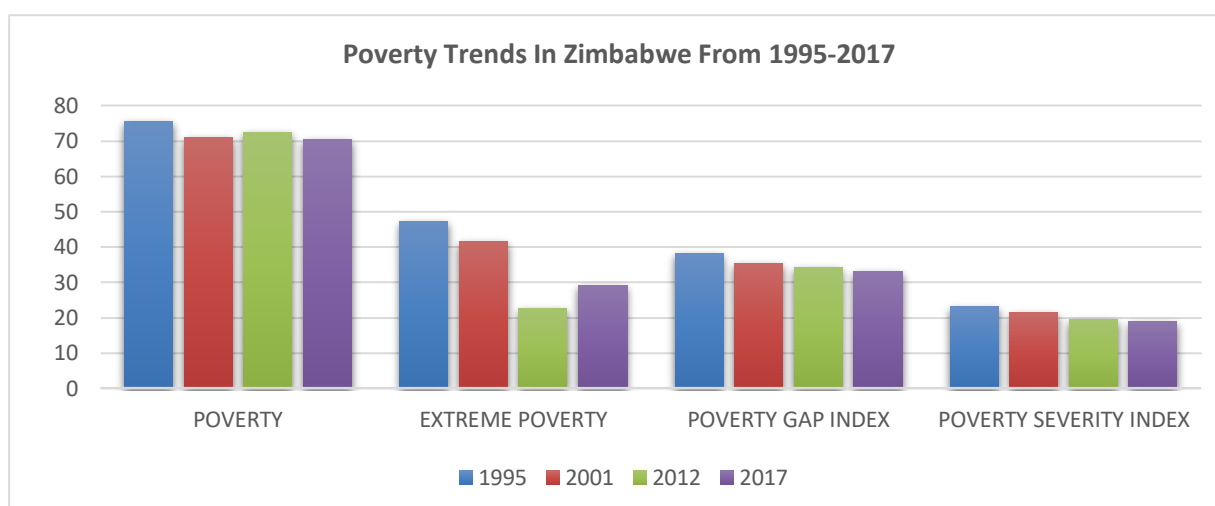


Figure 4-29: Poverty trends in Zimbabwe from 1995-2017

Source: (Zimstat, 2017)

4.2.32 Poverty severity and distribution in Zimbabwe

There is higher poverty in rural based provinces and less poverty in urban based provinces. Generally, Bulawayo and Harare have the lowest poverty compared to other provinces in Zimbabwe. Table 4-26 shows poverty severity and distribution in Zimbabwe.

Table 4-25: Poverty severity and distribution in Zimbabwe by Province

Province	PREVALENCE (%) OF			POVERTY INDICES	
	Percent Poor people	Poor people	Very poor people r	Poverty gap index	Poverty severity index
Manicaland	16.4	80.7	36.9	40.0	23.0
Mashonaland Central	12.0	87.9	49.5	47.9	29.4
Mashonaland East	12.2	75.8	29.9	35.5	19.9
Mashonaland West	12.6	78.7	38.7	39.9	23.9
Matabeleland North	6.5	85.3	45.1	44.6	26.6
Matabeleland South	5.7	76.9	27.3	34.3	18.5
Midlands	11.8	73.8	30.2	34.9	19.7
Masvingo	13.3	75.0	27.9	34.0	18.5
Bulawayo	2.2	29.9	1.3	7.1	2.4
Harare Province	7.3	37.3	5.2	12.2	5.3
All Zimbabwe	100.0	70.5	29.3	33.3	18.9

Source: Zimstat, 2017:41

The tables above show that 29.3% of people in Zimbabwe are very poor while 70.5% are poor people. Mashonaland Central has the highest number of poor people at 87.9%; it is also the province with the highest very poor people.

4.3 CONCLUSION

This chapter analysed major economic sectors of Zimbabwe, Africa and World to determine the output growth rates from time to time. Zimbabwe has witnessed massive growth rates in some sectors such as agriculture and distribution while some sectors such as financial services have remained below expectations. Zimbabwe has the highest literacy rate in Sub Sahara but it has very high unemployment. The growth expectations for Zimbabwe, Africa region and the world have been strongly affected by the COVID-19 pandemic since 2019.

CHAPTER 5: RESEARCH DESIGN AND METHODOLOGY FOR THE DEVELOPMENT OF A NEW MULTIDIMENSIONAL POVERTY MEASURE FOR HARARE PROVINCE

5.1 INTRODUCTION

This chapter is mainly focused on developing a research design that is adopted for the study, systematic data collection methods used, data sources and economic results modelling techniques employed to analyse the data in order to meet the objectives of the study. Research methodology is defined as a technique applied to systematically resolve the research question (Kumar, 2008:5). It is a scientific way for predicting a phenomenon formulated by the researchers in order to show how the research outcomes were achieved (Rajasekar *et al.* 2006). Schwardt, 2007:194-195) explains research methodology as a theory developed to guide the research problem investigated. According to online Cambridge English Corpus Dictionary (2020) research is “a detailed study of a subject, especially in order to discover (new) information or reach a (new) understanding.”

5.2 RESEARCH DESIGN

Research design refers to research methods and procedures employed to obtain, investigate and predict variables related to a specific research question. Research design “provides a detailed outline of how an investigation is carried out” (Alavi *et al.* 2018). In a similar context, research design is a plan of action for the study (Leedy, 1997:94-196). Research design enables transfer of “theory into practice through development of critical perspective and knowledge” (Chon & Sim, 2019:40) enabling identification of the study type and of the research problem under analysis. A study could be descriptive (case study, survey and naturalistic observations), meta-analytic, correlation (case control study), reviews or experimental (experiments). This study adopts quantitative research design and questionnaires were used to collect, measure and analyse data from observations across the city of Harare. Data was collected from wards which were grouped into four locations; Harare rural, high density, medium density and low density. The decision to use quantitative design and not qualitative research design is proffered in section 5.2.2.

5.2.1 Descriptive Research Design

Descriptive research design was adopted in this study. Descriptive research design is a scientific research investigation technique in which elements are analysed and described without manipulation. The elements studied do not experience any exogenous disturbances during data collection. Descriptive research is a form of non-experimental study aimed at describing the phenomenon in question in situ (Schwarzkopf, 2008). McNabb (2002) advises that descriptive research method is useful to researchers as it enables them to explain the characteristics of the entire population to which the sample of the study belong. For instance, pertinent questions which can be gathered from the population by using research design are who, how and when. Descriptive design was to explain circumstantial poverty, household poverty and durational urban poverty in the case of Harare province. The aim was to develop a multidimensional poverty measure by adapting the UNDP MPI. The descriptive research design provides reliable and scientifically valid representation of poverty dimensions and indicators (Van Wyk, 2012). The approach generated quantitative data from primary sources and accurate conclusions and recommendations are drawn from the sample for generalisation to the entire population.

The first aspect in this chapter is adopting the UNDP MPI measure and developing a new MPI poverty for Harare province using more dimensions, indicators and cut-offs. The study then performs logistic regression to analyse the MPI developed. The other tasks entail durational modelling and perceptions of poverty using logistic regression.

5.2.2 Quantitative Research Design

This quantitative utilises a mathematical and statistical approach to explain data collected numerically (Aliaga & Gunderson, 2006). Quantitative methodology is pragmatist and positivistic in enabling the study to test standing theory in order to augment knowledge, intuition and interpretation (Myers, 2013). Quantitative research uses surveys and questionnaires, giving the researchers personal involvement and partiality (insider's point of view) of participants without influencing the outcome (Castellan, 2010), of circumstantial and durational poverty.

Creswell (2013) states that quantitative research is an important cognitive orientated framework applied to investigate and test relationships of variables. Quantitative research data is ordinarily presented and analysed using statistical, tables and graphs providing a broader scope for deductive reasoning (Van Wyk, 2012). Deductive reasoning attribute of quantitative research

explains causality relationships, extrapolations about a variable over time and significance analysis (Hayes, 2012).

In order to answer the research questions, the study used the following sampling design process proposed by Malhotra (2010:372): determination of target population, specification of sampling frame, specification of sampling technique, determination of sample size and execution of sampling process. The flow processes of the sampling design are highlighted diagrammatically in Figure 5-1.

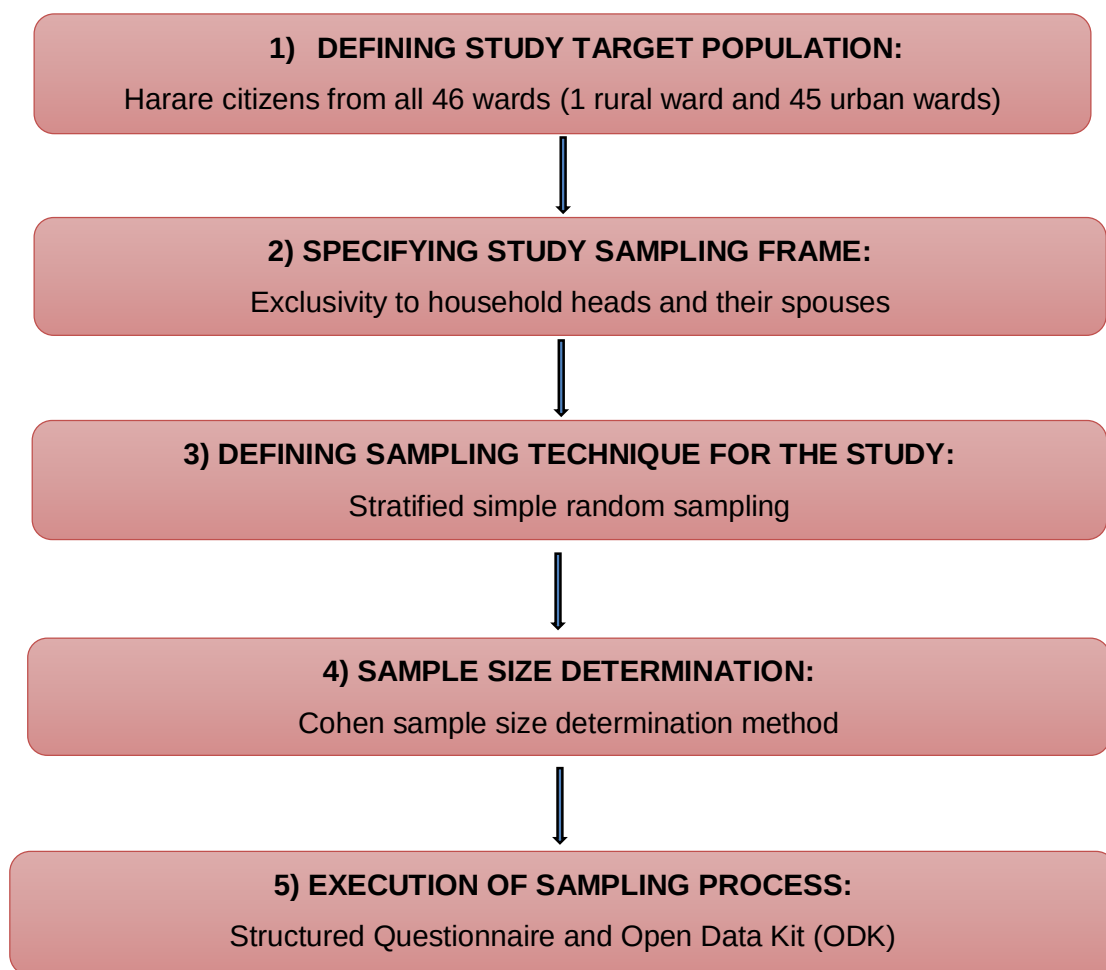


Figure 5-1: Study sampling design process and specification

Source: Malhotra (2010: 370-374) and Researcher's own specific study design features

Quantitative research design has also been chosen ahead of qualitative research because it will enable the study to apply mathematical and statistical aspects on the data to accurately generalize poverty for the entire city of Harare and Zimbabwe as well. It has also been noted (Daniel, 2016:92-93) that quantitative research enables researcher detachment which is not

common with qualitative research. The study used questionnaire data collected through Open Data Kit (ODK) survey across all city of Harare locations. Before quantitative research was extended to the sample, a pilot study was undertaken to test efficiency and effectiveness of the research instrument.

Stratified simple random sampling was used to collect data. As provided in section 1.5.3, the province's 46 wards were divided into 4 (stratas) which are Harare rural, high density, medium density and low density. In each location households were chosen (unit of identification) and the total number of households sampled from each location and ward is provided in Annexure A2

5.3 RESEARCH TOOL REFINEMENT: VALIDITY AND RELIABILITY TESTS

Validity and reliability are two critical tools that increase transparency of the study and reduces researcher bias in research (Singh, 2014). Validity and reliability tests strengthen the instrument to deal with measurement errors on theoretical relationships (Forza, 2002; Mohajan, 2017:1). Kimberlin and Winterstein, (2008) add that these tests guarantee quality control and integrity of measurement tools (Mohajan, 2017:1; Singh, 2014). It is necessary note that validity and reliability are perfectly related and there cannot be validity without reliability but reliability can be done without considerations of validity (Weimer, 2007:19).

Drost (2011) defined reliability as “the extent to which measurements are repeatable when different researchers perform the measurement on different occasions, under different conditions, with alternative instruments which measure the construct or skill.” Reliability is the degree of dependability of the research instrument across time. Reliability can be defined as a research measurement that gives consistent results with equal values (Blumberg *et al.* 2005). The study improved these constructs by incorporating derived from the pilot into the main study. The following validity and reliability test were conducted to improve efficiency and effectiveness of the research instrument. The average time spent on each questionnaire decreased to 13 minutes due to the use of ODK and experience of the research assistants and further training they received.

5.3.1 Validity

Weiner (2007) and Mohajan (2017:14) confirm that validity estimates the degree to which research instrument is successful and truthful in explaining what it is designed to measure. Validity eliminates inherent systematic and constant errors of a measurement tool. Validity tests should answer the question does the research tool measure what it is designed to measure?

(Thatcher, 2010) According to Mohajan (2017:15) validity test has two parts: internal validity which highlights credibility of the researcher(s) in selection of sample, precision in recording of results and accuracy in data analysis and external validity which measures transferability of results to other groups or generalisation to the population through inference. Pallant (2011) and Mohajan (2017:15-16) assert that validity is made of 4 tests which are face validity, content validity, criterion validity and concurrent validity. These are discussed in sections that follow.

5.3.1.1 Face validity

Sometimes called expert validity, the test is aimed at investigating whether the questionnaire is measuring its intentions. Face validity checks whether the assembled questions of the research tool seem to be pinpointing the construct. The researcher consulted some experts in the field of poverty research and research promoters who have expertise and familiarity in poverty measurement to evaluate the questions designed for the questionnaire before they were used and their input were formulated into the final questionnaire.

5.3.1.2 Content validity

Content validity pertains to sampling adequacy on content by a measuring instrument. This construct checks completeness of research questions in attending to the research objectives. All research objectives of the study were double checked and it was ascertained that the research tool adequately addressed all study objectives.

5.3.1.3 Criterion validity

This is used to determine the accurateness of a measure and is achieved by making a comparison with a different measure which was established to be valid. In this regard, the researcher applied the study tool in various scenarios in order to determine how predictive was.

5.3.1.4 Concurrent validity

This is a projecting measure on current and future behaviour or performance using set standards or scores. The study used some of the questions from UNDP MPI as well as SDG goals in question form to develop a poverty measure. It should be noted that all questions designed directly relate to SDGs, hence the targets from SDGs were formulated into the tool.

5.3.2 Reliability

Reliability is concerned with consistency, repeatability and dependability (error free) of the results produced by the measurement tool used (Chakrabartty, 2013). This means the ability of the tool to provide similar results when used twice or more. There are 2 basic parts of reliability which are stability of results when test is repeated and internal consistency which determines the ability of the testing tool to give similar results consistently despite changes in elements. The research used the following types of reliability: parallel form reliability, test-re-test reliability and inter-rater reliability and split half reliability.

5.3.2.1 Parallel forms of reliability

Parallel form of reliability is performed when different versions of the questionnaire are tested on the same population. Mohajan (2017:15) concludes that if results from the versions administered on different occasions to the population are correlated, then there is parallel reliability. The study split questions into two sets (A and B). The research tool was tested on research assistants two weeks apart before it was rolled out in the pilot study. Consistent results were obtained confirming parallel forms reliability of the research tool.

5.3.2.2 Test-retest reliability

This reliability measure is used to assess the external consistency of a measure; and this is achieved by giving the same respondents the same test at different periods. The questionnaires were administered 15 days apart as advised by Mohajan (2017:13) that tests should be 2 weeks to 1 month apart. The tests were conducted in Mabelreign and Malbrough districts wards. The results produced true variance score (δ_t^2), $r = 0.88$ when SPSS was used implying external consistency hence, equivalent forms reliability which is above $r = 0.7$ minimum acceptable score means a reliable test.

5.3.2.3 Inter-rater reliability

Inter-rater reliability is the extent to which two or more individuals (coders or raters) agree. Inter-rater reliability addresses the consistency of the implementation of a rating system. The study gave questionnaire samples to two senior lecturers from Midlands State University, Gweru, Zimbabwe, to rate them and produced a rating score of Cronbach's alpha (α) = 0.90. The Cronbach's alpha obtained from the independent raters from Midlands State University indicates internal consistency of the tool. The research tool was also evaluated by both study

promoters Professor Dunga and Professor Redda who independently agreed that the tool was reliable.

5.3.2.4 Split-half reliability

Given the fact that the study tool was long, split-half reliability was inevitable. The entire 10-page questionnaire was split into 2, one section of odd page numbers while the other section was even numbers as recommended by Chakrabartty, (2013); Mohajan, (2017:13). The decision of how to split into odd and even page numbers was the only way that could produce credible results given that the questionnaire assessed measuring circumstantial, durational and perceptions. The results produced similar Cronbach's alpha (α) = 0.96 which confirmed internal reliability of the research instrument.

After the research tool was successfully developed, it was rolled out to pilot study. The pilot helped with further refinement discussed in the next section of this chapter.

5.4 PILOT STUDY

Polit *et al.* (2001) conclude that "pilot study is a small-scale version or trial run in preparation for major study which is used to pre-test or try out research instrument." The pilot questionnaire reduced data collection errors, reduced logistical glitches and determined if the statistical and analytical processes and framework were efficacious.

Conscious to the need to improve usefulness of the study by refining the research tool before the main study, a pilot questionnaire was administered across locations (Harare rural, high density, medium density and low density) wards at 11.4% of the sample size. Baker (1994) advise that a pilot study should be between 10-20% of sample size. The pilot study was done in high density location (Kuwadzana, Mbare and Glen View), low density location (Westgate and Marlborough) and rural location (Hopley area). A total of 47 households presenting 11.4% of the sample size were covered in 2 days. Pilot study was done as follows: 14 household samples from high density wards, 6 medium density households, 15 in low density households and 12 in Harare rural households).

Developed real time data collection framework, data server suitability to handle and process large data instantly and astuteness of analysis to economic theory were fully tested during pilot study. The pilot study also improved validity and reliability of the study by limiting ambiguity and incorrectly structuring of questions before actual questionnaire is administered (Baker, 1994; Polit *et al.* 2000). The pilot study enabled study to refine the questionnaire by (a) adding new

questions (b) rephrasing questions (c) understanding inevitable challenges anticipated in the study and (d) proffering solutions to the changes as presented diagrammatically in Figure 5-2.

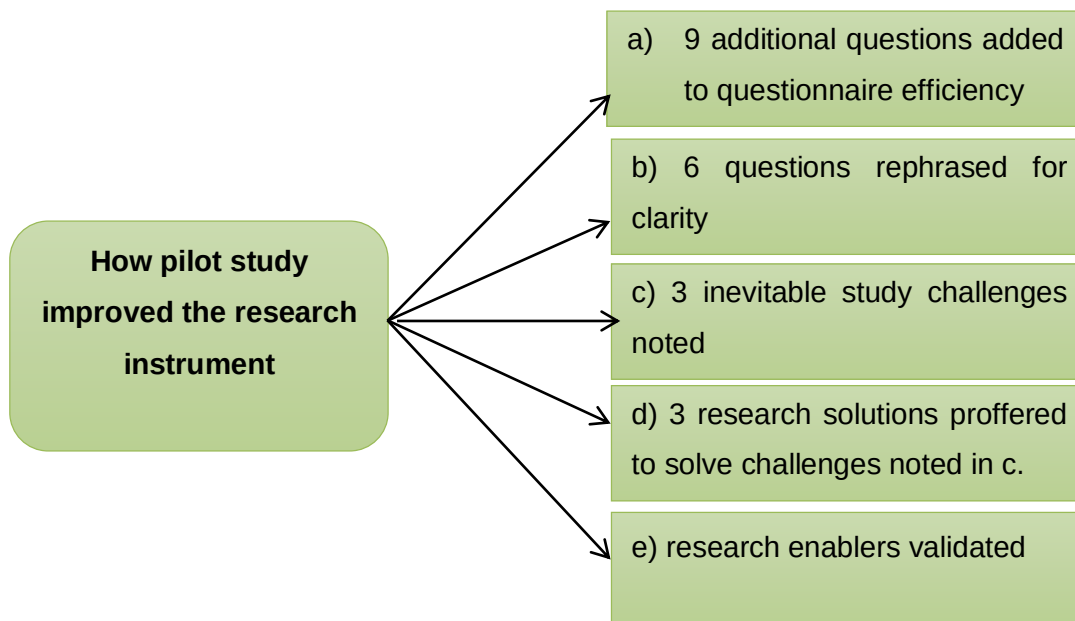


Figure 5-2: Effected changes to the main study from Pilot study

Source: Researcher's own presentation

5.4.1 Questionnaire additional aspects included to the research tool

During the pilot study some information gaps were identified in interviews, and as a result the following variables were added to further improve efficiency and effectiveness of the research tool:

1. GPS mapping through longitudinal and latitudinal coordinates;
2. Ward numbers on the questionnaire to make sure all wards were represented;
3. Religion was added to explain poverty in relation to religion following Zimstat (2017);
4. B3: Do you have any children who is (are) not attending school between 5-16 years? This was added to filter households with school going children;
5. C7: Did you consult a doctor or visit a health facility in the last 6 months? This question was added to establish how many households had consulted doctors or visited health facilities;

6. D8: What is the main drinking water source for your household? (Tick one). The question incorporated water sanitation and hygiene (WASH) which is SDG goal 6 and is being used by UNICEF in poverty measurement. This key question was added as used as many follow-up questions could be linked to the main water sources;
7. D8.1 Where is your main water source located?
8. For how long has your household been owning this asset? The question defines durational poverty which is part of the study objective
9. The study collected data at ward level but analysis was based on categories high density, low density, and medium density and rural. This is because data collected at most of the wards was below 10 households per ward making informed comparisons at ward level inefficient as sample size ought to be above 30 per ward (Swanepoel *et al.* 2010:200; Surujlal, 2004:144). Sample sizes of over 30 per wards required more resources to cover 1380 households.

5.4.2 Questions rephrased to improve on clarity

To improve clarity in the questions and removing ambiguity in responses some questions were rephrased. The questions below were rephrased:

1. C2: In the last 12 months, what is the frequency of any member of your household having any less mild illness? E.g., Flue
2. D9:1 How much time (minutes) does your household take to get water from the main source during the Rain (wet season)
3. D12: Do you worry having insufficient water for domestic use such as drinking? How often?
4. D14: Commonly, what do you think about the quality of your water from the household source?
5. E7: How long have you been earning this income? ...months replaced years
6. E26: (a) Does any member of your household receive any financial assistance from government or donors?

5.4.3 Possible challenges during data collection

1. Accessibility of households in low density suburbs. It was difficult to do interviews in Westgate, low density area such that only 1 interview was possible in 2 hours, instead of a possible of 3 to 4. It was noted that in some households, respondents had other things to do, some were not comfortable to be interviewed and others required approximately 20 minutes before interviews could start.
2. Distance between wards: Data collectors had to travel long distances to cover a single ward. In most cases research assistants walked to conduct within ward interviews and a car was only used for intra ward interviews.
3. Additional budget was required to cater for COVID-19 regulations, and for fuel for intra ward transportation of research assistants.

5.4.4 Possible solutions

1. Wards were clustered under low density, medium density, low density and rural. This helped to cover wards that have access challenge.
2. For data collectors to reach some wards transport had to be provided and the flow of transport was hugely affected by the COVID 19 restrictions.
3. In order to obtain a sample target from households in locations with high security such as low density, sample time was increased.

5.4.5 Study enablers

1. Recruitment of an experienced survey supervisor and six data collectors
2. Use of electronic data collection enhanced quality of results, reduced the lag time between data collection and data analysis and quality check of submission was done in near real time
3. Use of GPS enabled data were obtained from the rightful wards.
4. Use of ODK enabled the study to obtain all answers as all questions from each section were system coded 'important'. It also enabled follow up questions depending on earlier responses for example if household had no children the questions on age schooling were automatically removed by the system

5. Use of electronic ODK system reduced data collection time to below 15 minutes. Furthermore, data collection was reduced through the use of server.

5.5 FIELD DATA COLLECTION PROCEDURES FOR THE STUDY

The study followed a routine procedure to collect data. The following steps were undertaken during the entire data collection process to make sure research data quality is maintained and improved throughout the administering of the research tool:

Step 1: Ethics training to research assistants. The researcher trained the research assistants on ethics guidelines from NWU. Health education for field research guidelines under COVID-19 were emphasised to data collectors.

Step 2: Research team formulation. Research was conducted from location to location hence research assistants formed one team;

Step 3: GPS mapping. The research assistants selected respondents from each location and wards using stratified simple random sampling using GPS. The whole city of Harare was divided into locations as shown in Annexure A1 and A2.

Step 4: Sampling purpose explanation to respondents during sampling: Research assistants explained to the targeted respondents the purpose of the study and asked for their co-operation in line with NWU research ethics

Step 5: Mobile device data capturing by research assistants. The research assistants completed the answers from the respondents on mobile device;

Step 6: Instant ODK Server consolidation of submissions. The research assistants saved data and sent completed questionnaires to the ODK server. Annexure B shows exact locations of samples collected using GPS;

Step 7: Real time preliminary data analysis by the researcher. Researcher periodically analysed data sent to the ODK server in real time to ascertain and to check any anomalies. Researcher made periodic and random site visits to check progress as well as attend interview sessions;

Step 8: Final data analysis and data storage. The researcher finally analysed the findings from the respondents using SPSS and STATA statistical packages. Analysis was performed using various statistical methods including multivariate binary logistic regression, probit

regression and multinomial logit and other statistical methods as done in prior studies (Ravallion & Chen, 1997; Achia *et al.* 2010).

The study adopted data analysis recommended by Hair *et al.* (2010:38-39) which is highlighted in Figure 5-3. The first aspect was to detect sample error through data validity tests. Data was then coded into data server. Data was separated into various segments; each segment represented objectives. Logical data cleaning followed and then data was tabulated. The detection of errors enabled the study to produce descriptive, univariate and multivariate data analysis. Lastly results interpretation followed. The full procedures conducted are highlighted in Figure 5-3.

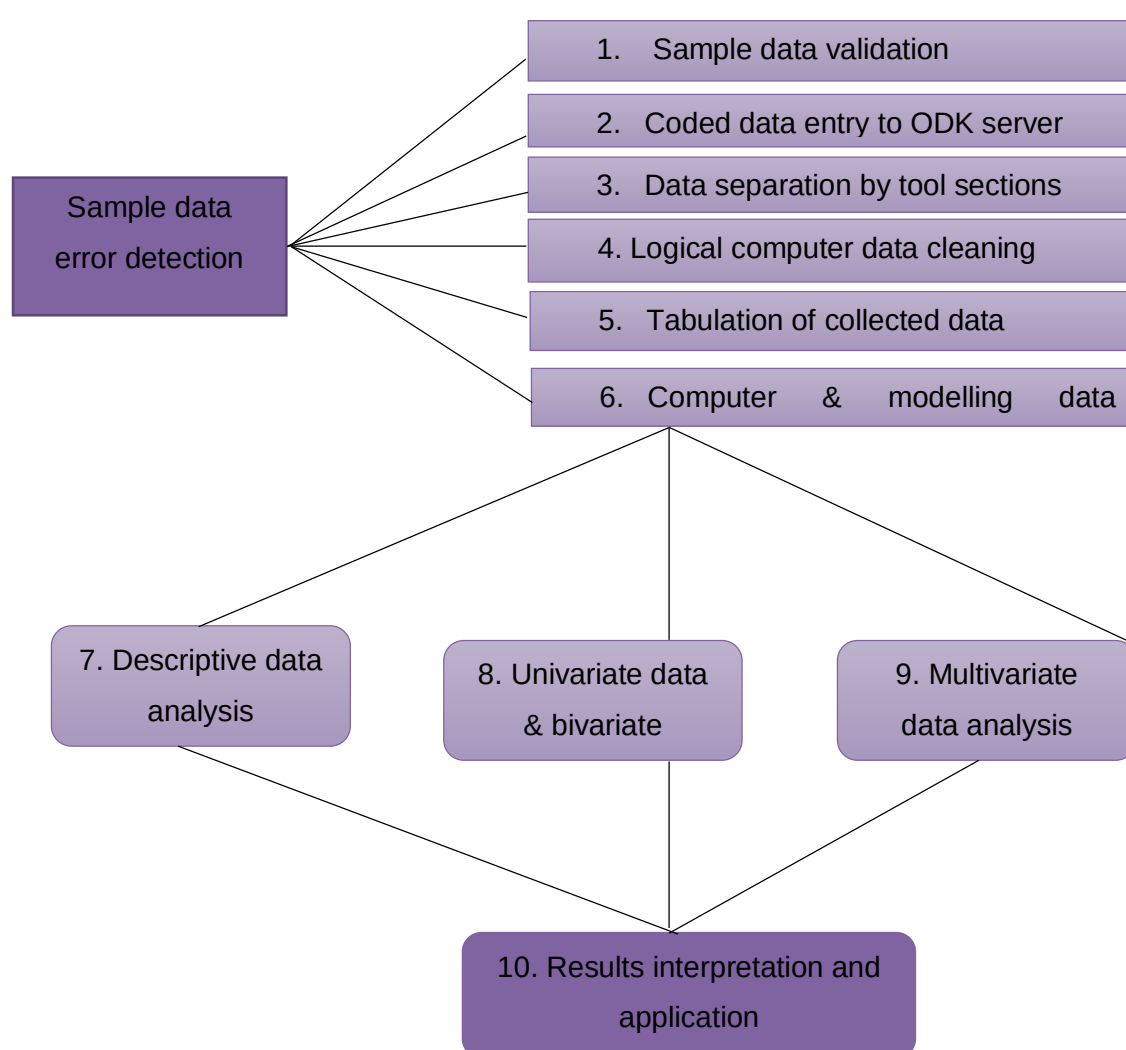


Figure 5-3: Research data planning, administration and reporting

Source: Adapted from Hair *et al.* 2010:38-39

1. Sample data validation.

The aspect was used to confirm that the study interviews were accomplished as specifically required by the research.

2. Coded data entry to ODK server

The data used were already coded from entry. All data entries from the electronic devices were successfully received into the study server.

3. Data separation by tool sections

In order to achieve all study objectives, questionnaire was divided into various sections and each section catered for a certain objective of the study.

4. Logical computer data cleaning

This involved error checking. The study performed computer-based error checking and confirmed all data fitted within required sections and fields.

5. Tabulation of data

The researcher counted the responses from each section to confirm all data were received. This is an important function when descriptive statistics are performed. The study used both one-way tabulation and cross tabulation.

6. Computer Data analysis

Statistical output analysed included:

- descriptive statistics
- diagnostic tests
- odds ratios
- Correlation
- Canonical correlation
- ANOVA
- MANOVA.

At the end of data capturing and analysis, the study materials (videos and audios) and data set were transferred to research promoters for safe keeping in line with ethical guidelines prescribed by NWU.

5.6 DESIGNING A NEW MULTIDIMENSIONAL POVERTY MEASURE FOR HARARE PROVINCE

The selection of dimensions for poverty measurement is the work of researchers (Mitra *et al.* 2011:4) and according to Robeyns (2003, 2005 & 2006) dimension selection include (i) technical construction of dimensions list (ii) methodological justification by scrutinising the dimensions selection process (iii) create list at different generality using theoretical and empirical aspects (iv) apply exhaustion but non reduction principle to make sure all meaningful dimensions for the determination of the study are considered. The advantage of this approach in dimension selection is that it enables inclusion of all dimensions and indicators that are pertinent to the research objectives (Alkire, 2002b). Inclusion of all appropriate dimensions and indicators into the poverty measure “provided a guide to evaluate the completeness of the final measure” (Mitra *et al.* 2011). UNDP and OPHI clearly advise that the choice of dimensions, cut offs rests with priorities within the society investigated “countries choose their own set of dimensions, indicators, weights and cut-offs, according to their national priorities, plans and contexts.” (UNDP& OPHI, 2019:15).

The study undertook the steps advocated by UNDP and OPHI (2016) in developing a new multidimensional poverty measure. These are shown in Figure 5-4. The steps depicted provided the study with a pedagogical approach to develop own poverty measure in the case of Harare province.

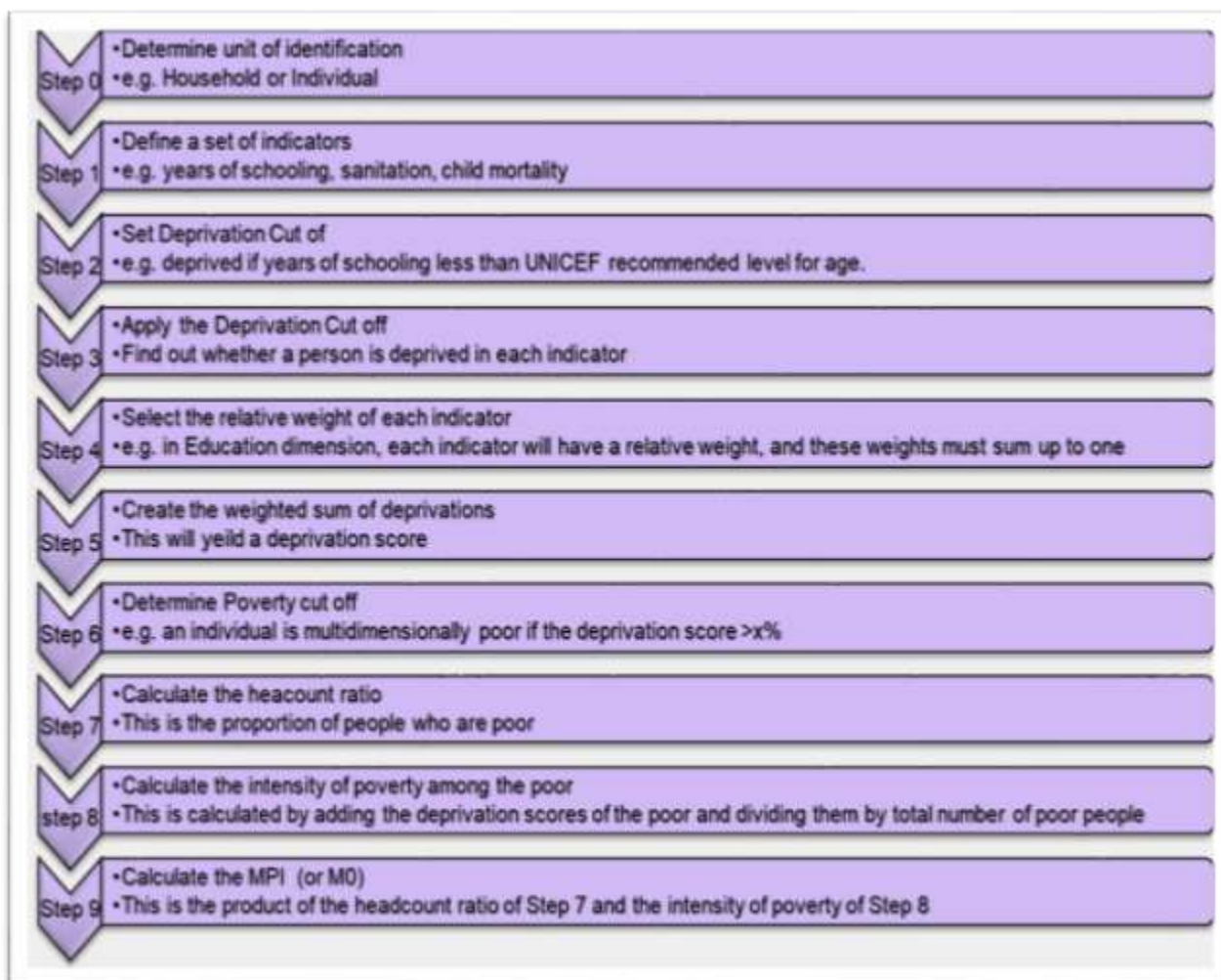


Figure 5-4: Multidimensional Poverty Measure Development Plan

Source: UNDP& OPHI, 2016

Chronologically, the study undertook all steps (0-9), and by the end a poverty measure was developed. The poverty measure is a function of various connecting procedures that the researcher used.

5.6.1 Determination of Unit of Identification

Most studies choose households over individuals when developing a multidimensional poverty measure but the decision is entirely optional to the researcher(s) (Bader *et al.*, 2016). Nonetheless, most studies in social sciences prefer group identification (households, religion, tribe, sex orientation, age, societal, country or political orientation, hobby groups, work or and professional groups) (Wakefield *et al.* 2017:1). It is further specified that associations and groupings are crucial and beneficial for use as unit of identification because they promote, conserve human life and are central to human conditions (Tuomela, 2007). This study adopted

the household as its unit of identification as used by several studies before (UNDP, 2010, 2018, 2019 & 2020, World Bank, 2018, Zimstat, 2012 & 2017).

5.6.2 Determination of Dimensions

Once unit of measurement is determined, the next aspect in the development of a multidimensional poverty measure comprising dimensions and indicators for poverty measure. Dimension and indicator selection remain the burden of the researcher:

“Unusually, the selection of dimensions does not necessarily rely on empirical or technical analysis. Naturally sometimes analysts explore or confirm the extent to which dimensional groupings of indicators is corroborated statistically. Such statistical explorations should not determine the selection of dimensions or grouping of indicators; they may, however, contribute to their justification and expose interesting relationships that should be considered” (Alkire et al. 2015: 19).

Hence, “several new indicators have surfaced which can be used to build national MPIs” (OHDI, 2016) such that there are over 40 dimensions available and evidently used previously in existing studies (Alkire, 2002:98-99). The pertinent question of what dimension to use in a poverty measure remain debatable and data restrictions play a central role (Ravallion, 2011: 5-10). Nonetheless, it is advised that researchers should objectively answer the question why the research is undertaken for poverty reduction. This calls upon researchers to consider political and government-based dimensions as these are key players in ending poverty (White, 2017:2-3). The use of political decisions was separately derived from Rawls (1993) who posited that:

political constructivism provides the ethical basis for justifying the use of the Constitution and its public culture for selecting dimensions...attempt to derive a set of publicly justifiable dimensions of poverty and well-being.

An entire dependency on political decisions to derive poverty dimensions has been strongly disapproved by Martin (1994) because the Rawls Theory is that assumptions drive an impractical ‘Platonic perfectionism.’ This calls for other considerations beyond the political to be factored into the poverty measure. Rippin (2010) proposed researchers to target efficiency in meeting research questions and distributive reasonableness in determining choice of dimensions to use in a poverty measure.

This study uses seven equi-weighted dimensions and various indicators for each dimension that clearly portray forms and nature of poverty in Zimbabwe. Choice for dimensions and indicators for this study was based on UN SDGs 2030. The study also used distributive reasonableness as proposed by Rippin (2010) and considered dimensions widely experienced in Harare.

Furthermore, literature was reviewed; previous studies including Alkire and Santos (2010); UNDP (2010, 2018, 2019 & 2020); World Bank (2018) dimensions were checked for applicability to the Zimbabwean context (Sen, 1994; Burchi *et al.* 2018:245). Data were collected from households on selected dimensions and indicators for the new MPI for Harare province. The study used outcome, flow and objective indicators as part of indicators. Indicators within dimensions used for developing a new multidimensional poverty measure can be “outcome/input/output, flow/stock, objective/subjective, for individuals/households” (Atkinson *et al.* 2002; Atkinson & Marlier, 2010; UNDP, 2019). Table 5-1 shows dimensions and indicators adopted by this study in investigating multidimensional poverty in Harare province. Table 5-1 shows the weighting of each indicator as well as basis for choosing each.

Table 5-1: The dimensions and indicators

Dimensions	Indicators	Household is deprived if...	Weight	Main basis for choosing dimensions and indicators
Education B	B1 Household head level of education	Below secondary education	1/35	SDG 4.1.1
	B2 Highest level of education in the family	Low educational achievements (basic schooling) and early school leavers	1/35	SDG 4.1.1
	B3 School attendance	Household with young children (5-16yrs) not in school or preschool	1/35	SDG 4.1.1
	B4 Distance to school (KM)	School children (5-16years) travels at least 5km to nearest school	1/35	SDG 4c
	B5 School materials/needs affordability	Household could not afford to buy school materials for every child in the past 12 months	1/35	SDG 4c
Health C	C1 Distance to nearest clinic	Travels 5km or more to access health care	1/42	SDG 3.8.2
	C3 Serious illness recorded in HH	HH recorded at least twice in a year	1/42	SDG 3.8
	C4 HH affordability of clinic fees	HH does not afford health care	1/42	SDG 3.8.2
	C5 Quality health care services accessibility in the area	There is no health care service for quality service	1/42	SDG 3.8
	C9 HH fitness and	HH not undertaking	1/42	SDG 3.8

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Dimensions	Indicators	Household is deprived if...	Weight	Main basis for choosing dimensions and indicators
	exercises	exercises		
	C10 Health insurance	No health insurance in the HH	1/49	SDG 3.8
Standards of Living D	D1 House ownership	HH using illegal dwelling or squatting	1/49	SDG 1.4.2 & SDG 11.1.1
	D2 House size	More than 2 people per room	1/49	SDG 11.1.1
	D4 Sanitation	No access to flush toilet	1/49	SDG6.2.1
	D7 Primary source of Cooking fuel	Not using electricity or gas	1/49	SDG7.1.1 & SDG 7.1.2
	D8 Primary source of drinking water	No access to piped water and treated water	1/49	SDG6.1.1
	D8.1 Distance to the primary source of drinking water	Travels more than 30 minutes to obtain HH water for drinking	1/49	SDG6.1.1 & SDG 11.5.1
	D13 Water fees (rates)	HH cannot afford water use fees (rates)	1/49	SDG7.1.1
Economic Security: E	E1 Employment status HHH	HH unemployed	1/35	SDG 8.3.1 & SDG8.5.2
	E3 Employment status- other HH member	No one in the HH is employed	1/35	SDG 8.3.1 & SDG8.5.2
	E5 Income	Monthly income is below USD\$300 or ZWL\$ equivalent (PDL) (1USD: ZWL\$82)	1/35	SDG1.2.1
	E8 Assets ownership	Does not own 40% of the assets listed	1/35	SDG1.4.2
	E22 Land ownership	HH does not hold any land (commercial or agriculture)	1/35	SDG1.4.2
Empowerment & Participation F	F1 Community decision making	HH or any member in HH does not participate in any community decision making	1/28	SDG1.3.1& SDG16. b.1
	F2 Donor/ Government Financial assistance	HH not in receipt of any financial assistance	1/28	SDG8.3.1 & SDG17.3.2
	F3 Community economic and political participation	If any member (s) in community face discrimination	1/28	SDG1.3.1& SDG16. b.1

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Dimensions	Indicators	Household is deprived if...	Weight	Main basis for choosing dimensions and indicators
	F4 Financial Inclusion	Having no bank accounts or access to any credit financial mode	1/28	SDG8.10.2
Environment and Public Infrastructure G	G1 HH mode of transport	Foot mode of transport	1/35	SDG11.2.1
	G2 HH Community roads infrastructure	Bad or unusable or usable with difficulty	1/35	SDG11.2
	G3 Other Public Infrastructure accessed by HH in the community	There are no other public services/ goods available in normal functional state	1/35	SDG11.7
	G4 Pollution	Facing any serious and continuous form of any pollution within their neighborhood	1/35	SDG11.1.1 & SDG11.5.1
	G5 Crime/ violence	HH member experienced crime or violence	1/35	SDG16.1
Food insecurity and adaptation H	H1 HH Food Begging	Sent household members to beg	1/21	SDG2.1.2
	H2 Food rationing	Skipped meals	1/21	SDG2.1.2
	H3 Survival adaptation	Gathered wild vegetables	1/21	SDG2.1.1 & SDG2.1.2

Source: Researcher's own presentation

This study used various indicators within a range of categories at household level. Almost all dimensions and indicators have been used elsewhere and from the researcher's judgment, the dimensions and indicators represent various modes of poverty in Harare province. There is, however, a strong debate regarding the choice of dimensions and indicators when developing multidimensional poverty measures. Some of the common arguments regarding choice for dimensions and indicators are discussed further in this section.

5.6.3 Determination of Indicators

The study selected indicators that are sensible across the different dimensions and effort ensured that all aspects are represented. Indicators chosen possess attributes of being ethically and mutually consistent, balanced weighting, transparency and accessibility (Atkinson & Marlier, 2010; UN, 2016). Atkinson and Marlier (2010: 45) proposed attributes of a good indicator as shown in Figure 5-5:



Figure 5-5: Study indicator selection criterion

Source: Atkinson and Marlier (2010: 45)

Some indicators were dropped as recommended by UNDP (2019:76):

“Before finalising indicators into the national MPI, it is useful to run a preliminary analysis and understand the relationship between indicators. This might lead to dropping an indicator, to combining some indicators into a sub-index or to adjusting the categorization of indicators into dimensions.”

The study has 36 indicators used for developing multidimensional poverty index for Harare province.

5.6.4 Setting Deprivation Cut-offs

Each indicator within and across dimensions has universal cut offs which separate non-poor from the poor across the locations. Literature demonstrates various multidimensional indicators that have been used in other studies. This study adopted existing indicators mostly from UNDP MPI and also use new indicators for its new multidimensional poverty measure as advised by UNDP that:

Setting deprivation cut-offs is a normative exercise. These decisions can be guided by international or national standards (such as the SDGs or national legislation on

compulsory education), by the results of participatory or consultative exercises, or by targets included in national development plans. Ultimately, the deprivation cut-offs will reflect the purpose of the measure, data availability, the aspirations of poor persons and communities, the unit of identification and aspects of indicators design discussed in the previous section (UNPD, 2019:73).

Guided by UNDP practices, the study opted to use what is prescribed by literature. The dimension cut offs used to estimate multidimensional poverty were adopted from Alkire and Foster (2011). The dimensions d are weighted thus w_j is the weight for dimension j . Each person i has dimension weighted counted and c_i represents the deprivation across the dimensions: $0 \leq c_i \leq d$, hence,

$$c_i = \sum_{j=1}^d w_j c_{ij} \dots\dots\dots (1)$$

With $c_{ij} = 1$ if a person is deprived of j variable otherwise $= 0$

Let q_i be a binary number when a person is defined as poor, 0 otherwise. A person is identified as poor as the total deprivations are above the cut off (k) as follows

If $c_i \geq k$, then $q_i = 1$;

If $c_i < k$, then $q_i = 0$

We can now calculate the weighted head count poverty ratio for Harare, which is the total number of people defined as poor divided by the total population, shown below:

$$q = \sum \frac{q_i}{n} \dots\dots\dots (2)$$

The level of deprivations (A) faced by the poor in Harare province are calculated from the average number of deprivations an individual face (ck) divided by maximum number of deprivations poor could face (qd) as follows

Where; $(ck) = (\sum q_i, c_i)$, where $i = 1 \dots n$

$$A = \frac{c(k)}{q(k)} \dots\dots\dots (3)$$

The multidimensional poverty measure for Harare province (MPI_oH) = $HA = \frac{ck}{nd}$ and this can be expressed as follows:

$$(MPI_oH) = \sum_{j=1}^d \frac{w_i H_j}{d} \dots\dots\dots (4)$$

There is now need to first define the cross dimension for poverty thresholds (Mitra *et al.* 2011), this was done by selecting the minimum (k) which a person must be deprived of to be considered poor and is done using $c_i > k$, person i is defined as poor. The formula used is:

$$\frac{c_i}{d} > \frac{k}{d} \dots\dots\dots (5)$$

Or simply k/d thus total deprivations over the total indicators for each dimension.

Poverty threshold of k/d of 33% and above is defined as multidimensionally poor and this has been used before $k/d = 33\%$ (Cook 2006; Burkhauser *et al.* 2009; UNDP, 2010 & 2018; Vick *et al.* 2010; OPHI, 2011; Mitra *et al.* 2011). The findings of using Harare province multidimensional measure are compared with UNDP MPI index to see the statistical significance of the weights on the overall multidimensional poverty.

5.6.5 Cross Dimension Cut-offs

The cross dimensional cut off has been set at 30% as used in previous studies by UNDP (2010). Household would have to be 30% deprived in a dimension, that is to say they should at least be deprived of 1/3 of indicators to be coded deprived. Table 5-2 shows design of MPI matrix cross dimensional cut-offs.

Table 5-2: MPI Matrix for cross dimension cut offs

	Location of Wards (1-46) Rural, LD, HD, MD	Total Dimensions	Total Indicators	Dimension Cut off	Cross Dimensional Cut off Score
Households x, y...n		B	5	1/3	$1\frac{2}{3}$
		C	6	1/3	2
		D	7	1/3	$2\frac{1}{3}$
		E	5	1/3	$1\frac{2}{3}$
		F	5	1/3	$1\frac{2}{3}$
		G	5	1/3	$1\frac{2}{3}$
		H	3	1/3	1

Source: Researcher's own calculations from selected dimensions and indicators

Households are defined poor across dimensions if they are deprived in 1/3 of indicators within the dimension; this methodology was used before by UNDP (2018).

5.6.6 Setting Dimensions and Indicator Weights

The dimensions and indicators are weighted as advised by Alkire and Foster (2011) hence each dimension receives equal weights of 1/7 and indicators are weighted equally within their corresponding dimensions and the total of all dimensions yield a unitary measure (Bader, 2016) and UNDP, 2018). The choice of weights depends on the researcher's own opinion as advised by Sen:

It is thus crucial to ask in any evaluative exercise of this kind how the weights are to be selected. This judgmental exercise can be resolved only through reasoned evaluation, arriving at an agreed range for social evaluations (e.g., in social studies of poverty), there has to be some kind of a reasoned consensus on weights or at least on a range of weights. This is a social exercise and requires public discussion and a democratic understanding and acceptance (Sen 1996: 397).

The education dimension has indicators with weights calculated as follows:

Education indicator weights: $(1/7 * 1/4) = 1/28$.

The rest of the indicator weights within each dimension are calculated in Table 5-3 below:

Table 5-3: Calculation of indicator weights

Dimension	Number of Indicators	Dimension Weight	Indicator Weight Calculation	Indicator Weight
Education	4	1/7	$1/7 * 4$	1/28
Health	6	1/7	$1/7 * 6$	1/42
Standards of living	7	1/7	$1/7 * 7$	1/49
Economic security	5	1/7	$1/7 * 5$	1/35
Empowerment and Participation	4	1/7	$1/7 * 4$	1/28
Environment and Public infrastructure	5	1/7	$1/7 * 5$	1/35
Food adaptation	5	1/7	$1/7 * 5$	1/35
Total	36	1		

Researcher's own calculations

5.6.7 Multidimensional Poverty Index for Harare (MPI_{0H}) Development Flow Process

The choice of indicators and dimensions was based on existing literature review and SDGs. A total of 7 dimensions and 36 indicators with equal weights across dimensions and within

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dimension (indicators) were chosen for the study. Once the data was collected, the study set deprivation cut-offs. Once the study rejects H_0 and concludes a household is poor that is if the household falls below the cut-off, deprivation matrix was developed.

The Figure 5-6 depicts the workflow process in developing multidimensional poverty measure for Harare province.

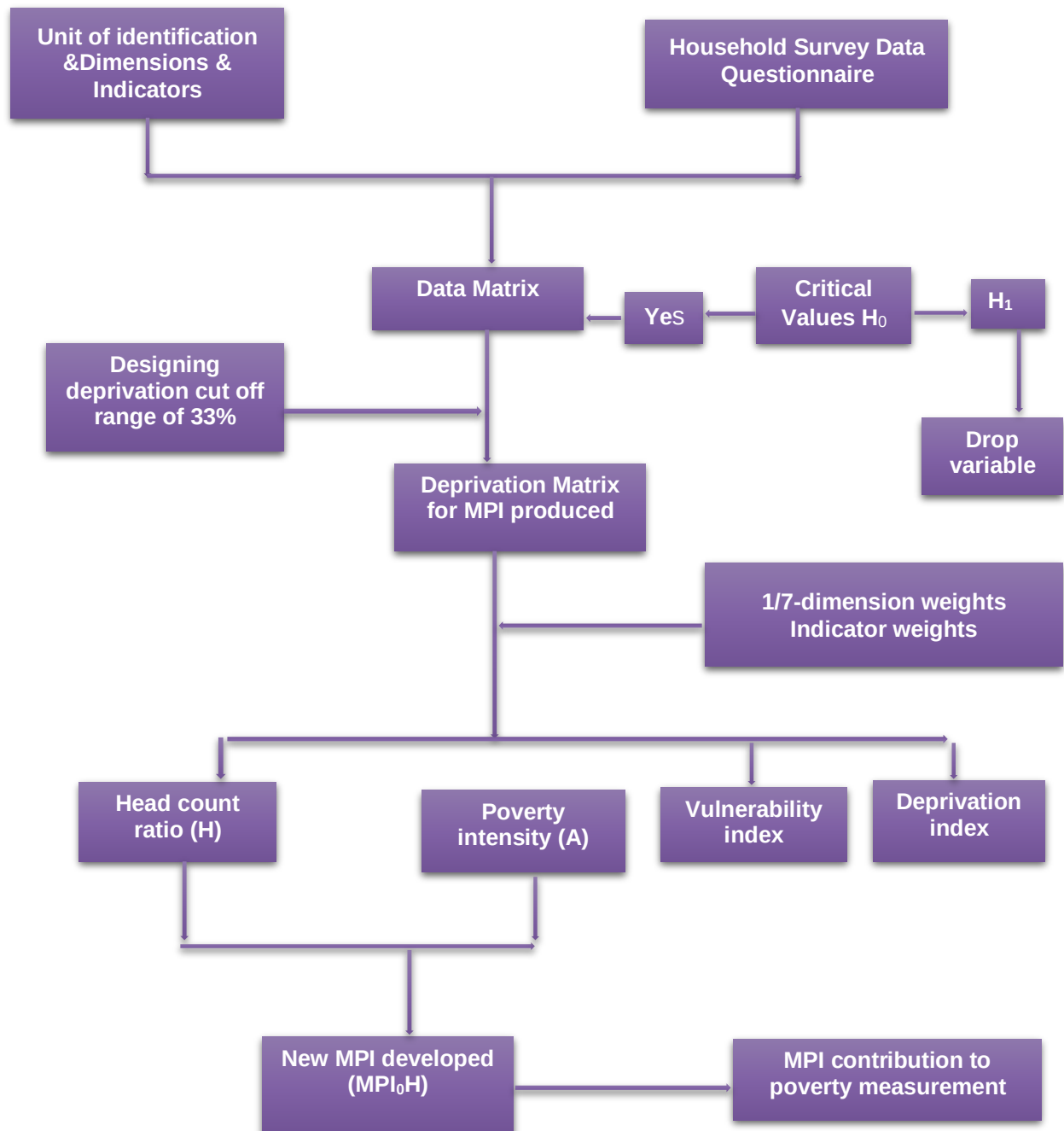


Figure 5-6: Diagrammatic Presentation of MPI Development Flow Process

Researcher's own presentation

5.6.8 Durational Poverty measurement

The study applied Foster (2009) methodology to determine durational poverty. Metzler (2014) argues that the main advantage is that “both P_α and K_α , τ measures are decomposable, allowing for closer examination of subpopulations.” Foster method allows the study to answer the following questions:

1. What portion of overall poverty does each group contribute (rate & gap)?
2. How deep was each group’s poverty experience (gap2)?
3. What are the rate and gap index trends over time and across subgroups?
4. How do poverty rates and gaps change for different poverty durations?
5. Does K_α change the poverty portrait painted by P_α for subgroups?” (Metzler, 2014:), the sub populations will be the Wards.

Foster (2009) applied P_α to a dynamic function $K_{\alpha,D}$, where D is the duration line which measure as a percentage of observations spent in poverty. Hence, the Foster poverty duration adjusted index can be presented as follows:

$$K_{\alpha,D}(y, z, t) = \frac{1}{nT} \sum_{t=1}^T \sum_{i=1}^q \left(\frac{z_t - y_{i,t}}{z_t} \right)^\alpha \dots\dots\dots (3)$$

Where $(y, z, n \& q)$ are defined as in equation (2).

T is the total number of periods.

The study developed an asset index that could be used to determine durational poverty of households. The asset index is made up of 15 assets in which respondents were asked for how long they had ben owning each asset. Use of composite asset index is common and has been successfully used in prior studies (Filmer & Pritchett, 1998; Booysen *et al.* 2005; Nam *et al.* 2008; Moser & Felton, 2007:1). Asset index construction for durational poverty used in this study include households, assets and period of ownership or non-ownership (deprivation) from 2010 to 2020.

Asset index “method employs data of household’s assets such as durable and semi-durable goods to describe household welfare...the index requires less data intensive resulting in smaller measurement error and being suitable for technical capabilities of government statistical

offices...is a very useful tool for a national household survey” (Prakongsai, 2019:4). Table 5-4 shows study’s adopted Composite Asset Index for measuring durational poverty in Harare.

Table 5-4: Composite Asset Index for Measuring Durational Poverty in Harare

Asset Components	Household x, y, ..., n	Period when first owned by household by year from 2010- 2020	Period of deprivation by year from 2010-2020
Income	X	2019	9 years
House			
Car vehicle			
Motorcycle/ bicycle			
Radio			
Television			
PC or laptop			
Refrigerator			
Washing machine			
Microwave			
Stove			
Cell phone			
Bank savings/ deposit account			
Vacuum cleaner			
Land ownership			

Researcher’s own components of asset index

The asset index was derived from the assets above as follows:

$$A_j = \frac{\sum_{i=1}^n f_i(a_{ji}-a_i)}{s_i} \dots\dots\dots(1)$$

A_j is the asset index for each household

f_i is the score of each asset

a_{ji} is asset j of household i

s_i is standard deviation of assets for each household.

The study obtained standardised assets for each household for the last ten years.

5.6.9 Vulnerability to poverty Index

This measures population at risk of multidimensional poverty. It is calculated from households with MPI ranging between $1/5$ and $1/3$, (OPHI, 2011:11). The measure is crucial in poverty measurement as it enables estimation of households who are not currently poor but have the highest probability of being pushed into poverty over time due to changes in macro and micro circumstances (Pritchett *et al.* 2000:1; OPHI, 2011:11)

5.7 METHODS FOR MEASURING MULTIDIMENSIONAL POVERTY FOR THE MODEL

The study performed multiple logistic regression to investigate multidimensional poverty in Harare province. Asset index was used to develop durational poverty. This section presents in detail the methods used to measure multidimensional poverty for Harare province, Zimbabwe.

5.7.1 Multiple Logistic Regression

Multiple logistic regression was chosen for analysis of the MPI developed in this model because it that allows many variables to be used in the research instrument concurrently and variables can be tested using either saturated (full) or null (empty) model (Sperandei, 2013) and the model was used in earlier multidimensional poverty measurement studies (Maity, 2018; Iqbal, 2019; Fonta *et al.* 2020). Logistic regression is most suited for analysis of multidimensional poverty because it is “well suited for describing and testing hypotheses about relationships between a categorical outcome variable and one or more categorical or continuous predictor variables” (Peng *et al.* 2002:4). Logistic regression is sometimes referred to as logit model which is a transformation of logistic regression to dealing with the problem of sigmoidal or S-shaped curve in regression through the use of odds ratios (Peng *et al.* 2002:1). Logistic models estimate relationships between covariates X_1 in dichotomous (1 or 0), categorical (dimensions or indicators) and continuous between $(-\infty \text{ \& } +\infty)$ such as age and child weight. The saturated model of logistic regression resulted in the study dropping insignificant variables and significant variables with low statistical power from the model while the null model required the study to add variables one by one. The study employed the saturated model because it is easier to handle, and results can easily identify insignificant variables that had to be dropped. Logistic regression models use many explanatory variables.

5.7.1.1 Empirical logistic model

The formulation of logistic regression is shown as follows:

This study adopted the logistic model by Sekabira *et al.* (2012). The model can be shown as:

$$\text{Probability} = \frac{e^z}{1+e^z} \text{-----(1)}$$

Where probability is the chance of household multidimensional poverty.

The logit transformation of probability in terms of Z is shown as

$$Z = \ln \left(\frac{p}{1-p} \right) \text{-----(2)}$$

Z can be denoted as follows

$$Z = X'\beta + \varepsilon \text{-----(3)}$$

Where probability (Y = outcome of household poverty/X= x).

Using logistic cdf, the multidimensional poverty logit model gives the conditional probability

$$\text{Prob}[Y=1/x_i] = \Lambda(x'\beta) = \frac{e^{x'\beta}}{1+e^{x'\beta}} = \frac{1}{1+e^{-x'\beta}} \text{-----(4)}$$

and

$$\text{Prob}[Y=0/x_i] = 1 - \Lambda(x'\beta) = 1 - \frac{e^{x'\beta}}{1+e^{x'\beta}} = \frac{1}{1+e^{x'\beta}} \text{-----(5)}$$

The probability is

$$L(\beta) = \prod_{i=1}^n \left\{ \left[\frac{e^{x'\beta}}{1+e^{x'\beta}} \right]^{y_i} * \left[\frac{1}{1+e^{x'\beta}} \right]^{1-y_i} \right\} \text{-----(6)}$$

The log-likelihood is

$$l(\beta) = \sum_{i=1}^n y_i x'\beta - \sum_{i=1}^n \ln(1+e^{x'\beta}) \text{-----(7)}$$

β s are vector of regression parameters, X is vector of indicators (independent variables) determining likelihood of multidimensional poverty.

ε is the stochastic error term when we assume a logistic distribution. X can be categorical or continuous.

$\text{Prob}(MPI_0H = 1/X)$ is the likelihood that the is multidimensionally poor

$\text{Prob}((MPI_0H = 0/X)$ is the probability the household will not be multidimensionally poor

X is vectors include all indicators from the 7 dimennsions

Z takes the value of 1 if household is multidimensionally poor and 0 if otherwise

The logit model adopted from Sekabira *et al.* (2012) thus can be shown as:

$$\log\left(\frac{\pi}{1-\pi}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots \beta_m X_m \dots\dots\dots (8)$$

Where;

Π indicates the probability of household poverty occurring

MPI_0H for each household is derived.

β_1 represents the regression coefficients or the slope of the coefficient

X_1 represents the 36 indicators which are the explanatory variables in the model.

The model used the marginal effects of the model in (1) to estimate the modes of poverty in Harare as their coefficients can only be used to determine significance of the dimensions while marginal value can only be determined from the marginal coefficients (Greene, 2012; Iqbal, 2019).

The chances of occurrence of an event when using logistic regression can be low, medium or high as shown below:

$$\text{Low chance } \log\left(\frac{\pi}{1-\pi}\right) \beta_0 + \beta_1 X_1 + \beta_2 X_2 = \beta_1 0 + \beta_2 0 = \beta_0 \dots\dots\dots (9)$$

$$\text{Medium chance } \log\left(\frac{\pi}{1-\pi}\right) \beta_0 + \beta_1 X_1 + \beta_2 X_2 = \beta_1 1 + \beta_2 0 = \beta_0 + \beta_1 \dots\dots\dots (10)$$

$$\text{High chance } \log\left(\frac{\pi}{1-\pi}\right) \beta_0 + \beta_1 X_1 + \beta_2 X_2 = \beta_1 1 + \beta_2 1 = \beta_0 + \beta_2 \dots\dots\dots (11)$$

The value of β s indicates the direction of the relationship between the regressed (Y) and the regressors (X). If the value of β s >0 , X is related with larger logits of Y and conversely, when β s <0 , X is associated with smaller logits of Y (Peng *et al.* 2002).

The odds ratios from the logistic regression can be obtained by transformation from probability to log odds as follows;

$$\text{Logit} [\pi(x)] = \ln(\text{odds}) = \ln\left(\frac{\pi(x)}{1-\pi(x)}\right) = \beta_0 + \beta_x \dots\dots\dots (12)$$

The odds are the ratio of probability of $\pi(x)$ that the event occurs (outcome) for value x of the random variable X . The odds ratio of $1 - \pi(x)$ is the ratio of probability that an event does not occur for the value x of the random variable X .

From equation (5) the following can be deduced

$$\pi(x) = \Pr\left(\frac{Y=1}{X=x}\right) = \frac{e^{\alpha+\beta x}}{1+e^{\alpha+\beta x}} \dots\dots\dots (13)$$

Equation (6) is the maximum likelihood (ML) and the significance will be represented by the p values.

5.7.1.2 Logistic Regression Odds ratios

The use of logit odds ratios in logistic regression exists in several studies (Machamer & Gruber, 1998; McNeal, 1998; Trusty, 2000; Peng *et al.* 2002) as “logistic regression predicts the logit of an event outcome from a set of predictors” (Peng *et al.* 2002). The odds ratios enable the study to investigate relationship between an exposure and outcome (Rath, 2017:310). It indicates the odds of an outcome happening given a certain exposure. The value of odds ranges from 0 to ∞ and between $-\infty$ and ∞ for log odds. Odds ratios for x and y can thus be shown as follows:

$$\text{Odds Ratio (X, Y)} = \frac{\text{Odds } X}{\text{Odds } Y} = \frac{\frac{PX}{1-PX}}{\frac{PY}{1-PY}} \dots\dots\dots (14)$$

The study used 7 dimensions to determine the sum of weighted indicators a household must be deprived in order to be identified as poor. The analysis was constructed as follows; (k=3, k=4, k=5, k=6) to give a clear picture of poverty in Harare. Poor households were assigned 1 while non-poor is 0.

5.7.1.3 Logistic regression dependent variable derivation

Each household's MPI_0H or simply (MPI_0HH) was used as dependent variable. The MPI for the study used A & F methodology of 2011 as used before by other studies (Iqbal, 2019; Fonta *et al.* 2020). The head count was multiplied with poverty intensity to measure each household's multidimensional poverty for Harare province and is given as follows:

$$MPI_0H = A * H = \frac{1}{n} \sum_{i=1}^n a_i k \dots\dots\dots (7)$$

Where;

H is the number of households who are multidimensionally poor

A is the poverty intensity

The study performed Hosmer and Lemeshow goodness-of-fit test for the logistic regression. Hosmer and Lemeshow statistic is given as:

$$\hat{C} = \sum_{k=1}^g \frac{(O1k - E1k)^2}{E1k(1 - \xi_k)}; E1k = sk\xi_k \dots\dots\dots (8)$$

Where;

$O1k$ is the number of observations with ($Y=1$) out of sk

$E1k$ is the expected event count in the k^{th} group

ξ_k is the average predicted event probability for the k^{th} group.

5.7.1.4 Logistic regression independent variable derivation

The logistic regression regressors were the 36 indicator variables as provided in preceding chapter, Table 5.1. The indicators are different from the dependent variable in that the dependent variable is an index obtained after applying weights and cut-offs to calculate each household multidimensional poverty index whilst the dependent variable is applied in absolute terms across the 400 households. The independent variable takes the value of 1 if household is deprived or 0 otherwise.

5.7.2 Diagnostic tests

The study performed multicollinearity tests and goodness of fit tests in order to ascertain the suitability of the developed logistic regression models in predicting changes in the response variable. Sections 5.6.3.1 and 5.6.3.2 discuss the tests in detail.

5.7.2.1 Multicollinearity

Multicollinearity is a condition which exists when two or more regressor variables are highly associated or correlated within the regression model being analysed. Multicollinearity makes the statistical significance of regressors (X) to the dependent variable (Y) difficult to distinguish. Some of the causes for the presence of multicollinearity include insufficient data set, inaccurate dummy variable (s), inclusion of similar variables and addition of more variables.

Variance Inflation Factors (VIF) were used to determine the presence of multicollinearity.

The VIF is given by the following

$$VIF_j = \frac{1}{1-R_j^2} \dots\dots\dots (1)$$

Where

R_j^2 is the R^2 for j^{th} dimension or predictor.

VIF of the coefficients must be below 10 ($VIF < 10$), however ($VIF < 2.5$) is the most preferred and the general rule of thumb is that VIF above 4 requires further analysis and investigation (Daoud, 2009:2-5). VIF values start from 1 signifying perfect absence of multicollinearity. Tolerance values below 0.25 indicate presence of multicollinearity in regressors and such variables require further investigation or dropping (Hair *et al.* 1995; Ringle, 2015). The study tested VIF on both dimensions and indicators used in the study and if multicollinearity is detected appropriate actions were made to rectify the anomaly.

In the presence of multicollinearity, the study dropped some independent variables as a way of fixing it before the data modelling.

5.7.2.2 Model goodness of fit: Hosmer-Lemeshow goodness of fit test

Before multiple logistic regression was run, the study tested how accurately the sample data distribution represents the population which is model's goodness of fit. This was attained using the Hosmer-Lemeshow goodness of fit test.

"The purpose of any overall goodness-of-fit test is to determine whether the fitted model adequately describes the observed outcome experience in the data" (Hosmer & Lemeshow, 2000). The model shows how the probable events from the logistic regression replicate the number of observed occasions in the data. The model allows the study to scrutinise if the differences between observed values and fitted values are small. In general, if the covariance between regressors is small or zero, the model is a good fit.

$$H_0: E(Y) = \frac{\exp(X'B)}{1 + \exp(X'B)} \dots \dots \dots (2)$$

$$H_0: E(Y) \neq \frac{\exp(X'B)}{1 + \exp(X'B)} \dots \dots \dots (3)$$

The first task was order the fitted values

Group the fitted values

Calculation of the observed and expected numbers for each group

Calculate the X^2 goodness of fit test

X^2 goodness of fit test can be shown as follows;

$$C_g = \frac{\sum_{j=1}^c \sum_{k=0}^1 (O_{jk} - E_{jk})^2}{E_{jk}} \dots \dots \dots (3)$$

Where c is the grouped values classes

If H_0 holds, reject

5.8 PERCEPTION OF POVERTY MEASUREMENT

The study grouped perceptions into three broad types of perception as used before (Feagin, 1972, Nasser *et al.* 2002) which are structural, fatalistic and individualistic. The use of three groups eased analysis as to which group forms the main perception of poverty. Also, from each

group the study assessed the values for each indicator in order to formulate poverty perceptions for Harare province.

5.8.1.1 Poverty Perceptions dependent variable

The MPI₀H for each household is the dependent variable. The variable is made of MPI₀H for each household as indicated in section 5.6.2.1. The dependent takes the binary values:1 for poor and 0 otherwise.

5.8.1.2 Poverty Perceptions independent variable

The independent variables of the model are 14 variables across the three classes of perceptions as shown below in Table 5-5. Each variable has an equal weighting. The grouping of the perceptions is shown in Table 5-5 below.

Table 5-5: Poverty Perceptions independent variables

Poverty Perceptions	Indicators
Individualistic	H1: They lack the ability to manage money.
	H2: They waste their money on inappropriate items
	H3: They do not actively seek to improve their lives.
	H16: Poverty is inevitable and its part of life?
Structural	H4: They are exploited by rich people
	H5: The society lacks social justice
	H6: Distribution of wealth in the society is uneven
	H7: They lack opportunities because they live in poor families.
	H8: They live in places where there are not many opportunities
Fatalistic	H9: They have bad fate.
	H10: They have bad luck.
	H11: They have encountered misfortunes.
	H12: They are not motivated because of welfare.
	H13: They are born inferior.

Source: Feagin (1972); Nasser *et al.* (2002); Grobler and Dunga (2016)

The poverty perceptions are categorised as follows:

Perceptions in which households strongly agree and agree takes 1 while strongly disagree and disagree and neither agree or disagree takes 0.

5.8.2 Pearson Test: Perception of Poverty

Before regression model was executed, the study performed Pearson test to determine the suitability of the model independent variables in explaining poverty perceptions using Pearson test.

5.8.3 Perception of Poverty: Logistic regression model

Logistic regression was used to analyse the multidimensional poverty perceptions as used in previous studies (Peng *et al.* 2002; Grobler & Dunga, 2016; Rotarou, 2017). The study initially used unconditional mode (Mode 0). This mode estimates poverty perceptions across dimensions within Harare. Individual level determinants (Mode 1) were used to analyse poverty perception at individual level. Attributes such as location were examined to measure poverty perceptions to understand location level determinants (Mode 2).

Models a chance of an outcome using many explanatory variables

$$\log\left(\frac{\pi}{1-\pi}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots \beta_m X_m \dots\dots\dots (8)$$

Where;

π indicates the probability of an event occurring

β_1 represents the regression coefficients or the slope of the coefficient

X_1 represents the explanatory variables in the mode. The probability of an event occurring can be shown as follows;

$$P(Y = 1) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3)}}$$

Where; $P(Y = 1)$ is the probability of an event occurring ($Y = 1$), event occurs while ($Y = 0$), event does not occur.

Y is the dependent variable (binary)

β stands for the logistic regression coefficients and X is the independent variables used in the model.

$$\text{Odds Ratio (X, Y)} = \frac{\text{Odds X}}{\text{Odds Y}} = \frac{\frac{PX}{1-PX}}{\frac{PY}{1-PY}}$$

5.9 CONCLUSION

This chapter presented the research methodology that was used to investigate circumstantial and durational urban poverty by developing a new multi-dimensional measure in the case of Harare province. The study achieved the study objectives by adapting the UNDP MPI to develop own poverty measure. The first task was to develop a research design that guided the study. The design formulated used descriptive technique and quantitative research. The study performed validity and reliability tests. In total 4 validity tests were performed: face validity, content validity, criterion validity and concurrent validity. Reliability tests were performed together with applicable statistical methods. The reliability test performed are parallel form reliability, test-retest reliability, inter-rater reliability and split half reliability test. Furthermore, as a way of strengthening the research tool, pilot study was administered in representative wards of rural, high-density, medium-density and low-density locations. A total of 47 households making 11.4% of the sample population participated. The research made a total of 25 questions on the research tool as informed by pilot study. The research proceeded to develop data collection procedure. The study adopted stratified simple random sampling and collected data from 400 households across all 46 wards in all locations of the province. The research developed a multidimensional poverty measure, durational poverty measure, logistic regression and poverty perceptions. The study successfully developed procedures for developing own multidimensional poverty measure for Harare (MPI_{oH}). Firstly, the study selected 7 dimensions and 35 indicators that will be used to achieve objective 1 of the study. The study provided MPI_{oH} which has equal weights across dimensions and within dimensions (indicators). Durational poverty was analysed using Foster methodology while perceptions of poverty were investigated using logistic (logit) regression. The next chapter presents and analyses the data collected in this study.

CHAPTER 6: RESULTS AND DISCUSSION

6.1 INTRODUCTION

This chapter presents results addressing the objectives on: An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province. The data was collected from household questionnaire administered across the 46 wards of Harare province as discussed in Chapter 5. The households were grouped into high density, medium density, low density and rural locations in Harare. Analysis of the results is at location level; (high density, medium density, low density and rural locations) and not ward based because some sample sizes in some wards were below 30 making ward comparisons not feasible.

The study used sample size of 400 households drawn across all the 46 wards in Harare. Before main study was performed, validity and reliability tests were conducted on the research tool. In addition, a pilot study at 11.4% of the sample size was undertaken in representative wards of all locations. The study reports descriptive statistics on demographic characteristics of the sample as developed in the Data Analysis Plan (DAP). DAP for this study presents demographic statistics results followed by addressing the set objectives designed to.

1. Adapt the UNDP MPI and develop a multidimensional measure of circumstantial poverty;
2. Determine the durational urban poverty for Harare province;
3. To compare poverty among the locations in Harare using the developed multi-dimensional measure;
4. To determine the perception of urban poverty in Harare province;
5. Investigate the drivers of circumstantial urban poverty in Harare;
6. Offer recommendations on policies that could be used to reduce urban poverty in Zimbabwe.

Each research objective is answered separately with descriptive and/ or logistic results provided. Except for objective six which is on recommendations, *a priori* information was used to compare results with existing researches. Researcher's presentation of Harare province wards

and actual location households that participated in the study from ODK server is shown on Harare map Annexure B.

Map provided in Annexure B indicates the actual household locations using data that was collected from Global Positioning System (GPS) enabled devices within each of the 46 wards of Harare. Sample mean from each ward averaged 8, which is statistically insignificant to determine sample results at ward level as the minimum standard for results comparison is ideally $n \geq 30$ (Swanepoel et al. 2010:200). Therefore, analysis at ward level is not done because sample sizes in some wards ($n \leq 30$) and this is statistically insignificant for comparison and reporting (Surujlal, 2004:144; Swanepoel et al. 2010:200). Study sample size by location is highlighted in Table 6-1 below.

Table 6-1: Sample size by location

Location	Pilot study	Main study	Total samples collected
Harare rural	12	42	54
High density	14	216	230
Medium density	6	49	55
Low density	15	46	61
Total	47	353	400

Source: Researcher's own sample calculations

Wards were grouped according to locations (Harare rural, high density, medium density and low density) using the city of Harare boundaries map and Zimstat (2017) demarcations. The full breakdown of the results by wards in all locations is shown in Annexure A1-A2. The sample sizes from each location were above 30 samples per each location. Annexure B shows the actual ward locations of the households which were sampled on Harare map which is shown in Annexure C.

6.2 DESCRIPTIVE RESULTS: DEMOGRAPHICS

The study reports on household sizes, age, gender, religion and marital status of the sample for Harare province. The results are based on location as rural, high density, medium density and low-density.

6.2.1 Positions of respondents: household head or spouse

The study required each respondent to indicate if they are household head or spouse. This was designed to ensure data were collected from people responsible for household provisions, who

ordinarily face circumstantial poverty decisions. In this study, the female is the spouse to the household head while male is the household head. The results in Figure 6-2 summarise the data.

Table 6-2: Positions of respondents: Household head or Spouse

		Location(s)									
		Rural		High density		Medium Density		Low density		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
Respondent Household position	Household head	27	50.0%	112	48.7%	28	50.9%	37	60.7%	204	51.0%
	Spouse	27	50.0%	118	51.3%	27	49.1%	24	39.3%	196	49.0%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Source: Researcher's sample data set

In rural Harare (ward 1) the respondents were 50% household heads and 50% spouses. In high density 51.3% responses were from spouses and 48.7% were from household heads. The findings for medium density were different as more household heads participated than spouses (50.9% household heads to 49.1% spouses). The results for low density show that 60.7% respondents were household heads and 39.3% were spouses. Overall, 51% of the study responses came from household heads while 49% were from spouses.

Table 6-3: Relationship between poverty and respondent position

		Is the household poor					
		Not Poor		Poor		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Respondent position In the household	Household head	57	54.3%	147	49.8%	204	51.0%
	Spouse	48	45.7%	148	50.2%	196	49.0%
	Total	105	100.0%	295	100.0%	400	100.0%

Source: Researchers's own calculations from survey data

Table 6-3 above provides information on relationship between poverty and respondent position in the household- i.e., head or spouse. The study found that households where the respondent was household head had 49.8% poverty while households represented by the spouse of the household had 50.2% poverty. The results indicate that the relationship between respondent and respondent position in the family (head or spouse) marginally gives similar results and this makes sense as the respondent is just speaking on behalf of the family regarding family's

circumstantial poverty without altering the household circumstantial poverty. This was monitored as survey data was being collected to make sure the variable was not changing when household head or spouse were interviewed. The near similarity of the data collected from the spouse and household head gives comfort to the researchers that spouse was a good proxy of household head. Spouse usage enabled the study to proceed in 49% households whose head was not present during data collection.

6.2.2 Households characteristics

The mean and standard deviation of houses in Harare by location is presented in Table 6-4 below.

Table 6-4: Households sizes characteristics

		Households' characteristics	
		Mean	Standard Deviation
Harare Province Locations	Harare Rural	3	1
	High density	3	1
	Medium Density	4	1
	Low density	3	2
	Total	3	1

Source: Researcher's calculations using SPSS

The overall average household size for the sample is 3 people per household. Medium density had the largest mean household size of 4 people whilst rural, low density and high density have mean sample sizes of 3 people per household.

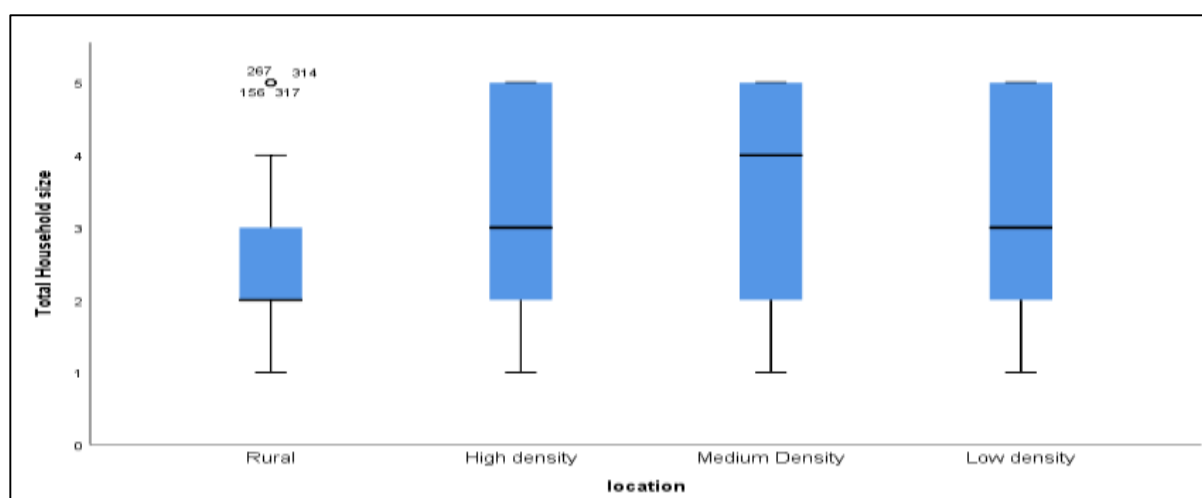


Figure 6-1: Sample mean size distribution

Figure 6-1 shows the study's sample size distribution. The mean for rural respondents shows that most households there have 2 or more members. In high density some households have up to 5 members per household. In medium density the sample mean household size is 4, but households' members range from 2-5 members. The mean of 3 children per household is not different from Zimstat and UNFPA (2017: xiii) which concluded that there are 3.7 children per household in Harare.

6.2.3 Results of sample population distribution

The samples from all the locations are above 30, the minimum sample size required for comparisons, (n=30) makes comparisons feasible and statistically valid (Surujlal, 2004:144; Swanepoel *et al.* 2010:200). Table 6-5 below shows sample distribution across all locations (wards) of Harare province; Harare rural, high density, medium density and low density.

Table 6-5: Average population age by locations

Population distribution								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Harare Rural	54	43.26	12.269	1.670	39.91	46.61	20	78
High density	230	42.57	14.487	.955	40.69	44.45	19	90
Medium Density	55	43.36	15.150	2.043	39.27	47.46	20	87
Low density	61	45.51	12.675	1.623	42.26	48.75	23	78
Total	400	43.22	14.026	.701	41.84	44.60	19	90

Source: Survey data

The results show that 57.5% (n=230) population distribution of the sample was from high density, low density is 15.25% and medium density have 13.75% of the total sample. Harare rural has 13.5% of the sample. This was based on the weighted population of each location. Probability Proportion to Size (PPS) was used to allocate the statistically determined sample size for Harare province as discussed in Chapter 5.

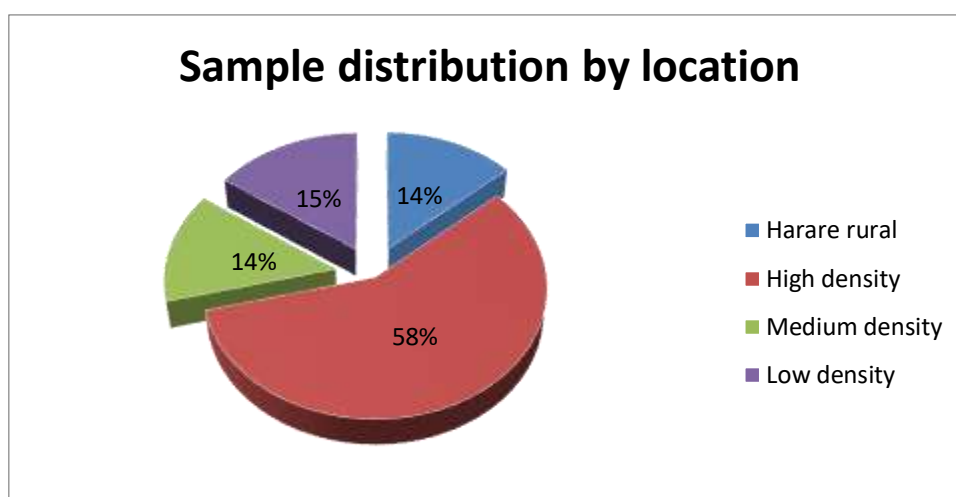


Figure 6-2: Sample population distribution

Source: Survey data

The sample population distribution in Figure 6-2 shows that high density has the largest population of the sample. Low density, medium density and high density have statistically similar sample sizes ranging between 54-61 people per location.

Table 6-6: Household location and poverty

		Not Poor		Poor		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Location	Rural	2	1.9%	52	17.6%	56	13.5%
	High density	37	35.2%	193	65.4%	230	57.5%
	Medium Density	27	25.7%	28	9.5%	55	13.8%
	Low density	39	37.1%	22	7.5%	61	15.2%
	Total	105	100.0%	295	100.0%	400	100.0%

Source: Sample data

Table 6-6 indicates poverty across the locations in Harare province. The Pearson Chi-Square test for household location and poverty was found to be significant. Of the poor households in the sample, 65.4% are in high density, Harare rural had 17.6%, medium density had 9.5% and low density had 7.5%. The results further show that 93% of people in rural areas are poor while high density had 84% poverty. Medium density had poverty record of 51% while low density had the lowest poverty at 36%. The results make economic sense as the apriori expectations are

that rural residents have higher poverty followed by high density then medium density and the least poverty is evident in low density suburbs.

6.2.4 Ages of respondents

The average age for the study for the sample was 44 years as shown in Table 6-5. Low density respondents have the highest mean at 46 years while rural, high density and medium density average age of 43 years. Despite these age variations by location, the Anova test shows that the difference in the mean age by location was not statistically significant ($p=0.549$).

Table 6-7: Sample population distribution: Ages of respondents

Rural		High density		Medium Density		Low density	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
43	12	43	14	43	15	46	13

Source: Researcher's calculations using SPSS

The full analysis of the sample results is shown on histogram below in Figure 6-3. It can be noted from the histogram that ages of the respondents across all the locations (Harare rural, high density, medium density and low density are not markedly different.

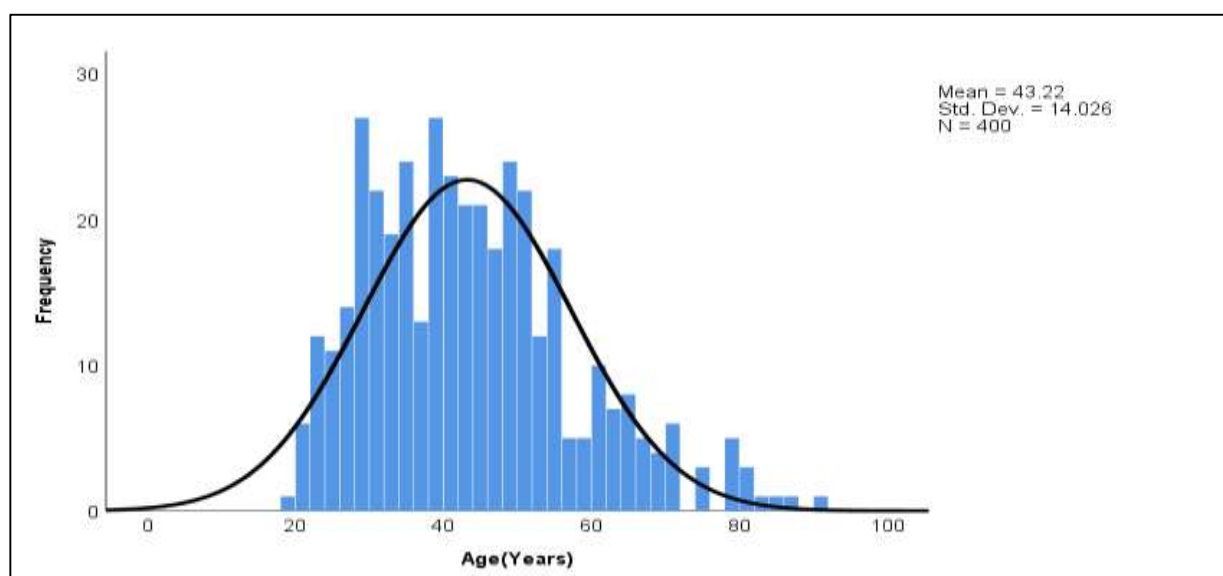


Figure 6-3: Age distribution of the participants

Source: Researcher's presentation using survey data

The sample age distribution for the study across all locations in Harare follows a normal distribution and the average age for the study across all locations in Harare is 44 years as depicted in Figure 6-3. The overall average age of 44 years is closely related to national mean

of 45.6 reported by Zimstat (2017:49). Table 6-8 below depicts the relationship between poverty and age of respondents surveyed in Harare.

Table 6-8: Relationship between poverty and age of respondents

Group Statistics					
	Is the household poor	N	Mean	Std. Deviation	Std. Error Mean
Age	Not Poor	105	45.47	12.789	1.248
	Poor	295	42.42	14.376	.837

Source: Researcher's own calculations from survey data set

The p-value for age ($p=0.044$) indicates that age is a significant factor in explaining circumstantial poverty in Harare province. The mean age of poverty is 42 years which accounts for 73% of the sample while non-poor mean age is 46 years which accounts for 26% of the sample.

6.2.5 Gender characteristics of respondents

The rural sample is 13.5% of the total sampled households; 37% are male while female sample size is 63%. In high density locational wards, male to female respondents were 29.1%: 60.9% respectively. Medium density indicates male-female proportions as 49.1%: 50.9%, showing an almost equal proportion from both genders. Table 6-9 shows gender distribution across all the locations in Harare.

Table 6-9: Location and gender characteristics of respondents

Gender	Harare Rural		High density		Medium density		Low Density		Total
Male	20	37.0%	90	39.1%	27	49.1%	28	45.9%	165
Female	34	63.0%	140	60.9%	28	50.9%	33	54.1%	235
Total	54	100%	230	100%	55	100%	61	100%	400

Source: Researcher's calculations using survey data

High density had a sample size of 230 (90 male and 140 female). Medium density had a sample size of 55 (27 male and 28 female). Low density location had total sample size of 61 (28 male and 33 female). Figure 6-4 highlights the total participants from each location.

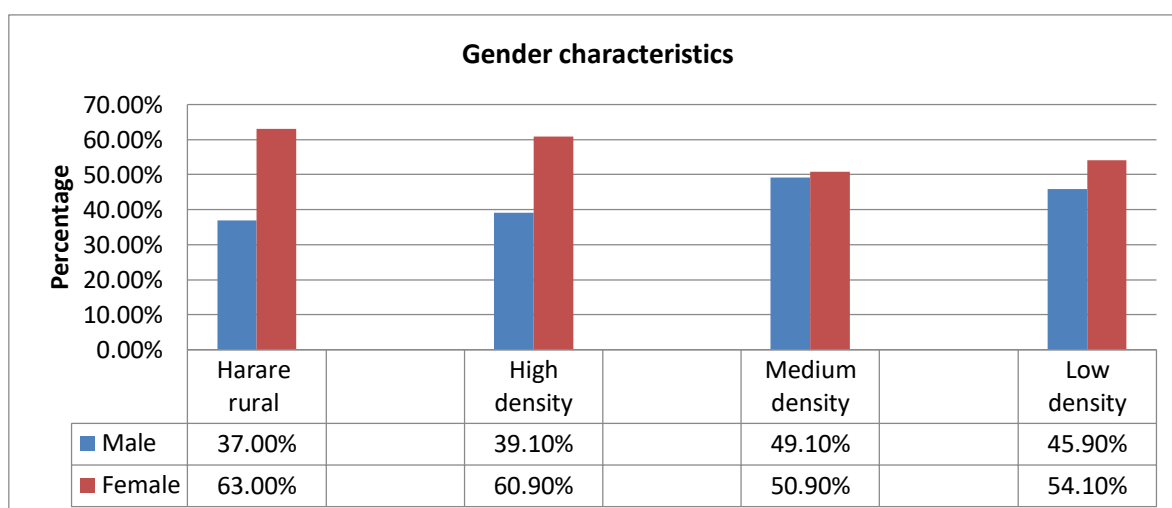


Figure 6-4: Demographic characteristics by location

Source: Researcher's calculations using survey data

High density had the largest sample 58% because majority of Harare wards are in high density areas. The overall sample is female 59% and male is 41%. These results are not very different from Zimstat findings of male 62.1% and female 38% (Zimstat, 2017:50). Relationship between poverty and gender is shown below in Table 6-10.

Table 6-10: Relationship between circumstantial poverty and gender

		Is the household poor					
		Not Poor		Poor		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Gender	Male	49	46.7%	116	39.3%	165	41.2%
	Female	56	53.3%	179	60.7%	235	58.8%
	Total	105	100.0%	295	100.0%	400	100.0%

Source: Survey data

The Pearson Chi-Square statistic of 0.000 shows that location is a strong determinant of circumstantial poverty and this is an *a priori* expectation. This study found that households headed by females were poorer at 60.7% than male headed households which had 39.3% poverty. The study findings are in line with *a priori* expectations and findings from previous studies that found more poverty in women than men (Millar & Glendinning 1989:1; Chant, 2006:2; Chanie & Begashaw, 2018:1).

6.2.6 Sample Marital Status

Respondents who participated in the survey were captured into 5 unique classes. The marital status analysis is important in understanding the circumstantial aspects of household poverty. The marital status findings of the study are reported in Table 6-11 below:

Table 6-11: Marital Status Analysis of the respondents

Marital status		Harare Rural		High density		Medium Density		Low Density		Total	
A	Single	3	5.6%	21	9.1%	9	16.4%	6	9.8%	39	9.8%
B	Married	42	77.8%	161	70.0%	31	56.4%	39	63.9%	273	68.3%
C	Widowed	8	14.8%	35	15.2%	11	20.0%	13	21.3%	67	16.8%
D	Divorced	1	1.9%	12	5.2%	3	5.5%	3	4.9%	19	4.8%
E	Separated	0	0.0%	1	0.4%	1	1.8%	0	0.0%	2	0.5%
	Total	54	100%	230	100%	55	100%	61	100%	400	100%

Source: Survey data

It was found that 273 (68.3%) of the respondents are married while 67(16.8%) are widowed, 39 (9.8%) single, 19 (4.8%) divorced and 2 (0.5%) are separated. From the sample, the high density has the largest number of single people in Harare while rural locations had the least number of single people. These findings are fascinating if related to the average age of the respondents of the study. Given the fact that average age group is 44 years, it is probable that most people would have migrated to Harare high density to seek better life.

The relationship between poverty and marital status is shown in the table below. It was established that 67.5% of poverty was in married families. Widowed households had 18% poverty, single (unmarried) households had 8% poverty whilst divorced had 7.1% poverty and finally separated had 0.7% poverty. The findings show that poverty was highest among married families and this is not the *a priori* expectations of the study. As a result of this anomaly, the study assesses other factors beyond marital status in order to explain poverty in Harare. Marital status related to highest poverty among married households mainly because the highest poverty areas (rural and high density) had highest population in the sample 77.8% and 70% respectively. Nonetheless, Sadiq (2010:203) also found higher poverty of 45.3% in married households and lowest poverty of 4.6% in unmarried families. The relationship between poverty and household head marital status is shown below in Table 6-12.

Table 6-12: Relationship between poverty and household head marital status

		Is the household poor					
		Not Poor		Poor		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Marital status	single	10	9.5%	29	9.8%	39	9.8%
	Married	74	70.5%	199	67.5%	273	68.2%
	widowed	14	13.3%	53	18.0%	67	16.8%
	Divorced	7	6.7%	12	4.1%	19	4.8%
	separated	0	.0%	2	.7%	2	.5%

Source: Survey data

6.2.7 Level of Education of Household Head

Household head's level of education was divided into different classes which are primary education and below, secondary education, vocational education and university qualification. The results of the variable are shown in Table 6-13 below:

Table 6-13: Level of Education of Household Head

Level of Education of respondent		Harare Rural		High density		Medium Density		Low Density		Total	
a	Primary and below	8	14.8%	22	9.6%	4	7.3%	3	4.9%	37	9.3%
b	Secondary	43	79.6%	168	73.0%	31	56.4%	27	44.3%	269	67.3%
c	Vocational	2	3.7%	13	5.7%	4	7.3%	11	18.0%	30	7.5%
d	University	1	1.9%	27	11.7%	16	29.1%	20	32.8%	64	16.0%
	Total	54	100%	230	100%	55	100%	61	100%	400	100%

Source: Researcher's own calculations using survey data

Level of education of the household head for the overall sample was mostly secondary education (67.3%). This is in tandem with the Zimstat (2012:89) findings of secondary education (61%) being the majority level of education in Zimbabwe and report by UNESCO that 77.9% of children in Zimbabwe achieved secondary education in 2013 (UNESCO, 2020). Analysis of data by location reveals a significant variation on household head education status ($P < 0.01$). The highest proportion of household heads with primary education or lower were found in rural location (14.8%) followed by high density (9.6%). The least were in Low density (4.9%) while medium density constitutes 7.3%. The study's results on household head/ spouse and level of education is depicted in Table 6-14 that follows below:

Table 6-14: Relationship between household head level of education and poverty

	Is the household poor					
	Not Poor		Poor		Total	
	Count	Column N %	Count	Column N %	Count	Column N %
primary and below	0	.0%	37	12.5%	37	9.2%
secondary	52	49.5%	217	73.6%	269	67.2%
vocational	13	12.4%	17	5.8%	30	7.5%
university	40	38.1%	24	8.1%	64	16.0%
Total	105	100.0%	295	100.0%	400	100.0%

Source: Researcher's own calculations from survey data

The Chi-Square for household level of education and poverty was found to be significant (0.000). All households with only primary education were 100% poor and the share of their poverty was 12.5% of sample total poverty. Households headed by a head with only secondary education were 81% poor and contributed 73.6% poverty to relationship between poverty and househead level of education. Vocational training attained household heads had 57% poverty count and households with heads with university degrees had 38% poverty count. Proportion of poverty primary education heads (12.5%). Third contributor to total poverty were households with university degrees while vocational training household heads had 8.1% poverty. The study found that poverty was lowest among households with vocational education (5.8%). The findings make economic sense given the fact that there is high unemployment across the economy and similar results were found in Zimbabwe by Bhebhe *et al.* (2015); and Kanyenze, (2010:1).

Table 6-15: Relationship between poverty and highest level of education in the family

		Is the household poor					
		Not Poor		Poor		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
What is the highest level of education in the family?	Primary	0	0%	16	5.4%	16	4.0%
	Secondary	26	24.8%	206	69.8%	232	58.0%
	Vocational	6	5.7%	29	9.8%	35	8.8%
	University	73	69.5%	44	14.9%	117	29.2%
	Total	105	100.0%	295	100.0%	400	100.0%

Source: Researcher's own calculations from survey data set

The study determined the relationship between highest level of education and poverty and this is shown in Table 6-15. The Pearson Chi- Square of 0.000 indicates that level of education is a strong determinant of poverty. Households with only primary education were 100% poor and contributed 5.4% to the highest level of education poverty. Families with secondary education only had 89% poor households and this contributed to 69.8% of household level of education poverty. Households with vocational training as highest level of education in the family were 83% poor and this was 9.8% of overall family education poverty. Households with university degree(s) in their family had 38% household level of education poverty and this contributed to 14.9% of overall poverty on household level of education. The findings are in tandem with a priori expectation that increase in education reduces poverty. The results above in Table 6-15 are replicated in a pie chart as shown below in Figure 6-5

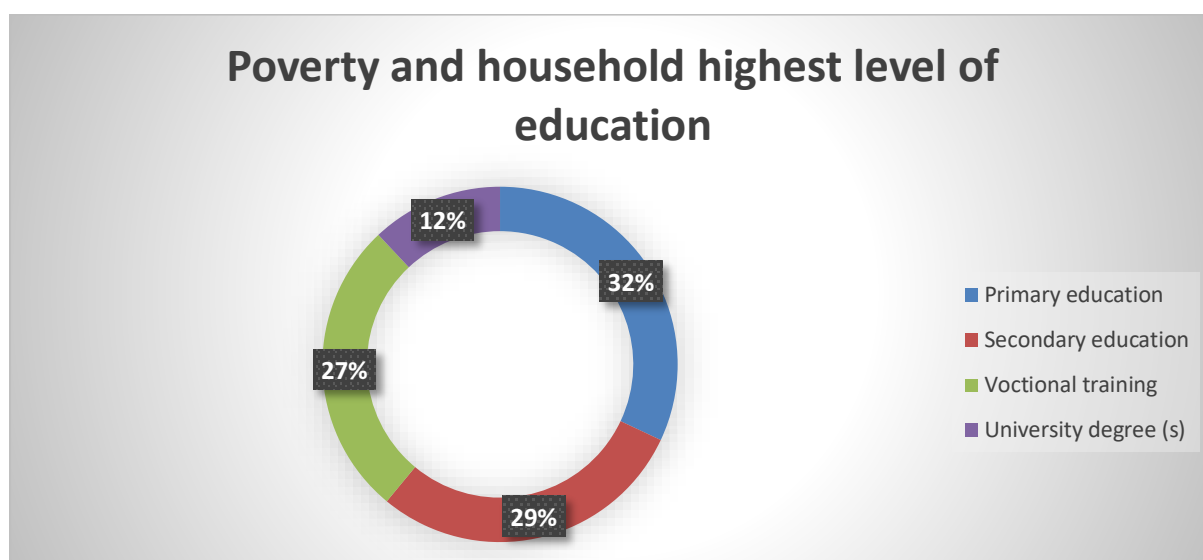


Figure 6-5: Poverty and household highest level of education

Source: Researcher's own calculations from survey data

There is rampant poverty but the less educated are most vulnerable. The study findings are in tandem with *a priori* expectations that poverty decreases with education. University attainment reduces poverty more than any other education level in households while primary education and secondary education have a 2% marginal difference in poverty.

6.2.8 Household children below 16 years

The study asked respondents to indicate if they have children below the age of 16 years. This variable was also used in education dimension. The results of this variable are shown in Table 6-16 below:

Table 6-16: Household children below 16 years

Household Children		Harare Rural		High density		Medium Density		Low Density		Total	
	Yes	32	76.2%	133	57.8%	26	59.1%	28	65.1%	219	61.0%
	No	10	23.8%	97	42.2%	18	40.9%	15	34.9%	140	39.0%
	Total	42	100%	230	100%	44	100%	43	100%	359	100%

Source: Researcher's own calculations using survey data

The study found that 61% of households have children below 16 years and only 39% of households do not have children in this age range in Harare. Rural respondents had the greatest number of children below 16 years (76%) followed by low density (65.1%) while high density (57.8%) and low medium density (59.1%) have statistically similar household children. Children below 16 years have been determined to be poor given the overall sample mean of poverty of 42%.

6.2.9 Religion

Based on similar national household surveys such as census and Zimstat (2017), there were 8 responses regarding household religion that were provided for respondents. The results on religion were only available after pilot study as this was an added variable hence sample size is less than 400 (n=359). The relationship between religion and location is shown in Table 6-17.

Table 6-17: Religion of Respondents by Locations

Household Religion		Harare Rural		High density		Medium Density		Low Density		Total	
a	Tradition	0	0.0%	3	1.3%	2	4.5%	0	0.0%	5	1.4%
b	Roman Catholic	6	14.3%	40	17.4%	6	13.6%	11	25.6%	63	17.5%
c	Protestant	1	2.4%	21	9.1%	2	4.5%	2	4.7%	26	7.2%
d	Pentecostal	8	19.0%	58	25.2%	16	36.4%	10	23.3%	92	25.6%
e	Apostolic Sect	22	52.4%	51	22.2%	4	9.1%	2	4.7%	79	22.0%
f	Other Christian	4	9.5%	31	13.5%	7	15.9%	16	37.2%	58	16.2%
g	Muslim	0	0.0%	2	0.9%	3	6.8%	1	2.3%	6	1.7%
h	Other	0	0.0%	10	4.3%	3	6.8%	0	0.0%	13	3.6%
i	None	1	2.4%	14	6.1%	1	2.3%	1	2.3%	17	4.7%
	Total	42	100%	230	100%	44	100%	43	100%	359	100%

Source: Researcher's own calculations using survey data

The study found that 25.6% of Harare households are Pentecostal and this is statistically related to 2014 Zimstat findings that found Apostolic sect to have 23% population in Harare and 32% population in the country (Zimstat, 2016:7-8). However, this study finding that Roman Catholic households are 17.5% of Harare is statistically different from Zimstat findings that established Roman Catholic households make 57% population in Harare (Zimstat, 2016:9). Figure 6-6 shows the religion denominations in Harare.

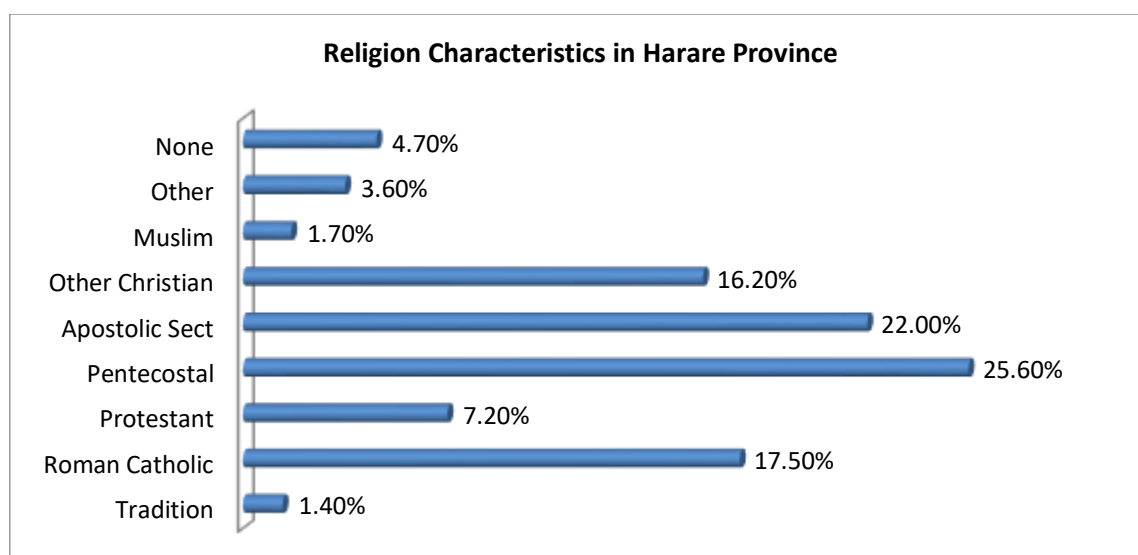


Figure 6-6: Religion presentation

Source: Researcher's own calculations using survey data

Results depicted in Figure 6-6 show that most of the household respondents were Pentecostals at 25.6% followed by Apostolic sect with 22.0%. The least was African tradition at 1.4% and Muslim at 1.7%. Analysis locations shows a significant variation ($p < 0.01$) in terms of religion of respondents. Harare rural has the highest number of Apostolic sect 57% while in high density and medium density most people are Pentecostal 25% and 36.4% respectively. In low density locations most people are other Christian 37.2%. Table 6-18 depicts the relationship between religion in Harare province and poverty.

Table 6-18: Relationship between poverty and religion sect

Relationship between poverty and religion in Harare				
	Is the household poor			
	Not Poor		Poor	
	Count	Column N %	Count	Column N %
Tradition	2	2.1%	3	1.1%
Roman Catholic	23	24.0%	40	15.2%
Protestant	6	6.2%	20	7.6%
Pentecostal	29	30.2%	63	24.0%
Apostolic Sect	8	8.3%	71	27.0%
Other Christian	20	20.8%	38	14.4%
Muslim	4	4.2%	2	.8%
Other	3	3.1%	10	3.8%
None	1	1.0%	16	6.1%
Total	96	100.0%	263	100.0%

Source: Researcher's own calculations from survey data

The study produced a p-value of 0.001, implying there is a strong relationship between poverty and religion. It was found that poverty is worst among Apostolic Sect (27%) followed by Pentecostal (24%). In third place are the Roman Catholics (15.2%), in fourth place are other various Christian denominations at 14.4% and least are Muslims at 0.08% poverty.

6.3 MULTIDIMENSIONAL POVERTY INDEX FOR HARARE PROVINCE (MPI_{0H})

The principal objective of the study is to develop a new MPI for Harare. Sections 6.3.1, 6.3.2 and 6.3.3 highlight the developmental processes used in the study. To achieve this objective, the study adapted UNDP MPI as expounded by Foster (2009) to develop a multidimensional measure of circumstantial poverty using head count (H) and Intensity of poverty (A). The Multidimensional Poverty Index for Harare (MPI_{0H}) is calculated from multiplying the head count (H) and poverty intensity (A). First, we calculate the Head count.

6.3.1 Head Count Poverty (H) for Harare Province

Head count, $H = \frac{q}{n}$ is the first step towards calculating MPI.

Where q stands for the total number of people who are multidimensionally poor. The multidimensionally poor are found by adding sizes of households whose values are above the cut off (33.3%).

n is the total sample size Total population is the number of household sizes sampled, both poor and non-poor count. Chapter 5, Figure 5-6 presented stages that were followed to get to head count measure and Table 6-19 projects how the Head count poverty was calculated by the study.

Table 6-19: Head count poverty calculation

	Harare Rural	High density	Medium Density	Low density	Total
Multidimensional poor (q)	258	915.23	129.39	98.59	1404.22
Total population (n)	258	1043	239	281	1821
Headcount (H)	1.00	0.8774976	0.54138075	0.350854	0.7711258

Source: Researcher's calculations using survey data

The results in Table 6-19 indicate that the head count poverty for Harare incidence is 0.77%. The proportion of poor people in Harare rural was 100%, implying that everyone in Harare rural is multidimensionally poor when head count (H) is used to establish multidimensional poverty. The head count measure found that the proportion of poor people in high density is 0.88% poverty whilst medium density has 0.54% and 0.35% poverty in low density. It can be concluded that in the province, rural dwellers are the poorest when compared to the other provinces. Head count poverty measurement shows that everyone in rural Harare is in multidimensional poverty.

6.3.2 Poverty intensity for Harare Province

Poverty intensity (A) measures the breadth of poverty.

$$A = \frac{c_i(k)}{q}$$

where $c_i(k)$ measures the censored deprivation score of each person i .

q refers to the total number of people multidimensionally poor. It is summation of all multidimensionally poor households multiplied by the household sizes of each household. The weighted number of deprivations for Harare rural is 0.50 while weighted deprivations for low density are 0.48. Medium density and low density have weighted number of deprivations of 0.47 and 0.45 respectively. The calculation of poverty intensity is provided in Table 6-20 below:

Table 6-20: Intensity of Poverty

	Harare Rural	High density	Medium Density	Low density	Total
Censored Deprivation Score ci(k)	1235.72	4199.04	535.86	446.18	6416.8
Total Multidimensionally Poor (q)	249	877	115	98	1339
Intensity of Poverty (A)	0.496273	0.4787958	0.465965	0.455285	0.4792233

Source: Researcher's own calculation using survey data

When poverty intensity is used, 50% of rural dwellers are in poverty while 48% are poor in high density areas, 47% in medium density and lastly 46% in low density are poor. Poverty intensity is marginally similar across all locations. The overall poverty is thus 48%.

6.3.3 Computation of Multidimensional Poverty Index for Harare province (MPI₀H)

MPI is calculated by multiplying head count poverty (H) and poverty intensity (A) according to OPHI, (2011) and UNDP, (2018 & 2019).

$$MPI_0H = H \times A$$

where (H) is head count poverty and (A) is intensity of poverty

The full computation for this study's MPI for Harare province is shown on Table 6-21 below

Table 6-21: Computation of Multidimensional Poverty Index for Harare (MPI₀H)

	Harare Rural	High density	Medium Density	Low density	MPI ₀ H
Headcount (H)	1.00	0.8774976	0.54138075	0.350854	0.7711258
Intensity of Poverty (A)	0.49627309	0.4787959	0.46596522	0.455286	0.4792233
MPI ₀ H	0.49627309	0.42014225	0.2522646	0.1597389	0.36954143

Source: Researcher's own calculations using survey data

The overall MPI₀H is 0.37 or (37%). Harare rural recorded MPI of 0.50 implying that 50% of respondents in Harare rural are multidimensionally poor while Harare high density has 42% poor households. Medium density has 25% poor households while low density has 16% poor households. The overall multidimensional poverty for Harare is 37% across all the locations.

6.4 COMPARISON OF POVERTY AMONG THE LOCATIONS IN HARARE USING THE MULTIDIMENSIONAL MEASURE DEVELOPED IN THIS STUDY

The third empirical objective of this study is to compare multidimensional poverty across locations in Harare (Harare rural, high density, medium density and low density) using the d MPI₀H developed in this study. Poverty head count and intensity of poverty have been discussed in the preceding sections above. This section discusses poverty vulnerability in Harare locations. The construct poverty vulnerability enables the study to predict people who are not currently in poverty but are highly susceptible to it. The study uses the computed MPI₀H in the preceding section to compare multidimensional poverty across 4 locations in Harare province. Figure 6-7 below depicts the multidimensional poverty index for Harare (MPI₀H).

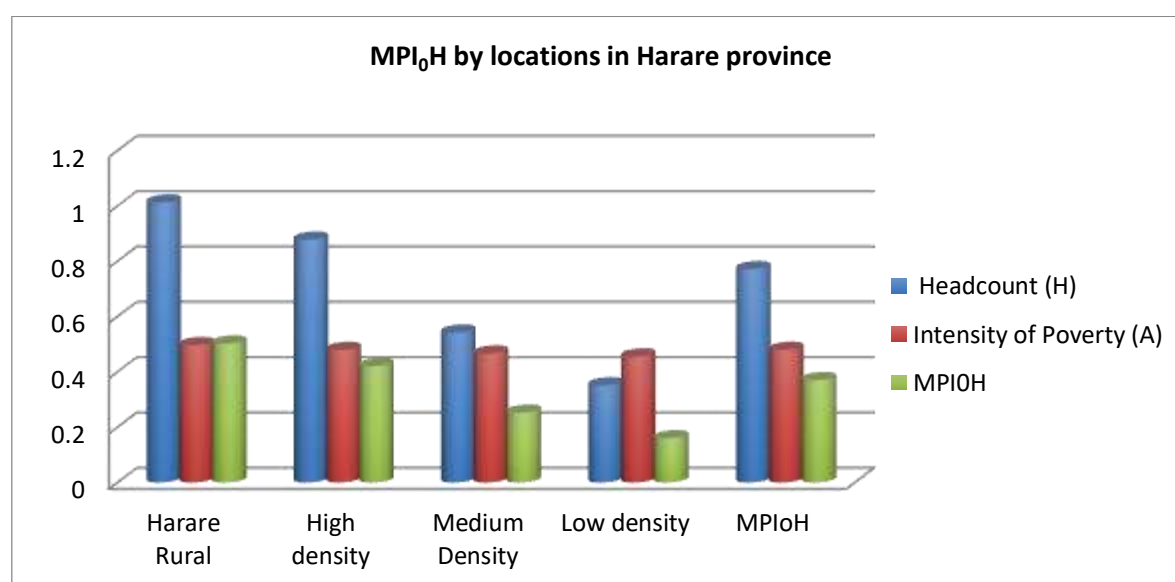


Figure 6-7: Poverty head count, intensity and MPI in Harare province locations

Source: Researcher's own calculations from survey data

Harare rural recorded MPI of 0.50, high density recorded MPI of 0.42 while medium density recorded 0.25. Harare low density recorded MPI of 0.16. The results show that poverty is more rampant in Harare rural (50%) followed by high density (0.48). Harare medium density and low-density areas recorded MPI₀ of 25% and 16% respectively. There was a small difference (0.08%) between Harare rural and high density MPI₀H. Low density and medium density MPI₀s are below MPI₀H indicating that they contribute less to the overall MPI₀H. The study expected poverty to decrease as we move from poor income areas to high income areas and this was confirmed by the results. The overall Harare MPI (MPI₀H) of 0.37 indicates that there is high poverty which is statistically higher than Zimbabwe MPI of 0.137 produced by UNDP in 2015 (UNDP, 2019:7). The statistical significance of the differences produced between MPI₀H and

UNDP MPI is attributed to an increase in dimensions and indicators of poverty. Given that Zimbabwe is largely rural populated, it is anticipated that the MPI for Zimbabwe if calculated using MPI_{0H} would be higher as more poverty is confirmed in rural areas based on the findings above.

6.4.1 Levels of deprivation: Varying MPI cut-offs

This analysis was used before by Foster, (2009; and Alkire & Foster, (2010) and it helps to understand the relationship among Head count poverty (H), poverty intensity (A) and multidimensional poverty MPI. The study used k=2, k=3, k=4, k=5, k=6 and k=7 to compare results to MPI_{0H} (k=0.33). Table 6-22 depicts the relationship between cut offs and deprivation.

Table 6-22: Using different cut offs to determine levels of deprivation across Harare

	Rural			High density			Medium Density			Low density			Overall		
k	MP	H	A	MP	H	A	MP	H	A	MP	H	A	MP	H	A
0.10	0.50	1.00	0.49	0.44	0.98	0.45	0.32	0.86	0.37	0.24	0.73	0.34	0.40	0.93	0.43
0.20	0.50	1.03	0.49	0.44	0.98	0.45	0.32	0.84	0.38	0.25	0.71	0.35	0.40	0.93	0.43
0.30	0.50	1.02	0.49	0.43	0.92	0.47	0.28	0.65	0.43	0.19	0.46	0.42	0.38	0.83	0.47
0.33	0.50	1.00	0.49	0.42	0.87	0.48	0.25	0.54	0.47	0.16	0.35	0.46	0.37	0.77	0.47
0.40	0.45	0.84	0.54	0.36	0.69	0.52	0.19	0.37	0.52	0.12	0.25	0.49	0.31	0.60	0.52
0.50	0.33	0.57	0.58	0.21	0.35	0.58	0.10	0.17	0.58	0.06	0.10	0.57	0.19	0.32	0.58
0.60	0.14	0.21	0.66	0.07	0.11	0.65	0.07	0.11	0.64	0.02	0.02	0.67	0.07	0.11	0.65
0.70	0.02	0.03	0.73	0.01	0.01	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.77

Source: Researcher's own calculations using survey data

The study applied varying cut-offs to understand the behaviour of headcount (H), poverty intensity (A) and MPI. Poverty headcount decreases as cut-off is increased while poverty intensity increases. MPI calculated from varying cut-offs decreases. The graph in Figure 6-7 below plots the relationship between H, A and MPI for Harare province. In rural Harare when k=1, k=2 and k=3, MPI remains unchanged at 51%. In high density areas for cut offs (k=1, k=2, k=3 and k=4), the MPI was between 42% and 44%. MPI for low density is less than the respective MPI for high density for all (k=1 to k=7). An increase in cut offs reduces multidimensional poverty across all locations. In medium density and low-density areas, when k=7, MPI becomes zero and comes to 0.01 and 0.01 in Harare rural and high-density areas respectively. Figure 6-8 provides a clear analysis of relationship between cut-offs and k-values.

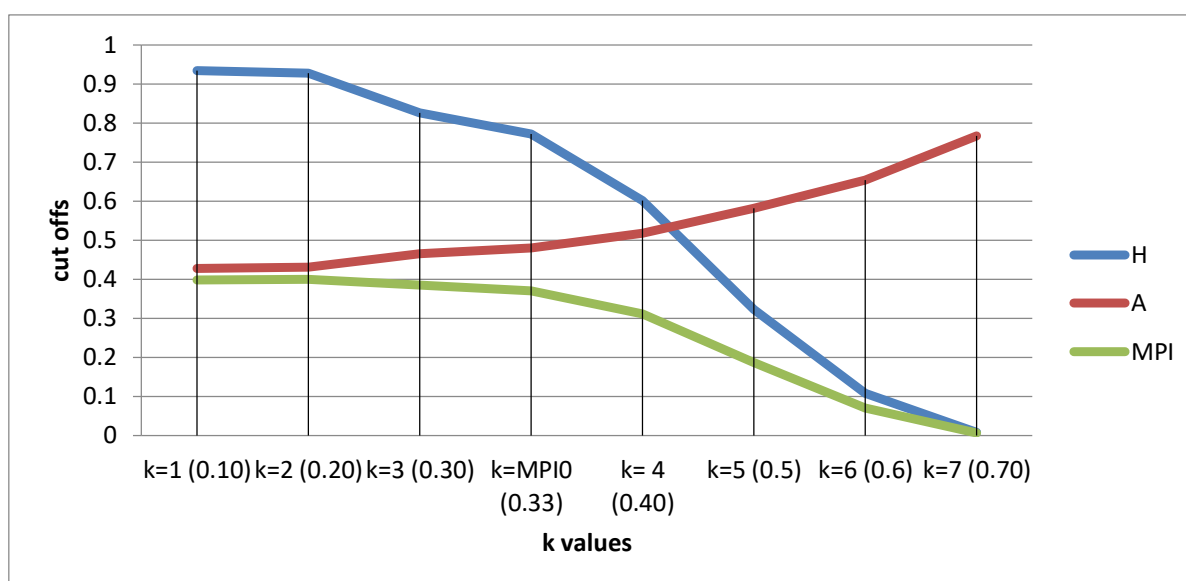


Figure 6-8: Relationship between cut-offs and cut-off k values

Source: Researcher's own calculations using survey data

Poverty intensity increases with cut offs while poverty head count decreases with poverty cut offs. MPI decreases with increase in poverty cut offs and generally the MPI is strongly determined by head count. Cut off of $k=1$, gives highest H and lowest A. At $k=1$, MPI is at its highest as well. As cut-offs, k increases up to $k=7$, H and MPI approaches zero which depicts an inverse relationship.

6.4.2 Harare Province Poverty Vulnerability

Poverty vulnerability is a critical construct to poverty analysis as it offers information on households likely to be pushed into poverty although they are currently non-poor (Pritchett, 2010). Table 6-23 provides the poverty vulnerability in Harare province.

Table 6-23: Harare Poverty Vulnerability

	Location: P<0.01 the variation across location is statistically significant									
	Harare Rural		High density		Medium Density		Low density		Total	
Household categories	N	%	n	%	n	%	n	%	n	%
Not Poor	0	0.0%	1	0.4%	2	3.6%	3	4.9%	6	1.5%
Poor (>33% deprivations)	52	96.3%	193	83.9%	28	50.9%	22	36.1%	295	73.8%
Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Source: Researcher's own calculations using survey data

The results in Table 6-23 indicate that 73.8 households are overall vulnerable to poverty for the poverty cut off between above 33% across all locations in Harare province. The most vulnerable households are located in Harare rural which had poverty vulnerability of 96.3%. High density has poverty vulnerability of 83.9% while medium density shows vulnerability of 50.9% and low density stands at 36.1%. The findings confirm *a priori* expectations that rural households are the most vulnerable group to poverty and that this vulnerability decreases as we move from households in high density to low density households.

6.5 DURATIONAL URBAN POVERTY FOR HARARE PROVINCE

This section addresses objective 2 of the study which was designed to determine the durational urban poverty for Harare province. The study analyses the dynamics of poverty in Harare province using assets index for the period 2010 to 2020. Using assets index, income or any other statistical measure of poverty is recommended when developing durational poverty measures that investigate the dynamics of poverty for periods extending over a decade (Bane & Ellwood, 1986:2).

The study asked households to establish the period of assets ownership hence the results are used to develop an asset index to determine durational poverty through the adjusted FGT model. The asset index used in this study was made of 15 assets which were allocated same weights (1/15) for 10-year period as shown in Table 5-4 in Chapter 5. In section 5-4 the asset index was derived from analysing a 10-year period in which households indicated the year they started owning an asset or conversely, the period the household did not have the specific asset. Table 6-24 provides findings on relationship between asset ownership and poverty.

**Table 6-24: Durational poverty based on asset ownership, poverty cutoff, Z= 75%, P α
All in Poverty, by year**

Asset Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
P ₀ (H)	20.5	26.0	28.0	31.0	32.5	38.3	49.3	53.5	59.3	65.5	69.5
P ₁ (Poverty gap)	5.99	7.92	8.6	9.1	9.8	11.2	14.9	16.2	18.2	21.1	23.1
P ₂ (Severity)	2.47	3.60	3.95	4.01	4.40	4.90	6.70	7.20	8.10	9.53	10.6

Source: Researcher's own calculations using survey data

Poverty head count (P₀) increased for the entire period from 2010 to 2020. Prior to 2014, poverty rates were less than the MPI₀H but after 2015 poverty rates soared higher. P₁ is increasing over the entire period but remains less than MPI₀H. Poverty severity, P₂ is also increasing over the entire period but remains less than both P₀ and P₁ as shown in Figure 6-9 below:

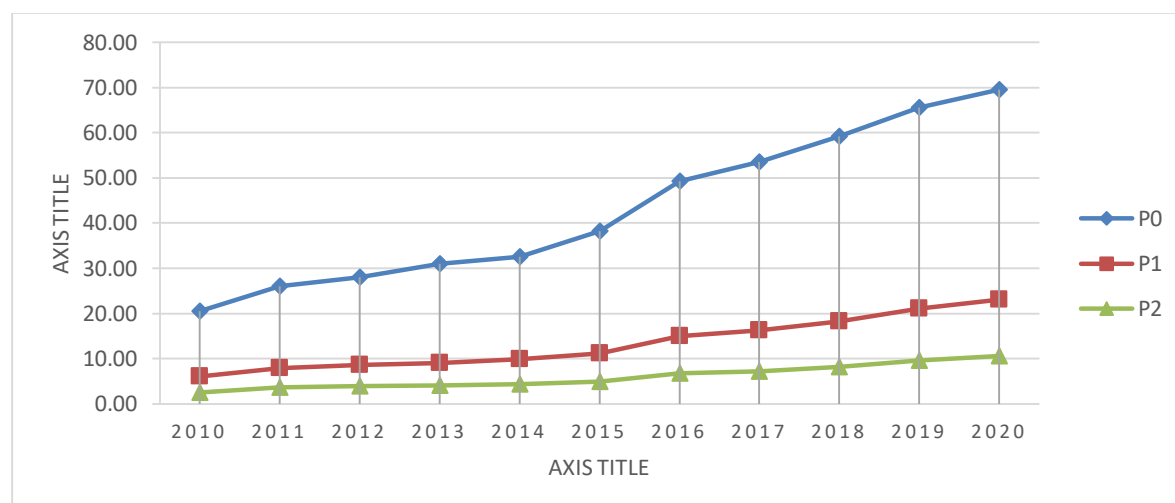


Figure 6-9: Analysis of P0 over time

Researcher's own calculations using survey data

6.6 DECOMPOSITION OF DURATIONAL POVERTY BY SUBGROUPS

Head count poverty derived from asset index increases over time across all locations but mostly in high density wards. Table 6-25 below indicates poverty rate by location.

Table 6-25: Poverty rate (P_0) analysis by location over time

Po	010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
H Rural	.02	.04	.049	.03	.05	.07	.09	.17	0.2	.278	.296
High density	.165	.243	.261	0.3	.322	.387	.535	.574	.635	.713	.761
M Density	.309	.364	0.4	.436	.436	.527	.564	.6	.655	.709	.745
Low density	.426	.426	.443	.475	.475	.508	.623	.656	.672	.721	.754
Total	.205	.26	.278	.31	.325	.383	.493	.535	.593	.655	.695

Source: Researcher's own calculations using survey data

The information provided in Table 6-25 can be presented in line graphs as shown in Figure 6-10 below:

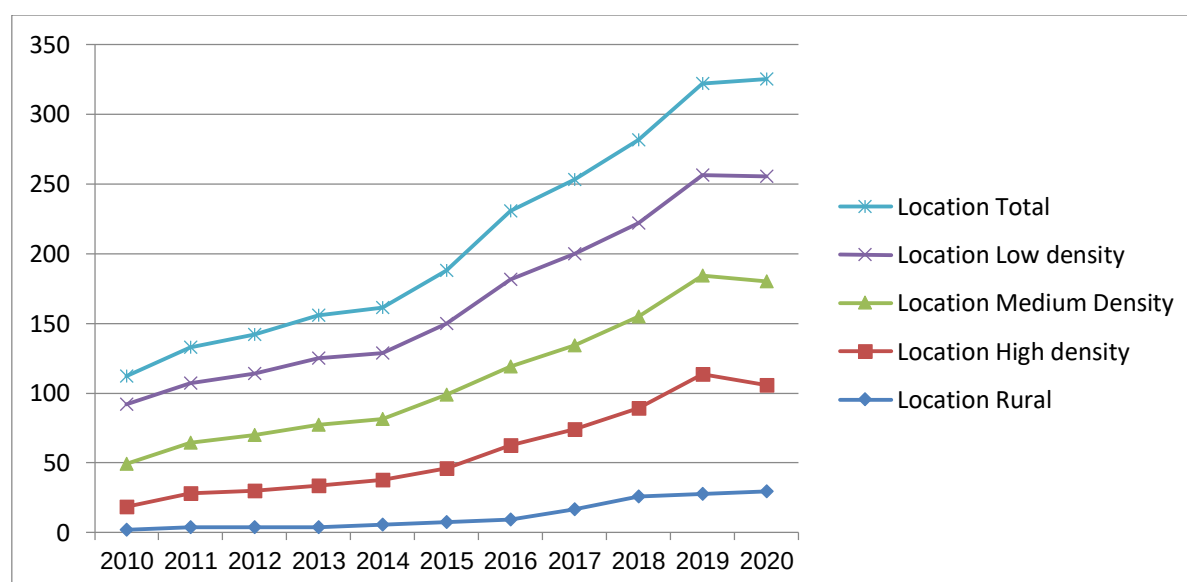


Figure 6-10: Poverty rate (P_0) analysis by location and time

Source: Researcher's own calculations using survey data

6.6.1 Analysis by location (P_1)

P_1 represents poverty changes over time. The study found that poverty gap increases throughout the study for the period 201-2020 across all locations. Medium density indicates highest poverty gap in 2020 at (34.6%). The full analysis of poverty gap is shown in Table 6-25.

Table 6-26: Poverty gap (P₁) over time from 2010-2020

P1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Rural	0.001	0.005	0.005	0.45	0.28	0.17	0.19	0.28	0.39	0.59	0.66
High density	0.38	0.55	0.60	0.66	0.76	0.87	0.131	0.142	0.167	0.202	0.224
Medium Density	0.104	0.134	0.145	0.164	0.173	0.210	0.262	0.287	0.304	0.329	0.346
Low density	0.154	0.186	0.187	0.193	0.196	0.204	0.240	0.245	0.259	0.274	0.303

Source: Researcher's own calculations using survey data

6.6.2 Poverty severity (P₂) analysis by location

Poverty severity (poverty gap squared) over time has worsened across all locations in Harare. However, poverty severity is highest in medium density locations. Rural location (ward 1) had 33% in 2010 but poverty severity decreased for the period 2011 to 2018 to between 11% and 16%. Poverty analysis by location is presented in Table 6-27.

Table 6-27: Poverty severity (P₂) analysis by location

P2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Rural	0.33	0.11	0.10	0.2	0.17	0.22	0.5	0.7	0.8	0.16	0.58
High density	0.12	0.19	0.20	0.22	0.26	0.29	0.45	0.49	0.61	0.78	0.89
Medium Density	0.45	0.67	0.72	0.38	0.89	0.112	0.149	0.167	0.174	0.188	0.199
Low density	0.075	0.102	0.102	0.107	0.109	0.110	0.131	0.132	0.140	0.147	0.163
Total	0.025	0.036	0.037	0.040	0.044	0.049	0.067	0.072	0.081	0.095	0.106

Source: Researcher's own calculations using survey data

6.7 MULTIVARIATE BINARY LOGISTIC REGRESSION ANALYSIS

Logistic regression is used to investigate the drivers of circumstantial urban poverty in Harare province falling under objective 5 of the study. The design of logistic regression model is explained in section 5.7.1-5.7.4 in Chapter 5. The logistic regression was performed at indicator level so that the study could determine which indicators drive poverty. The following segments explain the dependent and independent variables for the study in 6.5.1 and 6.5.2 respectively.

6.7.1 Dependent Variable of the logistic model

The dependent variable of the study is each household's multidimensional poverty index (MPI₀HH). In order to derive the general MPI₀H in Table 6.13, the study first calculated each household's multidimensional poverty (MPI₀HH) for 400 households included in this study.

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province

MPI₀HH is here used as dependent variable for logistic regression. Section 5.7.1.3 in Chapter 5 clearly explains how the MPI₀H for household is derived using survey data.

6.7.2 Independent variables of the logistic model

Independent variables (regressors) of the study are the 36 indicator variables across the 7 dimensions. The indicators are shown in Table 5-1 in Chapter 5 of the study. The determination of the indicators is also explained in depth in section 5-6, which highlights the stages undertaken in designing a new multidimensional poverty measure. Furthermore, Table 5-1 presents the dimensions and indicators, justifying why they were chosen for this study. In section 5.7.1.4 the researchers clarified how the independent variables of the study were determined. Each of the 36 indicators dummy for the indicator is 1 when household has likelihood of being poor on the indicator and 0 otherwise.

6.7.3 Coefficients VIF values of MPI indicators

Before regression analysis was performed, the study tested multicollinearity using Variance of Inflation factor (VIF) values as recommended by Curto & Pinto, (2011:1); Daoud, (2017:4). Presence of multicollinearity inflates the values of the variances of the coefficients in the study making the objective of determining drivers of poverty a fallacy. The use of VIF in this study is explained in diagnostic tests in section 5.7.2.1, illustrating how to detect and deal with presence of multicollinearity in data set.

The results of VFI on significant indicators shows that there is little evidence of multicollinearity given VIF range of 1.1-2.2 on all indicators. The VIF range of 1.1-2.2 is within the rule of thumb range ($0.25 < \text{VIF} < 2.5$) as advised by Curto & Pinto, (2011); Daoud, (2017); Rath, (2017) and as provided in section 5.7.2.1. Tolerance of the indicators is above 0.25 hence the study rejects the assumption that there is multicollinearity. Table 6-28 presents Hosmer and Lemeshow Test results. The full results of the indicators of multicollinearity are provided in Annexure K.

Table 6-28: Hosmer and Lemeshow Test

Chi-square	Df	Sig.
1.087	8	0.998

Source: Researcher's own calculations from survey data

The Hosmer and Lemeshow Test measures the goodness of fit of the logistic regression model. The importance and derivation of goodness of fit in this study is explained in section 5.7.2.2.

The overall Hosmer and Lemeshow Test of 0.998 indicates that the model is a good fit (99.8%) in explaining the probability of multidimensional poverty in Harare province (pvalue 0.998>0.05). The model's seven observed dimensions match the expected poverty likelihood. The study now proceeds to model the data logistic regression.

6.7.4 Estimated model

Using the indicators provided in section 5.6.2, Table 5-1, the study proceeded to estimate the logistic model of the study. From the 13 significant indicators of the study's 36 indicators defined in Chapter 5, Table 5-1, the study predicted model is shown as:

$$P(MPI_{0HH}(1/x)) = 5.440 + B_1 (5.440) + B_2 (4.642) + B_3 (2.186) + B_4 (5.646) + B_5 (-3.520) + B_6 (2.592) + B_7 (5.646) + B_8 (4.371) + B_9 (5.244) + B_{10} (4.459) + B_{11} (4.301) + B_{12} (3.676) + B_{13} (5.681) + \mu_{it}.$$

MPI_{0HH} is the multidimensional poverty index for each household derived using H*A. MPI_{0HH}

B_i ; ($B_1, B_2, B_3, \dots, B_{13}$) are significant indicators of the 36 indicators ($B_1, B_2, B_3, \dots, B_{36}$) provided in section 5.5.3 and explained further in Table 6.23 in section 6.5.9.

Prob ($MPI_{0HH} = 1/X$) is the likelihood that there are multidimensionally poor

Prob ($MPI_{0HH} = 0/X$) is the probability the household will not be multidimensionally poor

Error-term μ_{it} follows normal distribution, independent, identically distributed (NIID) $\sim (0, \delta^2)$.

6.7.5 Interpretation of the logistic model results

Where the dependent variable MPI_{0HH} is defined in section 6.7.1 and independent variables are as defined in section 6.7.2 above, the interpretation of the logistic regression results is methodically provided in section 5.7.1.1, it is noted in that section that the interpretation of the results are either in odds ratios or in logit model.

6.7.6 Indicators in the MPI_{0HH}

Of the 36 indicators provided in Table 5-1, only 27 were associated with predicting likelihood of poverty. However, 23 indicators are not significant predictors of poverty although they are associated with the outcome variable. With the Hosmer-Lemeshow test, the logistic model is

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considered a perfect model, ($0.998 > 0.05$). Table 6-29 provides the Omnibus Tests of the model coefficients.

Table 6-29: Omnibus Tests of Model Coefficients

	Chi-square	Df	Sig.
Step	396.510	26	0.000
Block	396.510	26	0.000
Model	396.510	26	0.000

Source: Researcher's own calculations using survey data

From Table 6-29, the Chi-square of the indicators is small meaning that it is statistically significant. The Omnibus test shows it is significant (0.000) hence the study rejects the null hypothesis as $H_0 = 0$. Chi-square (χ^2) test determined that the data is statistically significant between the observed variance and the unexplained variance, P-Value = 0.000 < 0.05, $\alpha = 0.05$.

6.7.7 Indicators Model Summary of MPI₀HH

The model explains 92.0% of the variability from the Nagelkerke R value of the 27 variables. A higher Nagelkerke R value signifies that the model indicators effectively explain poverty in Harare province. Coefficient of determinations indicates that the indicators in the model explain 92% of variability in data. Cox & Snell R Square which is based on the log likelihood and this shows that the data is a good fit in estimating drivers of poverty in Harare province. The full model summary for the study is given in Table 6-29.

6.7.8 Model: Indicators Summary

Table 6-30: Model Summary

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
64.014 ^a	0.629	0.920

Source: Researcher's own calculations using survey data

The -2 Log likelihood measures the goodness of fit of the model. A higher -2 Log likelihood of 64.014 indicates the model is a good fit in explaining the dependent variable and if we keep adding variables to the model above, the goodness of fit of the model improves. The study having been satisfied with model's goodness of fit proceeded to run regression model and the logistic regression model results are shown in Table 6-30.

Table 6-31: Significant indicator variables of the model

Model Significant Indicators	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
B₁ : Years not attending school	5.440	2.065	6.938	1	0.008	230.423	4.023	13198.417
B₂ : School materials/needs affordability	4.642	1.414	10.782	1	0.001	103.725	6.496	1656.272
B₃ : Distance (Km) from nearest health facility	2.186	1.053	4.311	1	0.038	8.896	1.130	70.019
B₄ : House size	5.646	1.544	13.370	1	0.000	283.219	13.731	5841.668
B₅ : Primary source of cooking fuel	-3.520	1.532	5.276	1	0.022	0.030	0.001	0.597
B₆ : Employment status of household head	2.592	1.094	5.620	1	0.018	13.360	1.567	113.920
B₇ : another household are employed	5.646	1.394	16.406	1	0.000	283.046	18.426	4347.841
B₈ : Asset ownership	4.371	1.349	10.494	1	0.001	79.143	5.621	1114.340
B₉ : Land ownership	5.244	1.916	7.494	1	0.006	189.369	4.434	8087.062
B₁₀ : nature roads infrastructure	4.459	1.316	11.484	1	0.001	86.365	6.553	1138.244
B₁₁ : Pollution	4.301	1.340	10.299	1	0.001	73.780	5.335	1020.375
B₁₂ : Skip meals	3.676	1.212	9.206	1	0.002	39.500	3.675	424.572
B₁₃ : Borrowed food, or rely on help from friends	5.681	1.368	17.253	1	0.000	293.326	20.096	4281.389
Constant	-31.510	7.342	18.422	1	0.000	0.000		

Source: Researcher's own calculations using survey data set

The standard errors of the model are statistically different from zero implying they are significant. For this reason, we reject the null hypothesis that variance squared is zero ($H_0 = 0$) and accept the alternate hypothesis that variance squared is different from zero ($H_1 \neq 0$). The standard errors which are the sum of the square root of the variance (estimated standard deviation) of the sample measure the regression coefficient precision and enable construction of confidence interval around the mean. A total of 13 indicator variables are statistically significant while 23 are statistically insignificant. These have been dropped and are not analysed any further.

Multidimensional poverty in Harare is affected by 13 indicators across 7 dimensions. Years of schooling is statistically significant ($p \leq 0.05$), in reducing probability of multidimensional poverty in Harare and so is the availability of school materials and other school needs by children. The variable 'years not attending school' in continuous Exp(B) can thus be put as $[230.423 - 1] * 100 = 22,942.3$ (95% C.I 4.023, 13,198.417). This implies that for an additional number of school age not attending school, the odds of multidimensional poverty increase are 22,942.3%. Wald X^2 on non-school attendance by children of school going age (5-16 years) of 6.938 implies that the indicator is a strong determinant of poverty assuming other indicators remain unchanged. SPSS annotated output indicates that a unit decrease in affordability on school materials/needs increases poverty by $[103.725 - 1] * 100 = 10,272.5\%$ (95% C.I 6.496, 1,656.272). The Wald – Chi Squared statistic of 10.782 indicates that holding other indicators constant, unaffordability of school materials would increase the probability of poverty by 10.782. The odds ratios of years of schooling causing poverty falls within range 6.496 to 1,656.272. Education indicators have been determined as a strong force in explaining determinants of multidimensional poverty (Sen, 1992& 2001; Allkire & Sumner, 2013; Thapa, 2013).

Distance travelled to access health care services is statistically significant $p \leq 0.05$ which is ($0.038 \leq 0.05$) in explaining multidimensional poverty in Harare province. A unit increase in distance (Km) from nearest health facility increase poverty odds by 8.896 units or by $[8.896 - 1] * 100 = 7.896\%$ (95% C.I 1.130, 70.019), the significance of the indicator was further confirmed by Wald Chi Squared Test of 4.311 and statistical significance (Sig 0.038) which implies $0.038 < 0.05$ given $\alpha = 0.05$. The Wald statistic of 4.311 means that when holding other indicators of the model constant, distance travelled would increase poverty by 4.311. The odds ratios of distanced travelled leading to poverty ranges between (1.130, 70.019). Distance to health facility was also found to be a significant determinant of multidimensional poverty by Haughton and Khandker, (2009) and UNDP uses Health dimension for its MPI however, the indicators used by UNDP for health dimensions were found to be insignificant in explaining multidimensional poverty in Harare province. Insignificance of UNDP indicators in this model justifies why new and more indicators should be integrated as poverty is not static and circumstances and convictions of poverty change from one society to the other.

Household house size is a significant indicator in explaining probability of households getting into poverty (Sig 0.000). Exp (B) for household size of 283.219 means a unit increase in size of a household would increase probability of household poverty by 283.219, which in percentage terms can be put as follows; $[283.219 - 1] * 100 = 282.219\%$ (95% C.I 13.731, 5841.668). A percentage increase in household size would increase odds of poverty in that household by

282.219%. The relationship between household size and poverty determined by the study model makes economic sense as increase in household size reduces share of each person in the family on finite resources the family have probability to acquire. Wald statistic of household size also confirms the significance of the indicator in explaining the likelihood of poverty, household size increases the probability of household poverty by 13.370 ceteris paribus, other indicators specified. The range for odds ratio of household size causing poverty falls within lower and upper bounds 13.731 and 5841.668 respectively.

Primary source of cooking fuel is determined to have a significant effect on poverty (Sig 0.022). The Exp (B) of 0.030, which is below 1 indicates increase in primary sources of fuel have a negative probability on poverty. A unit increase in primary sources of cooking fuel increases the probability of reducing poverty by 0.030 or conversely, a unit decrease in sources of cooking fuel increases poverty by $1 \div 0.030 = 33.33$. Exp (B) for primary source of cooking in percentage terms can be shown as $[1-0.030] * 100 = 97\%$ (95% C.I 0.001, 0.597). Poor cooking fuel sources increase poverty cooking fuel indicator is one of the indicators being used by UNDP for its multidimensional poverty measurement for UNDP Standards of living dimension. The odds ratios of primary source of cooking fuel leading to poverty ranges from 0.001 (lower bound) to 0.597 (upper bound).

The results show that employment of household heads (Sig 0.018) reduces probability of multidimensional poverty in Harare households. The Exp (B) of the indicator is 13.360, which means that a unit increase in employment of household heads indicator will increase the probability of reducing poverty by 13.360 units. Alternatively, this can be presented in percentage; Exp (B) $[13.360-1] * 100 = 1.236\%$ (95% C.I 1.567, 113. 920). Households with employed household heads are less likely to fall into poverty than households with unemployed household heads. Furthermore, households with other employed household members have higher probability of not being poor (Sig 0.000). The Exp (B) of 283.046 means a unit increase in employment of other household members besides the head or spouse, increases the likelihood of non-poor by $[283.046-1] * 100 = 28,204.6\%$ at (95% 18.426, 4347.841).

The indicator asset ownership was found to be significant (Sig. 0.001) in explaining multidimensional poverty. The Exp (B) of the indicator of 79.143 implies a percentage increase in asset ownership would increase the likelihood of non-poor by $[79.143-1] * 100 = 7,814.3\%$ at (95% (C.I 5.621, 1114.340), simply a percentage increase in asset ownership would increase household non-poverty by 7,814.3%. Study found that households in Harare with some form of assets ownership are likely less prone to poverty than those without assets. Previous studies

(Adepoju, 2018; Egger *et al.* 2020) also reported household assets ownership to be a significant factor in reducing the probability of households falling into multidimensional poverty.

Land ownership was found to be a contributing indicator (Sig 0.006) to the likelihood of households in Harare being poor. Exp (B) for the indicator of 189.369 imply that a percentage increase in land ownership by household will increase probability of non-poor by $[189.369-1] * 100 = 18,836.9\%$ at (95% C.I. 4.434, 8087.062). The significance of land ownership in increasing likelihood of ending poverty is also explained by Wald statistic of 7.494, which is statistically different from zero hence the null hypothesis is rejected. In other words, it can be deduced from the Exp (B) statistic that decrease in land ownership would increase poverty by $(1 \div \text{Exp(B)}) = (0.0052807)$.

The indicator 'nature roads infrastructure' has been determined by the model of the study to be significant (Sig. 0.001) in explaining multidimensional poverty among Harare province residents. The Exp(B) of nature roads infrastructure implies that a percentage increase and or improvement of the indicator would increase the probability of reducing poverty by $[86.365-1] * 100 = 8,536.5\%$ (95% C.I. 6.553, 1138.244). The significance of nature roads infrastructure in explaining the probability of poverty among households in Harare is further supported by Wald statistic of 11.484, which is statistically different from 0, hence, indicates that the indicator has a bearing on likelihood of poverty. Nature of roads infrastructure was found to be a strong determinant indicator for multidimensional poverty in Harare province and was never used in previous multidimensional poverty measures for Zimbabwe, Harare.

Pollution was found to be a strong positive (Sig. 0.001) which implies $p \leq 0.05$ is achieved or simply $(0.001 < 0.05)$ determinant indicator to the probability of poverty among Harare households. Pollution indicator's Exp (B) statistic value of 73.786 means a unit increase in pollution would increase poverty by 73.786, and when converted to percentage terms it shows that a unit increase in pollution would increase poverty by 7,278.6% (95%CI 5.335, 1020.375). The significance of pollution to increasing probability of poverty was confirmed in earlier studies that environmental poverty such as pollution have strong bearing on the total poverty faced in communities (Shah, 2009; Thiry *et al.* 2018).

The indicator 'skipping of meals' was found to be a significant indicator (0.002) of multidimensional poverty in Harare province. Exp(B) of skipping of meals shows that a percentage increase in skipping of meals would increase poverty by $[39.500-1] * 100 = 3.850\%$ at (95% C.I. 36.75, 424572). The Wald statistic of 9.206 means that it also concurs that skipping of meals is a significant indicator of multidimensional poverty. The findings are in line with earlier

calculations that forced skipping of meals due to inadequate resources resulted in 30% occurrence of malnutrition in poor households in Kenya (Song & Imai, 2019).

Borrowing of food and or reliance on help from friends was a positive significant (Sig. 0.000) multidimensional indicator in Harare province. Exp(B) for the indicator of 293.325 means a percentage increase in food borrowing would increase poverty by $[293.326-1] * 100 = 29,233.6\%$. The odds ratios for food borrowing causing poverty ranges between 20.096 to 4281.389. This means the lowest (lower bound) unit increase in borrowing food increasing poverty is 20.096, while the maximum odds ratio for food borrowing increasing poverty is 4281.389. The elastic range of the indicator indicates the importance of the variable to explaining likelihood of poverty among households in Harare province. Food borrowing indicates insufficiency in food, meaning the presence of hunger and is poverty itself. UN (1975) found similar results on the significance of hunger to poverty and posited that:

Every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop fully and maintain their physical and mental faculties. (...) Accordingly, the eradication of hunger is a common objective of all the countries of the international community, especially of the developed countries and others in a position to help. (United Nations. 1975)

UN assertions were further supported by World Food Summit (WFS) in November 1996 when it posited that “Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life”, and lack of enough food cause starvation which is a serious form of poverty, (Sen, 1981).

6.7.9 Dimension: Cut-off for deprivation is 1/3 of each dimension (1/3 of 1/7)

Table 6-32: Education Dimension

Poor=1 Non poor=0		Harare Locations									
		Rural		High density		Medium Density		Low density		Total	
		N	N %	N	N %	N	N %	N	N %	N	N %
Education dimension	Not Poor	23	42.6%	156	67.8%	41	74.5%	45	73.8%	265	66.3%
	Poor	31	57.4%	74	32.2%	14	25.5%	16	26.2%	135	33.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Source: Researcher's calculations using survey data

In section 5.6.4-5, the study advised how cross cut offs are used on each indicator as well as indicator cross cut-offs. As a way of detailing how the cross cut-offs are used, Table 5-2

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highlights the important aspects. Table 6-31, shows that the Pearson Chi test for education of 0.001 means the dimension is statistically significant at 0.05%. The results show that the 33.8 % of the respondents are education poor while 66.3% of respondents are education non-poor. Harare rural respondents are education poor (57.4%) while high density respondents are 32.2% poor in this very dimension. Medium density and low density have 25.5% and 26.2% poor on education dimension. The findings indicate that rural Harare respondents have higher poverty when compared to any of the urban dwellers. The findings are in line with expectations given Zimbabwe has high literacy.

Table 6-33: Health dimension

Poor=1 Non poor=0		Harare Locations									
		Rural		High density		Medium Density		Low density		Total	
		N	N %	N	N %	N	N %	N	N %	N	N %
Health dimension	Not Poor	23	42.6%	142	61.7%	36	65.5%	52	85.2%	253	63.2%
	Poor	31	57.4%	88	38.3%	19	34.5%	9	14.8%	147	36.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Source: Researcher's calculations using survey data

The dimension indicates that overall, 36.8% are poor on this dimension. Harare rural residents are 57.4% poor on this dimension. High density, medium density and low-density suburbs are 38.3%, 34.5% and 14.8% poor on the dimension.

Table 6-34: Standards of Living Dimension

Poor=1 Non poor=0		Harare Locations									
		Rural		High density		Medium Density		Low density		Total	
		N	N %	N	N %	N	N %	N	N %	N	N %
Standard of Living	Not Poor	36	66.7%	205	89.1%	53	96.4%	58	95.1%	352	88.0%
	Poor	18	33.3%	25	10.9%	2	3.6%	3	4.9%	48	12.0%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Source: Researcher's calculations using survey data

On standards of living, 12% are poor on the dimension and, as expected, the rural dwellers have the highest poverty (33.3%) followed by high density (1.9%), medium density (3.6%) and lastly low density (4.9%). The standards of living in medium density are marginally higher than low density.

Table 6-35: Economic Security Dimension

Poor=1 Non poor=0		Harare Locations									
		Rural		High density		Medium Density		Low density		Total	
		N	N %	N	N %	N	N %	N	N %	N	N %
Economic Security	Not Poor	1	1.9%	28	12.2%	13	23.6%	11	18.0%	53	13.3%
	Poor	53	98.1%	202	87.8%	42	76.4%	50	82.0%	347	86.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Source: Researcher's calculations using survey data

The overall poverty for economic security for the dimension indicates high poverty of 86.8%. The dimension indicates that rural Harare residents have 98.1% economically poor, while high density has 87.8% poverty on this dimension. Medium density recorded 76.4% and low density has 82%. The dimension indicates that majority of citizens of Harare province are deprived of the economic dimension.

Table 6-36: Empowerment and Participation Dimension

Poor=1 Non poor=0		Harare Locations									
		Rural		High density		Medium Density		Low density		Total	
		N	N %	N	N %	N	N %	N	Column N %	N	N %
Empowerment & Participation	Not Poor	3	5.6%	3	1.3%	1	1.8%	2	3.3%	9	2.3%
	Poor	51	94.4%	227	98.7%	54	98.2%	59	96.7%	391	97.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Source: Researcher's calculations using survey data

The dimension indicates that 97.8% of Harare respondents are poor on the empowerment and participation dimension. The highest poverty on the dimension is recorded in high density wards, medium density suburbs recorded 98.2%, low density wards recorded 96.7% and Harare rural ward 1 recorded the least poverty of 94.4% on the dimension.

Table 6-37: Environment and Public Infrastructure Dimension

Poor=1 Non poor=0		Harare Locations									
		Rural		High density		Medium Density		Low density		Total	
		N	N %	N	N %	N	N %	N	N %	N	N %
Environment and Public Infrastructure	Not Poor	4	7.4%	13	5.7%	12	21.8%	22	36.1%	51	12.8%
	Poor	50	92.6%	217	94.3%	43	78.2%	39	63.9%	349	87.3%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Source: Researcher's calculations using survey data

The dimension indicates that 87.3% are deprived. The biggest poverty on the environment and public infrastructure dimension was recorded in Harare high density wards 92.6%. Harare rural recorded 92.6% poverty, 78.2% for medium density and 63.9% for low density. The breakdown of the total poverty for this dimension across the four locations is shown below:

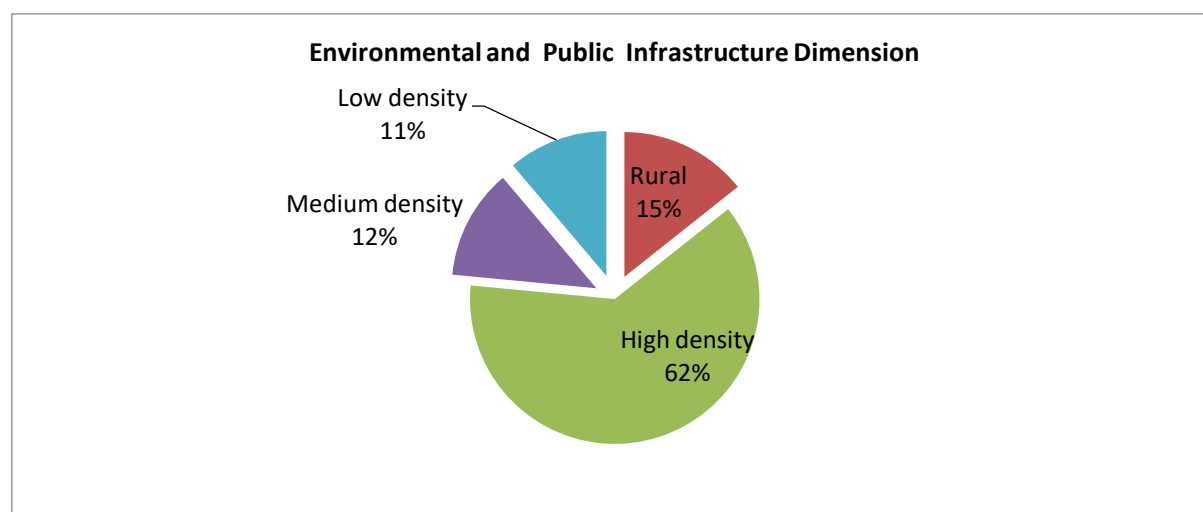


Figure 6-11: Breakdown of environmental and public infrastructure over location

Source: Researcher's calculations using survey data

High density has the highest share of the total poverty while Harare rural has 15% of the total poverty. Medium density and low density recorded 12% and 11% respectively.

Table 6-38: Food insecurity and adaptation

Poor=1 Non poor=0		Harare Locations									
		Rural		High density		Medium Density		Low density		Total	
		Count	Column N %	Count	Column N %	Count	Column N %	Count	Column N %	Count	Column N %
Food insecurity and adaptation	Not Poor	21	38.9%	130	56.5%	35	63.6%	51	83.6%	237	59.3%
	Poor	33	61.1%	100	43.5%	20	36.4%	10	16.4%	163	40.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Source: Researcher's calculations using survey data

The dimension shows that 40.8% people in Harare province are deprived of the dimension. As expected, the rural residents in Harare face most poverty (61.1%) on the dimension. High density residents face 43.5% poverty on the dimension whilst in medium density and low-density poverty on the dimension is 36.4% and 16.4% respectively.

6.8 PERCEPTIONS OF MULTIDIMENSIONAL POVERTY IN HARARE PROVINCE

Perceptions of poverty are empirical objective number 4 of the study as outlined in section 1.3.3. The methodology used to determine poverty perceptions for Harare province is shown in section 5.7 in which perceptions were grouped into individualistic, structural and fatalistic categories.

6.8.1 Model dependent variable

Each household's multidimensional poverty index is used as the dependent variable of the model. The model dependent variables are fully explained in section 5.8.1.1.

6.8.2 Model independent variable

The independent variables of the perceptions of poverty are the 14 forms of perceptions which are fully explained in section 5.8.1.2 and given in Table 5-5.

6.8.3 Model Omnibus Tests

Table 6-39: Omnibus Tests of Model Coefficients

	Chi-square	Df	Sig.
Step	106.261	14	0.000
Block	106.261	14	0.000

Model	106.261	14	0.000

Source: Researcher's own calculations from survey data

The Chi-square of the indicators is small indicating that it is statistically significant. The Omnibus test shows it is significant (0.000) hence the study rejects the null hypothesis as $H_0 = 0$. Chi-square (χ^2) test determined that the data is statistically significant between the observed variance and the unexplained variance, P-Value = 0.000 < 0.05, $\alpha = 0.05$.

6.8.4 Pearson test for perceptions of poverty

The Pearson test for perceptions of poverty is attached in Annexure N. The Pearson test results show that all predictors are statistically significant in explaining poverty perceptions in Harare province. Hence, the study rejects H_1 ; ($H_0 = 0$, reject H_1).

6.8.5 Model specifications

The model for perception of poverty was procedurally explained in section 5.8.3 in the previous chapter. The mathematical model is provided as follows:

$$Index_i = B_0 + B_1(H1) + B_2(H2) + B_3(H3) + B_4(H16) + B_5(H5) + B_6(H6) + B_7(H7) + B_8(H8) + B_9(H9) + B_{10}(H10) + B_{11}(H11) + B_{12}(H12) + B_{13}(H13) + \mu_{it}$$

where $Index_i$ is the multideimensional poverty index for household i , where, ($i = 1, 2, \dots, n$), where n maximum value is 400. Index=1 for poor, 0 otherwise.

$B = (B_0, B_1, \dots, B_{13})$ are the coefficients of the dummy variables

$H = (H1, H2, H3, H4, H16, H5, H6, H7, H8, H9, H10, H11, H12)$ are the independent variables which take the value of 1 if households agree that they perceive the variable to cause poverty and 0 otherwise. The list of independent variables of perceptions is provided in Table 5-5. Subsequently the relationship between poverty and the perception of poverty variables is now indicated in Table 6-39 below:

Table 6-40: Logistic regression Model: Variables in the equation

	B	W	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
					Lower	Upper
H1: They lack the ability to manage money (1/0)	.203	.292	.589	1.225	.587	2.556
H2: They waste their money on inappropriate items (1/0)	-.659	2.918	.088	.518	.243	1.102

	B	W	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
					Lower	Upper
H3: They do not actively seek to improve their lives. (1/0)	-.486	1.727	.189	.615	.298	1.270
H16: Poverty is inevitable and its part of life? (1/0)	.810	5.847	.016*	2.248	1.166	4.336
H4: They are exploited by rich people (1/0)	.490	2.052	.152	1.632	.835	3.191
H5: The society lacks social justice (1/0)	.763	3.957	.047*	2.145	1.011	4.548
H6: Distribution of wealth in the society is uneven (1/0)	.034	.009	.923	1.035	.519	2.062
H7: Poor families lack opportunities. (1/0)	-.541	2.146	.143	.582	.282	1.201
H8: They live in places with no opportunities (1/0)	.829	6.326	.012*	2.291	1.201	4.371
H9: They have bad fate. (1/0)	-.275	.197	.657	.759	.226	2.558
H10: They have bad luck. (1/0)	1.684	5.183	.023*	5.390	1.264	22.982
H11: They have encountered misfortunes. (1/0)	-1.421	12.58	.000*	.242	.110	.529
H12: They are not motivated because of welfare. (1/0)	-.171	.188	.665	.843	.389	1.826
H13: They are born inferior. (1/0)	.375	.474	.491	1.455	.500	4.228
Constant	.780	4.500	.034	2.182		

* Significant at the 0.01 level

Source: Researcher's own calculations from survey data

The model shows that 5 variables are significant in explaining perceptions of the likelihood of poverty in Harare province. There is perceived likelihood of poverty if society lacks social justice, poor people live in areas without opportunities, if people have back luck and finally if they have encountered misfortunes in their lives. Significant determinants of poverty perceptions are shown in the table below.

Table 6-41: Significant determinants of poverty perceptions

Poverty Perceptions	Logistic significant indicators
Individualistic	H16: Poverty is inevitable and it is part of life?
Structural	H5: The society lacks social justice
	H8: They live in places where there are not many opportunities
Fatalistic	H10: They have bad luck.
	H11: They have encountered misfortunes.

Source: Analysis of logistic significant variables from survey data

Poverty perceptions in Harare province are explained significantly by individualistic perceptions, structural and fatalistic perceptions. The odds that the poor will explain their poverty as a result of individualistic perceptions of poverty being inevitable and part of life is 2.248 (p-value $0.016 < 0.05$) and structural perceptions: Poor people are more likely to point their poverty to the fact that; The society lacks social justice (p-value $0.047 < 0.05$) hence their poverty. There is high

probability that poor people in Harare province will explain their poverty as being caused by lack opportunities in places they live ($p\text{-value } 0.012 < 0.05$). Fatalistic perceptions; the poor are likely to point their poverty as being caused bad luck ($p\text{-value } 0.023 < 0.05$). Poverty among the poor in Harare is likely to be explained by the poor in the city as being from misfortunes encountered ($p\text{-value } 0.000 < 0.05$).

The Exp(B) for 'they have encountered misfortunes perceptions' of 2.248 indicates the dimension has an effect on the poverty perceptions model; poverty has 2.248 times higher chances of occurring than non- poverty as the individualistic perception of that they have encountered misfortunes perceptions increases (95% C.I. 1.166 to 4.226). Structural perceptions Exp(B) of that the society lacks social justice 2.145 indicates that the factor has an effect on the model; poverty has 2.145 times higher chances than non-poverty in the perceptions of the poor, an increase in Structural perceptions increases probability of poverty by 2.145 (95% C.I. 1.011-4.548). The Exp(B) for 'they live in places where there are not many opportunities' of 2.291 indicates that the probability of obtaining explanation from poor about their poverty is 2.291 units for every unit increase in poverty (95% C.I. 1.201-4.371). The poverty perception of 'they have bad luck' is likely to be expressed as a cause of poverty by the poor 5.390 times per unit increase in poverty while there are 0.242 odds that the poor will say their poverty is a result of misfortunes they encountered in their lives, 0.242 (95% C.I. 0.110-0.529).

The Wald for parameter individualistic perceptions of 'poverty is inevitable and it is part of life' is 0.292 meaning that when other regressors of perceptions parameters remain unchanged, the chances for higher poverty is 0.292 higher for poverty than non-poverty. The Wald parameter for Structural perceptions: the society lacks social justice is 3.957 meaning that when other significant perceptions parameters remain unchanged chances for higher poverty is 3.957 higher for poverty than non-poverty from this independent variable. The Wald statistic for: they live in places where there are not many opportunities of 6.326 indicates that when all other independent variables of the equation are held constant, improvement on the independent variable: they live in places where there are not many opportunities will reduce poverty by 6.326. The Wald statistic on: they have bad luck of 5.183 implying that when *ceteris paribus* holds on other independent variables of the model, a unit increase in luck would reduce poverty by 5.183. The final significant regressor of the model: they have encountered misfortunes gave a Wald statistic of 12.589 which means when all other determinants are held constant a unit improvement on the perception that: they have encountered misfortunes, will reduce poverty by

12.589. Standard errors of the model are statistically different from zero implying they are significant estimators.

6.9 DRIVERS OF POVERTY IN HARARE PROVINCE

The drivers of poverty in Harare province are spread across seven dimensions used in the study. In total, 13 drivers of poverty were established by the study. Drivers of poverty are closely related to existing theoretical and empirical discourse on poverty causes. The drivers were identified from the Multivariate Logistic model performed for circumstantial poverty for Harare province. The results indicate that inputs, flows and outputs are all drivers of poverty in Harare province and these are:

1. Dropout from school by children aged 5-16 years;
2. Non affordability of school materials/needs;
3. Long distance (Km) to the nearest health facility;
4. Small household house infrastructure;
5. Poor primary source of cooking fuel;
6. Unemployment of household heads
7. other household members not employed;
8. Household assets ownership
9. Non land ownership;
10. Rationing food consumption by adults
11. Poor roads infrastructure;
12. Pollution exposure;
13. Insufficient food: skipping meals and borrowing food or rely on help from friends.

Education was found to be a significant dimensional driver of urban poverty in Harare. The main indicator drivers of education poverty are (a) lack of school materials for school children and (b) school children aged between 5-16 years not attending school. A unit increase in the number of

school children aged 5-16 years not attending school increase urban poverty in Harare province by 5.440 units. Furthermore, one-unit increase in lack of education materials by school children, increases poverty by 4.7 units. School drop out for the age 5-16 years means that then they eventually attain employment age, they would be unemployable and if they are lucky to get employment they would have a poor marginal labour productivity hence they will earn wages not enough to cover human life basic needs and this would increase their probability of poverty and this was also found in earlier studies that “education raises off-farm productivity and induces rural Pakistani households to shift labour resources from farm to off-farm activities. This effect is strong, robust, and demonstrated via both the direct and indirect methods” (Fafchamps & Quisumbing 1999). Maitra (2000) found similar traits in South Africa and this validates this study in that a lack of quality education (through poor school materials and poor attendance by school going children) increases poverty. School dropout was found to be a significant driver of poverty in Zimbabwe (Dakwa *et al.* 2014) and some of the reasons for school dropout in Zimbabwe include lack of financial support for school needs, HIV and AIDS, attitude towards school, cultural and religious beliefs and peer influence (Dakwa *et al.* 2014:1). Rumberrger (1987:100-122) concluded that the factors that causeschool dropout are many and complex. this is in tandem with Ballantine (1993) who termed school children dropping out of school as “at risk” of poverty.

Distance to the nearest health facility by households was found to be a significant driver of urban poverty in Harare. One kilometre increase in distance to the nearest health facility increases the probability of household poverty by 2.186 units. Similar conclusions were reached in Schoeps *et al.* (2011) who states that distance to a nearest clinic or health care facility was meaningfully correlated to infant and child mortality. In explicit terms, Schoeps *et al.* (2011: 4) says, “study demonstrates that travel distance to the closest health facility is a major risk factor for infant, child, and overall under-5 mortality in the Nouna HDSS in Burkina Faso. The mortality risk clearly increases with increasing distance.”

Living standards indicators such as household sizes were also found to be statistically significant drivers of poverty in Harare province. A unit increase in household size increases probability of poverty by 5.646. Large households are more prone to poverty than smaller ones. Households that do not use electricity or gas as primary sources of energy for cooking were prone to poverty by 3.520 units per unit of not using these primary sources of energy.

Economic security dimension was found to have three indicator drivers of poverty: employment of household head, unemployment of household members besides the household head and asset ownership. Households with unemployed household head and or unemployed other adult

household members were found to have significant probability of falling into poverty. These findings have been found elsewhere: “results reveal that a range of household head, partner and demographic characteristics in addition to life-changing events have an impact on both the likelihood of remaining poor and slipping into poverty” (Buddelmeyer & Verick, 2007:1). Unemployment of other household members (5.64) has a higher significance than employment of household head (2.592). A unit increase asset ownership increases probability of non-poor by 4.371 units.

Land ownership is a statistically significant driver of poverty in Harare. A unit increase in land ownership increase the odds ratios of non-poor of the household by 283.046. Poor public roads were found to be a significant driver of poverty in Harare. Households who face poor roads in their community had higher chance of being poor. A unit decrease in quality of roads logistic infrastructure, increases poverty by 4.459 units. Pollution drives poverty in Harare. Households in communities exposed to higher levels of any form of pollution were found to have a higher probability of poverty than those with less pollution. Food shortage and food borrowing were also found to be drivers of poverty. Households with insufficient food and households who borrow food were food more likely to be driven into poverty.

6.10 RECOMMENDATIONS ON POLICIES THAT COULD BE USED TO REDUCE URBAN POVERTY IN ZIMBABWE.

There is 37% multidimensional poverty in Harare province which can be broken down as follows: Harare rural 50%, high density locations 42%, medium density 25% and low density 15%. The level of poverty in Harare is extremely high and requires interventions in order to achieve UN SDG 2030 targets of reducing poverty in all its dimensions and forms and leaving no human in poverty (UN, 2019). The first port of call is to reduce poverty in rural locations in Harare which have head count poverty of 100% and policy interventions can then be spread to all locations. The ideal policy interventions are informed by the statistically significant findings of indicators from each dimension. World Bank (2018:7) noted that “strengthening the linkages between growth and poverty reduction requires a mix of policies...”

Dimensions with significant poverty which require policy interventions are economic security (22.9%) followed by public infrastructure (18.7%), education (13.1%), health (14.2%) and food insecurity (9.2%). The policy recommendations on each are discussed in following paragraphs.

6.10.1 Education dimension policy interventions

Firstly, policy makers ought to allocate more resources into supporting education development and growth in the country. The dimension makes 13.1% contribution to the poverty in Harare province across all location. It has been established that the key causes of education poverty are school children dropout and lack of school materials by children. The level of school children dropping out of school should be corrected through a concerted effort that improves the learning environment. Dakwa *et al.* (2014) discusses a range of possible causes of school dropout which the government and development partners should re-assess in order to determine the causes. School dropout has a serious effect on poverty in Harare in particular and this could also apply to the Zimbabwean country in general. The study found a significant causal relationship between school fees affordability and school children drop out. This implies increase in school materials needs increase school dropout and the opposite is also true. This entails that a twin approach is required in form of government and development partners support across all school going ages of vulnerable subgroups to improve school attendance and hence attainment of employable or tertiary educational levels. All locations recorded education poverty (rural 57.4%, high density 32.2%, medium density 25.5% and low density 26.2%) hence government policy framework targeting all schools that support education in form of school materials such as stationery and bursaries for vulnerable and families that cannot afford. Food is one of the resources school children lack as shown by dimension food insecurity, there is need to develop school food programme such as WHO's Focusing Resources on Effective School Health (FRESH) (WHO, 2020:17-23) and this can be achieved if government works with development partners in the education sector. Other policy interventions this study recommends are:

- a. Resourcing schools and tertiary institutions with resources and material;
- b. Early childhood developmental education framework that excites and 'catch them young' towards education from the onset as a way of reducing individual traits for dropping out of school;
- c. Development of free secondary education attainment for all to stop dropouts;
- d. Promote lifestyle skills learning across all age groups of children to improve education acceptance which will reduce dropouts;
- e. Adult education to increase parents and guardians influence on education.

- f. Capacitate schools monitoring policy and programs twinned by education officers, social workers and other relevant government departments across the country to understand performance and needs of school children.

6.10.2 Health dimension policy interventions

In total 36.8% people face health poverty in Harare province and it health poverty is 14.2% share of poverty multidimensional poverty in Harare. Distance to the nearest health facility was found to be the significant indicator of health poverty and it is so significant such that an increase in distance to the nearest health centre increases health poverty by 2.186 units.

The distance households travel to access health care should be reduced by construction of more health centres so that people do not have to walk long distances to access health care as poverty is strongly related to distance to health care points. Ordinarily primary health care provision is in the form of paediatricians, general practitioners and general internists (Weiner & Starfield, 1983) to achieve doctor to patient ration of 1;1000 (WHO, 2018) is of paramount importance in good health maintenance and enhancement.

Bird *et al.* (2010) recommended that governments should reduce remoteness in order to improve health care hence, this will decrease health poverty, this study found that rural dwellers in Harare are poorer than urban dwellers hence it is recommended to expand health infrastructure across the country and more so towards rural communities because reducing distance and time spend travelling to reach health care facilities reduce health poverty and this will enhance human lives. Long distance to access health care leads to “social exclusion and discrimination” Bird *et al.* (2002). The government and other policy makers such as development partners who are many within the health fraternity in Zimbabwe can however improve efficiency and effectiveness of road and other modes of infrastructure so that people reach medical facilities easily.

It has also been noted that there is strong relationship between incidence of poverty and distance travelled to access medical care, Bird and Shepherd (2003) hence this study highly recommends that the distance between health centres should be below 5 km so that everyone can access meaningful health care given distance “itself increases the costs of accessing health care and other services, and the poor lose a higher proportion of income making the journey.” (Bird *et al.* (2010). There is need for massive budgetary allocation by the government towards health care system in the form of construction of health care facilities. Health care provision can be streamlined so that clinics and hospital are located in a way that clinics which are cheaper to

construct and operate are spread in each ward to reduce travelling distances to below 5 km across the country and referral hospital are located to serve a given number of wards clustered together to achieve the recommended WHO doctor to patient ratio of 1:1000 (WHO, 2018).

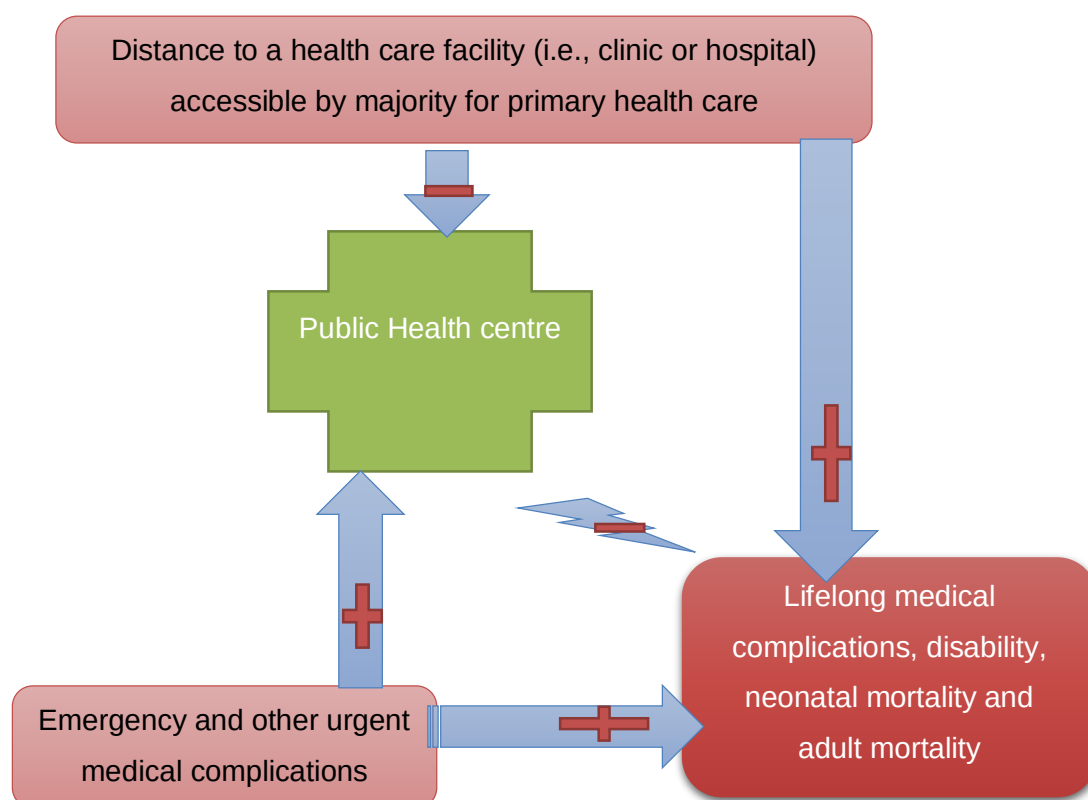


Figure 6-42: Impact of distance to the nearest health care facility on health

Source: Reseracher's own illustration

Quattrochi *et al.* (2020) in early studies also found that distance over 5 km by a housolds to access health care was related to higher child mortality in Kenya. The study like this study, recommended efficient transport facilities and construction of additional health facilities.

6.10.3 Policy interventions: Primary source of cooking fuel indicator

Standards of living dimension indicator, source of cooking energy is found to be a strong determinant of probability of poverty. Households with poor and backward sources of cooking energy have higher odds of poverty. Lack of enough energy and use of poor energy source has already been identified by SDG 4-8 (UN, 2018) The study noted that cleaner energy is mostly available to locations and households with higher income in Harare and the poor uses sources of energy that are not recommended by SGD4 this confirms to preceding studies that Zimbabwe has unequal and high energy deprivation (Chipangano, 2018:1). Hence, electrification and enhancement of clean energy such as solar energy and gas usage across the country is highly recommended so that energy poverty is totally eliminated. It is this study's findings that lack of reliable energy sources (mainly electricity and gas) lead to household poverty in Harare and it this study's expectation that energy poverty increases as we spread to other provinces from the

main grid and Zimbabwe Power Company (ZPC) and Zimbabwe Electricity Supply Authority (ZESA) headquarters in Harare and this mostly affect remote areas and further towns from Harare. Rural electrification program being spearheaded by Rural Electrification Agency (REA) should be enhanced across the country with mighty intensity as such program is capable to improve quality of life and energy sufficiency and this reduces energy poverty across the whole country (Pereira *et al.* 2010:1). Zimbabwe installed energy capacity to produce 2037.25 MW made up of 10 independent producers nonetheless, ZPC produces more than 90% of Zimbabwe energy. The energy deficit for the country stands at 60% hence, the deficit results in people looking for alternative sources from the environment near them.

Zimbabwe has vast deposits of coal, Hydro renewable energy at Kariba, regional power energy import channels (ESKOM) and private power plants which all have capacity to supply energy across the country but remain underutilised through inefficiency given continuous power cuts and unavailability of power lines in many parts of rural Zimbabwe, where majority of the energy poor live (Global Network on Energy for Sustainable Development (GNESD), 2011). Zimbabwe government should subsidize energy connections to the power grid which have been found to be one of the most important factors to lack of energy (Njiru & Letema, 2018). Furthermore, it has been established that increased electrification and use of modern energy sources results in direct and indirect massive job creation in the country and this will help the employment status of household heads and household members which were found to be significantly unemployed by this study. Liquid Petroleum gas and other clean energy sources such as solar energy and wind energy have potential to reduce poverty by enhancing human livelihood. However, the current cost USD\$ per KG pegged by (ZERA, 2020) is beyond the reach of many households. There is need to enhance production of methane gas on top of subsidized LP gas import which does not require foreign currency and is readily available locally. It should nonetheless be expounded further that Government should subsidise expansion programs on clean energy as outlay costs of such programs are comparatively expensive however, their benefits are long term. The use of clean energy is advisable to the government as it is energy efficient and this reduces carbon emissions and resultantly will reduce global warming. Clean energy because it is energy efficient will reduce costs of supplying energy into the future. Of note is the need for the government to come up with a renewable energy national plan that sets tangible goals that ought to be achieved over a specified period. Renewable energy 5- year strategic plan is a common practice with various countries, for example in 2009 the USA sets \$150 billion towards renewable energy national capacitation, additional 24,4 billion towards renewable energy efficiency programs and 23 billion Federal funding towards renewable energy researches all leading to creation of 2,5 million jobs (Pollin *et al.* 2009:2). Zimbabwe and Harare Authorities

should develop renewable energy programs that reduces depends on outdated energy forms and this will reduce energy poverty and in the process aid job market across the country. The renewable energy plan that can be adopted by Harare and Zimbabwe should consist of an enabling Act on clean energy, assistance to local communities on clean energy usage and mandated cap on carbon emissions.

6.10.4 Economic security dimension policy interventions

The dimensions are found to show deprivation to as much as 98.1% in Harare rural, 87.7 in high density, 76.4% medium density and 82% in low density. The overall deprivation for the dimension is 86.8% across all locations. The dimension has the highest contribution to overall poverty with 22.9%. Economic security dimension is so elastic to the extent that it has Wald coefficient of 42.169. This means that policy interventions are likely to influence the dimension. The following indicators were found to have significant impact on employment poverty:

6.10.5 Employment Indicator policy interventions

Create employment as lack of employment has been identified as a factor in this study that should be addressed by government in Harare hence, Zimbabwe. The economy does not have enough opportunities; however, there is a positive relationship between economic growth and employment (Dopke, 2001; Kapos, 2005; Schmid, 2008; Herman, 2011). The basic policies that can increase employment are; create employment, promote employability of citizens and enhance efficiency of labour markets through prudent macroeconomic management

Increase in employment can be achieved if the government undertakes various developmental long-term projects in the country such as construction of dams, mining and infrastructural development as espoused in the Transitional Stabilization Programme (TSP) development agenda of the government.

Promote employability of citizens this entails capacitation of the country human capital and can be achieved if emphasis is put on poor and vulnerable members of the society. The level of skilled labour in Zimbabwe of 13% (UN, 2020) calls for the policy makers to empower the citizens with employment skills first. The most vulnerable are the women, the handicapped and the economically disadvantaged. Employment should be spread across all spheres of the country and the poor should be encouraged to apply posts which they qualify. On the job training programs should also be embarked upon by policy makers. Promotion of employability should also target labour export in case labour market in the country remains depressed. This

can be achieved if the government enters into agreements with other countries seeking skilled labour.

Enhancement of efficiency of labour markets is another policy intervention that is being recommended as way to create employment. Labour markets do not work in isolation, they are driven by macroeconomic fundamentals. It is strongly advocated that credible, policy consistency (not reversals) and transparent policies be created and fine-tuned that will drive the economy to middle class from the current low income.

Employment will enhance asset ownership by private citizens which was found to be a significant determinant of poverty. Government can enhance asset creation using a slew of participatory and social policies including reducing borrowing rates from current 35% p.a. (RBZ, 2020) to affordable rates such as under 5% p.a. being used in South Africa (SARB, 2020). Other policies include market related social security and social safety nets to vulnerable citizens, promoting local business through international linkages and easy of doing business policies (World Bank, 2018:5).

6.10.6 Asset ownership Indicator policy interventions

This study strongly recommends that land ownership be improved across all households to enhance households' quality of lives. Asset ownership by households is directly related to economic participation and income. Hence, there is need to broaden economic opportunities in the province and in Zimbabwe as a whole so that poverty can be reduced through asset ownership. Assets reduces risks of poverty as some assets are tradable on the market in cases of unanticipated poverty circumstances befalling households. Assets accumulation is positively related to savings and is based on the following 7 institution constructs which the government of Zimbabwe must provide:

1. Enabling access to assets to households. This can be done through employment creation and other economic emancipation opportunities.
2. Information dissemination. Government should provide citizens of the country and mostly resident of Harare with information relating to resources and employment opportunities. This can be done through dedicated broadcasts to graduates and arranged seminars.
3. Incentives provisions. This can occur through giving private employers incentives in form of tax cuts for certain number of new employments it created in the year.

4. Facilitation of asset ownership. This can occur through retraining people to make them employable and promotable and also facilitating savings and making savings automatic to the residents.
5. Expectation. This happens when the opportunities for asset creation are enhanced. Raising expectation increases market confidence which in turn will create employment opportunities.
6. Setting restrictions. Involves setting rules that does not permit ownership of certain assets or use of certain resources.

Security of assets. This is pertinent. It includes enforcing rule of law on private asset ownership and asset convertability which increases freedoms of assets holding. It also includes private assets protection legislations.

Individual constructs include learning and education, good health maintenance and hardwork. It should be stated that institutional constructs have the widest benefits as far as asset ownership is concerned. Asset ownership determination is presented in diagram below:

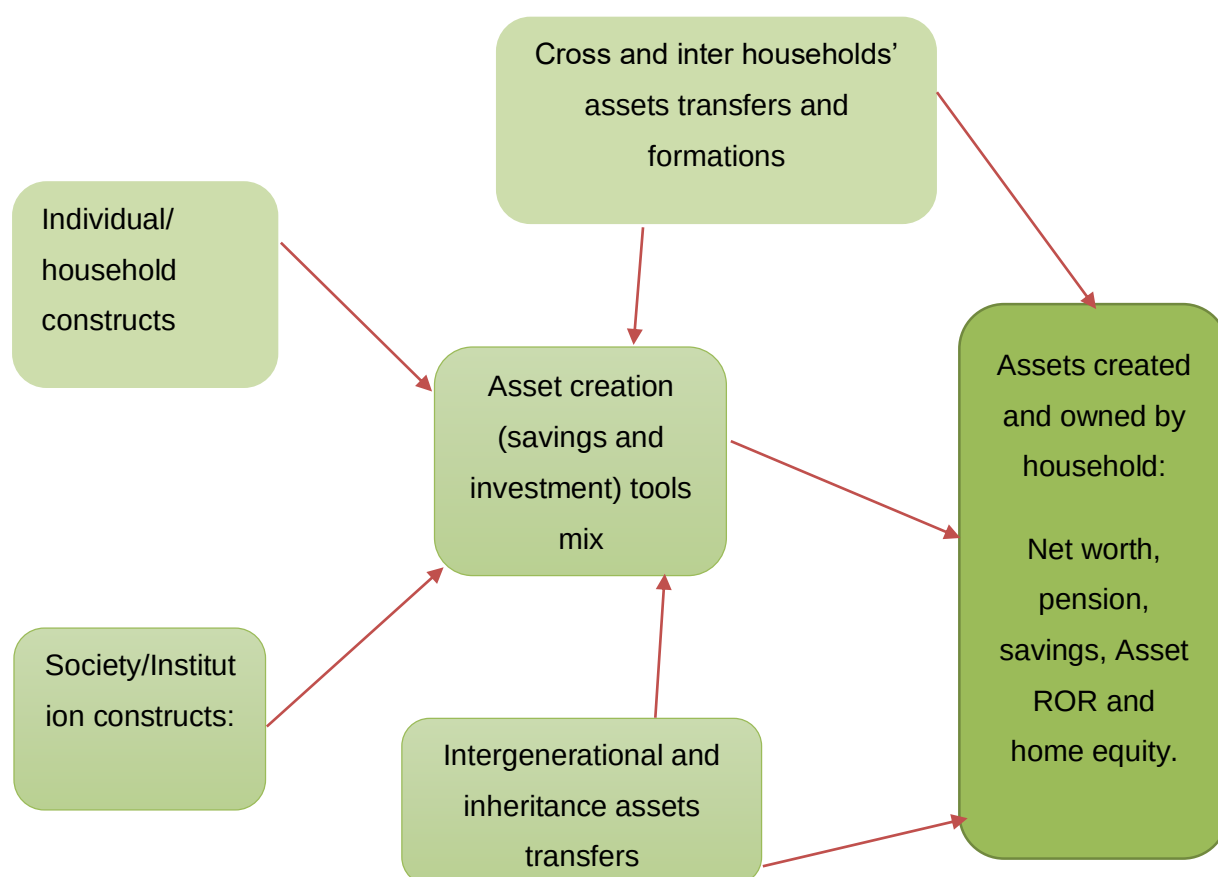


Figure 6-12: Asset ownership determination for households

Researcher's own presentation

6.10.7 Land ownership Indicator policy interventions

The indicator implies a unit increase in land ownership will increase the probability of non-poverty by 5.2. There is need to enhance land ownership through resizing of existing land given to only 15 000 to make sure every benefit. Furthermore. It remains the government's function to extend access to forms of capital to improve lives. Zimbabwe undertook the fast-track land reform programme for the period 2000-2003 and 150,000 households benefited only hence it did not address land ownership problem (Moyo, 2011). There is need to address challenges that arose from land reform as noted by Moyo and Yeros that:

The immediate result of the land reform is clear and urgent, marked by worsening poverty and the inability to supply food to the local population. ... imperialism continues to exercise its financial power deliberately to isolate Zimbabwe and smother the process of agrarian reform ... agricultural production has been severely impeded from recovery ... the urban and rural population has been relegated to a state of humanitarian aid. ... the state has not yet devised a coherent plan for reconstruction and development, given that it cannot cajole private capitals into a national plan of introverted accumulation. ... the danger is the full reversal into a process of recompradorization and recolonization under a dictatorship of the bourgeoisie, and ultimately the failure to fulfil the developmental potential of the new agrarian structure. (Moyo & Yeros 2012, 242)

6.10.8 Roads infrastructure Indicator policy interventions to end poverty

There is need to improve roads infrastructure to improve movement of people and goods. Good transport infrastructure is a corridor to economic growth but transport effect on poverty has remained less discussed in the context of poverty eradication although it is vital given the fact there are various linkages between poverty and transport system as “well-planned transport provision may open up access to the city, just as poor transport planning and/or a lack of provision may reduce it. ...Transport may also affect quality of life in other ways. Travelling (or living close to major routes) may affect health and well-being, with indirect influences on livelihoods and related activities” (Urban Resource Centre, 2001). Transport also requires regulation of fares and continuous upgrade and maintenance of the transport infrastructure to make sure standard human life is maintained all the times.

6.10.9 Pollution Indicator policy interventions to end poverty

Pollution has been found to be a major detriment to human life, it causes poverty. This study finding that pollution is statistically contributor to poverty are in line with assertions by World bank that all forms of pollutions caused 16 million (16%) deaths in 2016 across the globe (World Bank, 2018). Pollution in this context means any form of negative externality which degrades human lives. Pollution can be reduced through some of the strategies suggested below:

Proactive environmental management policy as advised by Hilson (2003) and defensive environmental management propounded by Robb and Robinson (1995) such as dilute and disperse of waste, end of pipe method waste treatment. The first step would be an enactment of pollution prevention law and by-laws which deal with pollution prevention, recycle, treatment and disposal of waste as advocated by Phipps (1995).

Other policies that can be used include emission tax such as carbon taxation on vehicles. There is need to extend the emission tax to industries to reduce proportion of pollution in the form of water and air pollution. Whilst the policy looks easy to administer it is recommended that a viable balance is reached between the rate of tax and production, where possible substitution and efficient methods of production are recommended across the production chain.

Pollution controls in the form of assimilative capacity and 'principal of control' such that a certain amount of pollution is maintained all the time. Government can issue pollution permits which are transferable across agencies of pollution. There is need for the government to invest in pollution technology which regulates the level of pollution emitted at given time by a given polluting infrastructure (agent) to effectively manage and control level of pollution such as the Global Atmospheric Watch (GAW) propounded by Miller and Soudine (1994).

6.10.10 Food insecurity Indicator policy interventions to end poverty

Food insecurity in the form of food inadequacy which results in people skipping meals or borrowing food has been found to be a significant determinant of poverty. The indicators although they look like the outputs of poverty, they were actually found to determine poverty in this study and in previous study (Dasgupta 1997; Broca, 2002). "There is mounting evidence that fighting hunger also helps reduce poverty since hunger and under nourishment reduce labour productivity, increase susceptibility to illness, worsen school performance in children, reduce the willingness to undertake risky but more profitable investments and transmit themselves from one generation to the next" (Broca, 2002:4). It is there recommended that

government provide with safety nets to the vulnerable subgroups of the population in form of regular social welfare, grants and diet supplements.

It is recommended that the most vulnerable groups of the population receive food support from development partners and government on a continuous basis to enhance their nutritional health and hence positively improve their productivity. The following dimensions have been recommended by Broca as ways of enhancing food security:

- a. Food availability; this include enhancing domestic food production through monitored and effective production and through food imports by both government and private players;
- b. Food access; the dimension entails that the government through proper fiscal management makes households acquire their own food needs. This is made possible by arrangements that enhance food entitlements across the country.
- c. Food utilization; this aspect makes households achieve food adequacy through non-food dimensions;
- d. Stability of access: the dimension entails government and development partners targeting the at risk of food inadequacy groups such as the landless or unemployed or school children receive government support at point of food insecurity risk (Broca, 2002:6).

As discussed earlier in this section, food inadequacy will affect health of people and hence a chain of poverty outcomes develops across other poverty dimensions and this negatively affects human life enjoyment.

6.10.11 Policy recommendations based on durational poverty

The study found that poverty is increasing in Harare. It is strongly recommended that addressing of the dimensions of poverty will reduce poverty. Head count poverty, poverty severity and poverty gap are all increasing. Government policies that reduce poverty are directly going to reduce durational poverty as they will impact on the asset index used to develop durational poverty for Harare province. Assets such as bank savings, income and land ownership are directly related to employment and general economic growth of the economy. It is recommended that policies that enhance employment creation should be advanced in order to improve incomes of the households and hence this will create means for asset ownership to households. Lack of assets such as stove, refrigerator, cell phone, laptop, radio/tv and others means the households are lagging behind as these assets are life needs than wants. They are

all related to the level of household income which can be improved by economic growth policies.

6.10.12 Policy recommendations based on poverty perceptions

Poverty perceptions should be incorporated into poverty reduction strategies. Poverty has been perceived to be caused by individualistic, structural and fatalistic perceptions, hence there is need to address the structural aspects of the economy as well as improve individual aspects through education for them to be employable and improve fatalistic perceptions through education. The poverty perceptions that require interventions are; poverty is inevitable and it is part of life, society lacks social justice, the poor live in societies with no opportunities, the poor have had bad luck and the poor households encountered misfortunes. There is need firstly to reduce poverty through policies discussed in sections 6.10.1- 6.10.7. Perceptions of poverty arise mainly because people see and feel poverty hence, elimination of poverty will change how people perceive. The authorities both in Harare province and at national level should formulate a concerted course of action that is required to reduce poverty. It is this study's point of view that some of the policies advised in section 6.10.1-6.10.7 are useful. Once poverty reduction plan is formulated, the government should proceed to administer the policies to avert poverty as diagnosed. Finally, there is need for self assessment to determine the impact of the policies in reducing poverty before perceptions are re-evaluated from the communities that were deemed to be in poverty by the study as advised by Danziger *et al.* (1984). The next section will provide with policy recommendation based on significant perceptions of the study.

6.10.12.1 Perceptions based on poor living in communities with no opportunities

The perceptions that poor households live in communities with no opportunities requires the government and parliament to set up an Independent Public Advocacy, which should have powers to audit resources within each province districts. The formulation of devolution by Zimbabwe is such a good drive but an Independent Public Advocacy will enable resource transfer if it is found that resource distribution and accessibility is skewed towards certain districts and or provinces. This calls for gender, race and age to be considered into national devolution agenda of the government.

The Zimbabwe Constitution Amendment number 20 of 2013, section 264 provides a clear framework for national devolution of government roles and powers through setting of Provincial Councils Act (29:11), Urban Councils Act (29:15), Rural District Councils Act (29:13). The full benefits of decentralisation is to improve access to resource and government development

programs. Devolution will reduce poverty in communities which are being ignored or lagging behind by improving access to resources. Provincial and local councils are better placed to communities that require poverty elliviation but in general Zimbabwe Devolution agenda remains in bud hence, more should be done to achieve the desired objectives of Zimbabwe Devolution Agenda provided by Section 5 and Section 264 of Zimbabwean Constitution. Countries that have effectively applied decentralisation of government are; UK, Germany, South Africa and Kenya. Some of the befenits of decentralisation are shown in below.

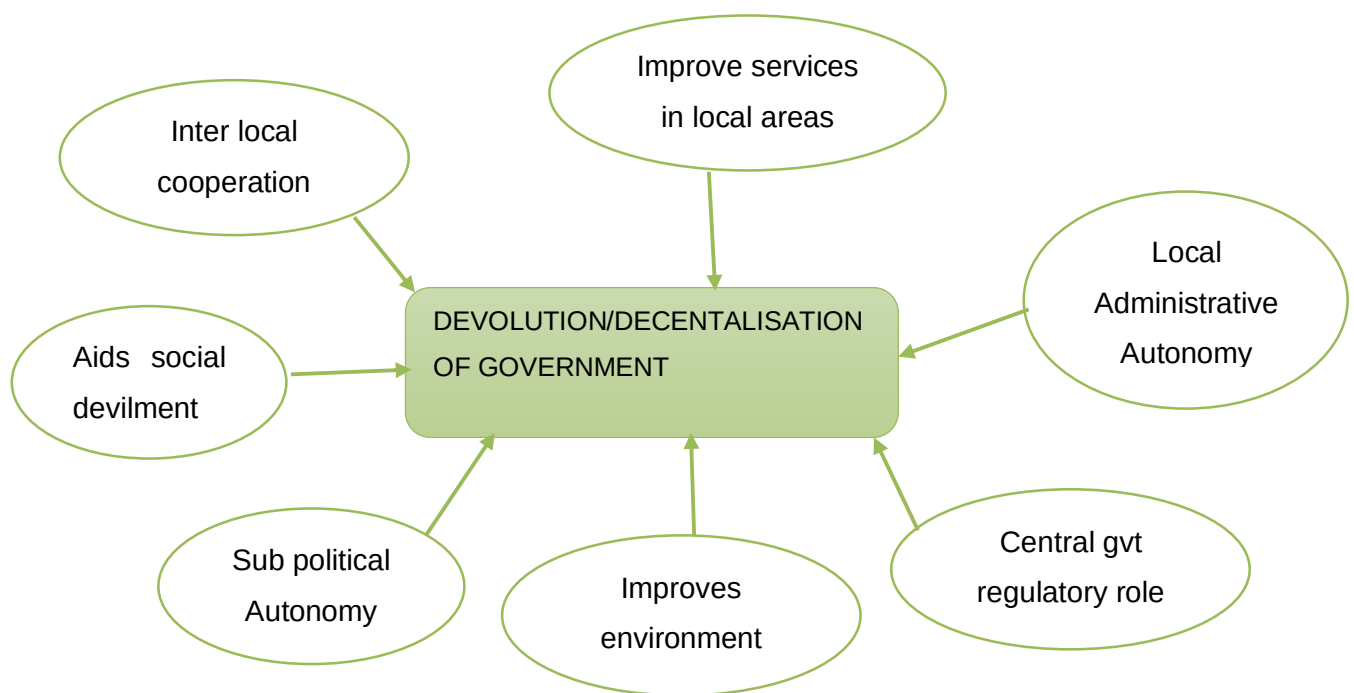


Figure 6-13: Devolution of Government and poverty

Researcher's own presentation

However, the devolution remains in dormancy as actual provincial budgets and devolution personnel are yet to be put given financial votes and put in the provincial structures respectively. Furthermore, section 5 of the Zimbabwe Constitution identifies the Zimbabwe Government tiers to be national government, provincial government, urban councils and local authorities. The develotion idea is a noble improvement if administered but 8 years after its enactment, it remains a wish to see provincial government structures have their own budgetary framework.

6.10.12.2 Perceptions based society lacking social justice

There is need to improve social justice system and civil liberties in the country. This entails ceation of all equal before the laws and capacitating and enabling citizens to participate in aspects of the economy according to their capabilities than corruptly influencing the selection process of who does what. There is need to support households, young adults and any other disadvantaged citizens of the national economy for them to participate fully to the eaconmic activities of the economy. Support can be through education and empowerment programs. The disabled require support systems that understand their needs and proffer solutions for them to engage and perform fully in the realms of the economy. Perceptions on lack of social justice speak of inequality and divisional social stratifications in the society (Liu, 2018:1). Hence, there in need to empower people in lower economic status to reduce the gap between the high net worthy and those at the bottom of economic order. Groenewald (2020:1) noted that empowerment that can be used to deal with lack of social justice include improving university uptake by students from poor households, develop programs that talk about social justice and create discussion forums on community social justice systems. It has also been founded that selection process has a strong bearing on cognitive constructs, feeling and attitudes towards perception of poverty in relation to social justice (Srouji, 2020:1-2) and this is also supported by Organisational Social Justice Theorem which is explained later. Hence, there is need to make selection criterion for employment, education and any other services beyond reproach in order to buit strong towers of trust, which will deriectly reduce poverty perceptions related to corruption or social justice system. The pillars of Organisational Social Justice Theorem are shown below

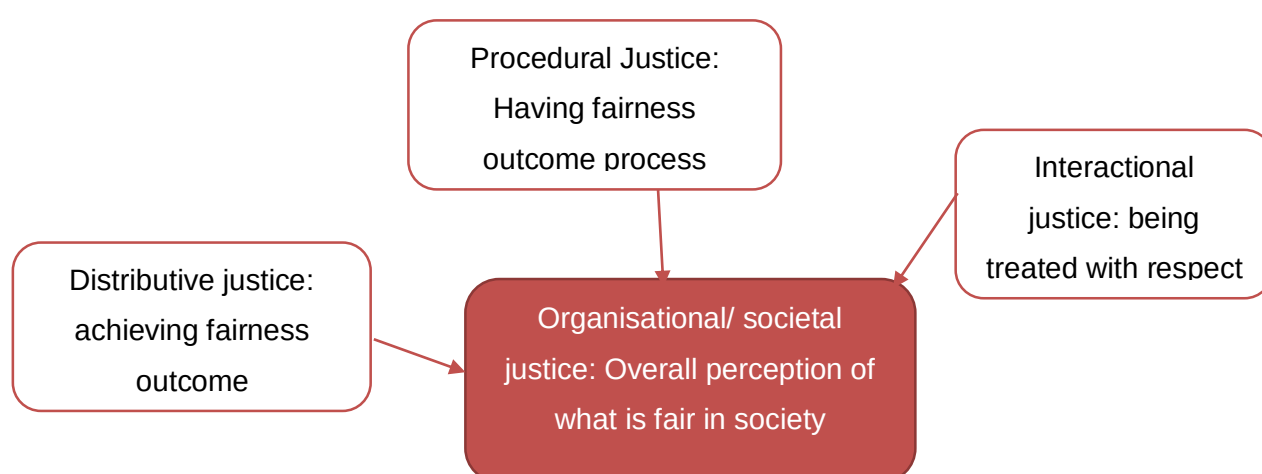


Figure 6-14: The pillars of Organisational Social Justice Theorem

Reseracher's own presentation

For the society to deal with lack of justice perceptions, distributive, procedural and interactional justice must be advocated such that the policy makers act on rectifying these perceptions.

6.10.12.3 Perceptions based on misfortunes and bad luck

The study found that households perceive poverty as a consequence of bad luck and households blaming misfortune for their poverty. These poverty constructs require opportunities for everyone to participate. Governance and insurance are important in reducing the effects of bad luck. Insuring assets and employment through pension schemes could reduce poverty related to risk on assets and death of the bread winner.

6.10.12.4 Perceptions that poverty is inevitable and part of life

There is need to induce sense of hard work and perseverance to demystify the belief that poverty is a part of life. Training and creating educational programmes for citizens to undertake employable courses that directly influence their earning capability could essentially demystify the tacit belief that poverty is part of life. Community programmes and national devolution agenda that are spearheaded by the government are equally integral attributes in fighting poverty.

6.11 CONCLUSION

The chapter responded to the objectives which the study set to accomplish. The first task for the study was to develop a new multidimensional poverty measure for Harare province by adopting UNDP MPI methodology. To achieve this objective, the study crafted 7 dimensions and 36 indicators which were either used in prior studies, or which have a strong ongoing interest among academics and research discourse. They all form part of deprivations targeted for reduction by UN SDG by year 2030. The main source for data used to develop a new MPI were various researches regarding formulation of MPI and empirical evidence from other countries. To this end, the study used similar weights and cut offs as applied by UN for its MPI.

The study developed a multidimensional poverty measure MPI_{oH} which was established at 37%. Poverty is rife in Zimbabwe and the durational poverty measure used in this study indicates that poverty is increasing every year since 2010 to current year 2020.

The second objective was to compare poverty among the locations in Harare using the developed multi-dimensional measure. The first task was to perform statistical tests on the model logistic model and food was a good fit for the study objectives. Wards were divided into

respective locations (Harare rural, high density, medium density and low density). To make comparison statistically feasible, the sample sizes from each location was above 30 questionnaires. As expected, rural people were found to be statistically and significantly facing the highest poverty when compared to other locations. It was also established that high density, medium density and low density in that order exhibited poverty (highest to lowest). The study determined the contribution of each dimension and it was fascinating to note that the highest contributor to multidimensional poverty in Harare province is economic security with 22.9% of multidimensional poverty share. Education was found to have 13.1% contribution to the developed MPI in Harare province. Standard of living had the smallest contribution to the MPI with 6.4% contribution.

The study further determined the perception of urban poverty in Harare province. The objective was achieved by classifying perceptions into 3 main categories of poverty: individualistic, fatalistic and structural. Poverty perceptions were explained by poverty being inevitable and part of life, the poor are poor because they lack social justice in the society, they live in societies with no opportunities for the poor, they encountered bad luck and finally they suffered misfortunes.

The fourth objective for the study was to determine the durational urban poverty for Harare province. Adjusted FGT model by Foster (2009) was used. Asset index was used to measure durational poverty. The asset index which included income was more appealing because it gave a wider range of variables. The study found that poverty is increasing in Harare from 2010 to 2020 and mostly so in rural wards and high-density areas. Low density and medium density faced less poverty increases over time.

Investigation of the drivers of circumstantial urban poverty in Harare was the next objective that was achieved by this study. The drivers were drawn from significant indicator variables of the regression model. The drivers of poverty variables enabled the study to derive policy recommendations that could be used to reduce poverty. Overall, the study achieved the set study objectives and proffered a new multidimensional poverty measure for Harare province.

CHAPTER 7: SUMMARY AND CONCLUSION

7.1 INTRODUCTION

This chapter concludes the study on an investigation of circumstantial and durational urban poverty by developing a new multidimensional measure in the case of Harare province. The chapter draws conclusions from the preceding chapters that analysed and interpreted results of the study. First, the chapter presents conclusions on each objective that was pursued. Secondly this chapter proffers recommendation for policies and strategies that were identified in the study. Thirdly the study discusses its limitations and areas for further research on multidimensional poverty that required further exploration.

7.2 REVIEW OF THE STUDY

The purpose of the study was to investigate circumstantial and durational urban poverty by adapting and developing a new multidimensional measure in the case of Harare province. The study was broken down into seven chapters. Chapter 1 is the introduction and background of the study which discussed problem statement of the study, research theoretical and empirical objectives, scope, research design and methodology, ethical considerations and significance of the study. In the second chapter, literature was extensively reviewed, specifically the theoretical frameworks on causes of poverty, measurement of poverty, poverty trends, durational and circumstantial poverty. Chapter 3 concentrated on review of literature for the development a framework used to meet all the objectives of the study. Chapter 4 provided detailed Zimbabwe country profile in the macroeconomic and poverty perspectives. Chapter 5 described and defended the methodology adopted in this study. Chapter 6 analysed, interpreted and discussed the study findings. It also proffered policy recommendations. The current chapter provides and conclusions suggestions for future studies, specifying in the process the very limitations of the study.

7.3 CONCLUSIONS ON THEORETICAL OBJECTIVES OF THE STUDY

The study set the following theoretical objectives that will be individually discussed:

1. To critically review the theories of poverty and their applicability in the context of Zimbabwe;
2. To review and critique the existing measures of poverty and their applicability in the context of Zimbabwe;

3. To review theories on trends of poverty and how they contradict based on the different methodologies and measures;
4. To review and critique the existing durational poverty measures and their applicability in the context of Zimbabwe;
5. To review and critique literature on circumstantial poverty

7.3.1 Conclusions based on review of theories of poverty and their applicability in the context of Zimbabwe

The first theoretical objective required the study to concentrate on theories of poverty and discuss their applicability in Zimbabwe context. Poverty theories resonate with how certain schools of thought define it (Davies & Martinez, 2014:6). The study found that theories of poverty are divided into behavioural/ cultural, structural and political theories envisaged by various schools of thought. These include Classical, Neoclassical, Keynesian, Marxist, Social Exclusion and Circumstantial schools of thought. There is an appreciation of multidimensional definitions over time but is also important to note that despite poverty being a multidimensional phenomenon, the definition of poverty is unique from society to society depending on societal convictions of how poverty occurs in each society, (Hobsbaum, 1968:398). This is so because poverty is a household, societal or national value judgment (Sen (1979) over time and space. Theories, separately, did not provide a complete multidimensional framework on poverty. The study demonstrated that when various poverty theories are put together, a more presentative multidimensional poverty measure is produced. This objective enabled the study to generate a general framework on causes of poverty which is grounded in economic principles of poverty. This objective was critical in explaining the existence of poverty across households in same neighbourhood, the existence of different levels of poverty across locations and why poverty is generally different across space and time. To achieve this objective, poverty theories were scanned across various economic poverty literatures. Zimbabwe poverty analyses have largely relied upon the monetary approach - ICES of 1995, ICES 2001, PICES 2011-2012 and PICES 2017. Theories of poverty in their individual frameworks do not address the multidimensional scope of poverty hence policy advocacy generally becomes ineffective. There is need to combine these theories in order to fully appreciate the depth and context of poverty as clarified in this study.

7.3.2 Conclusions based on review and critique the existing measures of poverty and their applicability in the context of Zimbabwe

The study found that there are numerous poverty measurement theories that have been advanced since the 17th century. Multidimensional and unidimensional poverty measures were distinct in this area. The study established various reasons for undertaking serious studies in poverty measurement. It was established that the reasons for such an undertaking vary from country to country as different poverty rates across sub locations, nations and regions require different policy interventions from policy makers. It was established that vast literature on poverty measurement uses money metric poverty measures. Poverty measurement should procedurally use the following laid down stages when developing a poverty measure:

1. Identify the poor in a population;
2. Determine unit of poverty measurement most appropriate (group or individual);
3. Determine the most appropriate dimensions and indicators that widely represent poverty;
4. Design a multidimensional poverty measure.

Multidimensional poverty measurements have long been proposed in literature but they have been used less when compared to monetary methods. Multidimensional poverty has a strong appeal because it enables multiple considerations of the forms of deprivations faced by the poor. Certainly, it was argued that poverty is not only the absence of money or basic needs but a wider array of forms of deprivations ranging from absence of happiness, lack of empowerment, political and social deprivations that cumulatively affect the enjoyment of human life.

Various theories of poverty measurement have been provided in economic literatures. Despite various measurement methods being advanced, poverty remains a difficult concept to measure (Laderchi *et al.* 2003). This stems from the fact that multidimensional poverty takes on various dimensions, some of which are not easy to factor into a measure. Some of the reasons for poverty measurement include:

1. It enables poverty formulation and testing;

2. It aids policy interventions within the society, households or individuals by informing what needs to be done and in what priority;
3. It gives knowledge on the general direction of poverty from society to society over time
4. It enhances policy makers setting measurable targets on poverty eradication;
5. It facilitates poverty comparisons at national, regional and international level.
6. It permits investigation into the connections among different dimensions of poverty.

Generally, poverty measurement is key in answering three questions relating to poverty eradication: how, who and when.

Most development agencies such as the World Bank, UN and IMF and various governments have now focused on multidimensional poverty measurement methods. UNDP MPI is the most adopted multidimensional measure. This measure uses three dimensions and 12 indicators making it a robust measure, even though various countries and researchers have adapted the UNDP MPI and developed their own poverty measures.

7.3.3 Conclusions based on review of theories on trends of poverty and how they contradict based on the different methods and measures

The study reviewed theories on trends of poverty to understand how they contradict based on the different methods and measures. Poverty trend analysis enables policy makers to proffer effective policy interventions from time to time. Several poverty trends have been produced mostly in developed economies as policy makers and researchers profiled poverty over time. Poverty lines, Official Poverty Measure (OPM) and Supplementary Poverty Measure (SPM) are the most common measures of poverty trends.

7.3.4 Conclusions based on review and critique the existing durational poverty measures and their applicability in the context of Zimbabwe

Most notable durational poverty measures from theory are tabulation/ count method, Life Table method, bivariate hazard method, multivariate hazard method, components of variance method, Foster Poverty Adjusted Index (2009), and Kaplan–Meier method. Durational poverty is preferred to static poverty because the phenomenon and experience is dynamic over space and time. This vicarious nature can only be

captured when durational measures are applied. Most studies available cast a blind eye on durational poverty which is an unfortunate error as poverty circumstances always change with economic activity and catastrophes.

7.3.5 Conclusions based on review and critique literature on circumstantial poverty

Circumstantial poverty explains personal attributes and behaviours in individuals in relation to circumstances or situations that people find themselves in that cause poverty. Situational poverty theory includes both macro factors and individual behaviours to explain the circumstantial roots of individual behaviours. the circumstantial aspect of poverty is a philosophical approach that pins poverty on individuals, households and societies on individual preferences. It assumes people who have a limited perspective on life who in most cases chooses quick gratification are more susceptible to poverty than those who are patient and resilient. Circumstantial poverty alone, like other theories of poverty, does not provide a complete understanding of poverty because poverty is multidimensional.

7.4 CONCLUSIONS BASED ON EMPIRICAL OBJECTIVES

This section concludes the study by focusing on the empirical objectives of the study. Empirical literature review was scanned and it was found that the UNDP MPI is the most adopted and adapted poverty measure globally (Gallardo, 2020). However, other empirical poverty measurement indices and methods commonly used include fuzzy sets (Lemmi and Betti (2006); Chiappero & Martinetti (2000), Bourguignon and Chakravarty (2003) method, the Duclos *et al.* (2006) stochastic dominance approach and the OPHI & UNDP MPI (2010, 2018, & 2019). Muwonge and Batana (2014) advise that developing own MPI from UNDP MPI is doable and helps to fine-tune the poverty measure to meet the exact conditions and dimensions obtaining over space and time. The study by Muwonge and Batana used both monetary and non-monetary dimensions to design a poverty measure for Harare. Stoeffler (2013) developed own MPI for Zimbabwe using 8 dimensions and 14 indicators and concluded that poverty was decreasing in some households while increasing in others. The empirical objectives of the study, which are discussed below are:

1. Adapting the UNDP MPI and develop a multidimensional measure of circumstantial poverty;
2. Determining the durational urban poverty for Harare province;

3. Comparing poverty among the locations in Harare using the developed multi-dimensional measure;
4. Establishing the perception of urban poverty in Harare province;
5. Investigating the drivers of circumstantial urban poverty in Harare;
6. Recommending policies that could be used to reduce urban poverty in Zimbabwe.

7.4.1 Conclusion on adapting the UNDP MPI and developing a multidimensional measure of circumstantial poverty

The study adapted UNDP MPI to develop a new poverty measure with 7 dimensions across various forms of deprivations found in literature. The developed multidimensional poverty index for Harare MPI₀H is 0.37. This implies that 37% of people in Harare are in poverty. Table below shows the computed MPI for Harare province.

Table 7.1: Multidimensional Poverty Index for Harare (MPI₀H)

	Harare Rural	High density	Medium Density	Low density	MPI ₀ H
Headcount (H)	1.00	0.8774976	0.54138075	0.350854	0.7711258
Intensity of Poverty (A)	0.49627309	0.4787959	0.46596522	0.455286	0.4792233
MPI₀H	0.49627309	0.42014225	0.2522646	0.1597389	0.36954143

Source: Researcher's own computation from survey as shown in section 6.3.1

From Table 7.1, when poverty head count (H) is used to explain poverty, the phenomenon was found to be extremely high across all locations. Poverty intensity, on the other hand, produced statistics confirming decreasing poverty as we move from rural, high density, medium density and low density. Nonetheless, poverty headcount was found to be decreasing as cut-off is increased while poverty intensity is increasing.

The MPI developed in this study adds value to the ongoing poverty measurement discourse in the instance of Zimbabwe where a large poverty measurement existed. The developed model of this study could be used to measure poverty or could be adopted in part in other countries by other researchers who wish to measure poverty in a holistic fashion that caters for the multidimensional.

7.4.2 Conclusions on determination of durational urban poverty for Harare province

We developed a durational poverty measure using Foster (2009), using asset index which helped to answer the following topical questions for Harare province:

1. To what extent and how long is the urban poverty cycle?
2. Why do households fall into poverty?
3. What is the nature of urban poverty that households face?
4. How does increase in poverty affect the poor?
5. Do households face similar poverty (poverty inequality)?

The study found that poverty was actually increasing in Harare across all locations and more people were vulnerable to poverty. More people fall into poverty and the main reasons were poor income and other assets on the composite asset index. The study found people in different locations to have different experiences of poverty. Most poverty was recorded in rural Harare. High density citizens faced higher poverty than those residing in the low density. Poverty head count (P_0) increased for the entire period from 2010 to 2020. For periods before 2014, poverty rates were less than the MPI_0H but after 2015 poverty rates were higher. P_1 is increasing over the entire period but remains less than MPI_0H . Poverty severity, P_2 is also increasing over the entire period but remains less than both P_0 and P_1 .

7.4.3 Comparing poverty among the locations in Harare using the developed multi-dimensional measure

MPI_0H shows that poverty is different across locations in Harare. Indeed, Harare rural has the highest MPI of 50% followed by high density at 42%, medium density has 25% and low density have 15% poverty. Headcount poverty of the MPI concludes therefore that everyone in rural Harare was poor while poverty intensity was significantly similar across the locations.

7.4.4 Determining the perception of urban poverty in Harare province

The significant poverty perceptions for Harare are individualistic, structural and individualistic. The study found that poor people in Harare are likely to explain why they are poor in terms of:

1. Poverty is inevitable and it is a part of life;

2. The society lacks social justice;
3. They live in places with no opportunities for the poor;
4. They have bad luck;
5. They have encountered misfortunes.

7.4.5 Conclusions based from investigation of the drivers of circumstantial urban poverty in Harare

The study found 5 dimensions (from 7) as significant determinants of poverty in Harare province and these include Education, Health, Economic Security, Environment and Public Infrastructure and Food insecurity and Adaptation. Insignificant dimensions were dropped from the study model. The following were identified as main indicator drivers of poverty across the 5 significant dimensions in Harare:

1. Dropout from school by children aged 5-16 years;
2. Non-affordability of school materials/needs;
3. Long distance (km) to the nearest health facility;
4. Small household house infrastructure;
5. Poor primary source of cooking fuel;
6. Unemployment of household heads and other household members;
7. Non land ownership;
8. Poor road infrastructure;
9. Pollution exposure;
10. Insufficient food: Skipping meals and borrowing food or relying on help from friends.

The findings on education and health are also policy interventions that UN SDG targets in its SDG 2030 vision. It is common that unemployment is a leading cause of poverty. The findings on education show that for South Africa lack of quality education (through poor school materials and poor attendance by school going children) increase poverty (Maitra, 2000). Analysis of

durational poverty was based on Bane and Ellwood (1986:2) in which durational analysis focused on head count poverty (P_0), poverty rate (P_1) and severity of poverty (P_2). Vulnerability to poverty was also used to discuss households' chances of falling into poverty over time.

7.4.6 Recommendations on policies that could be used to reduce urban poverty in Zimbabwe

The study findings on other empirical objectives form part of the policy recommendations. The MPI_{0H} developed in this study indicates that there is 37% poverty in Harare. This is very high given the fact that poverty causes suffering, sickness, malnutrition, poor health and early death. More effort is required to 'reduce all forms of poverty and leave no one behind' (UN, 2019). The most problematic location is Harare rural which has MPI of 50% and head count poverty of 100%. Poverty dimensions which require policy interventions are:

1. Education
2. Health
3. Economic security
4. Environment and Public Infrastructure
5. Food insecurity.

The most urgent need is in addressing food insecurity indicators of skipping meals and borrowing which are statistically predominant in Harare as people try to adapt to poverty. Food insecurity leads to poor health which ultimately affects quality of human capital and production wages. The study recommends the construction of more health facilities to reduce the distance people travel to access health care. Pollution was identified as one of the poverty indicators under environment and public infrastructure. To address this, it is recommended that pollution control laws be enacted through the 'polluter must pay frameworks', using pollution embargoes or permits. Education dimension found that poverty is driven by school dropout and insufficient school materials. It is therefore recommended that government increases public expenditure for school children to catch them young and direct them towards productive futures.

7.5 CONCLUSIONS BASED ON THE PROFILE OF ZIMBABWE

The country faces very high unemployment rate (40.6%) when compared to UN desirable rate of unemployment of 2.3% (ILO, 2019). An analysis of government revenue shows that recurrent

expenditure gobbles 100 of its revenue (IMF, 2019) hence the prospects of capital projects are negatively affected by loans and interest on loans servicing. The country owes USD\$8.8 billion (40%) of its GDP to external creditors and USD\$7.7 to domestic creditors in form loans and interest, the total debt however inclusive of domestic borrowing and commitments is USD\$16.5 billion (IMF, 2019).

Zimbabwe is one of the poorest countries in the world with HDI value of 0.563 and ranking of 150 out of 189 (HDR, 2020). Although COVID-19 caused 8.7% contraction of Zimbabwe the regular problems of Zimbabwe are structural deficiencies, climate shocks (World Bank, 2020). Poverty is rife in Zimbabwe such that life expectancy for Zimbabwe is low at 61 years while child mortality is at 28.65% (Makate & Makate, 2017; Zimstat, 2017). Zimbabwe has only 13% of its population skilled force and 87% are unskilled (UNDP, 2020). Both communicable and non-communicable diseases affect large size of the population due to poor health care services and the top killers are malaria and HIV and AIDS (MoHCC, 2020). With 85% of the population is at risk of malaria, the country faces surmountable task to reduce the impact of health poverty.

Poverty is so rife in Zimbabwe to the extent that 59% of both rural and urban population currently requires emergency food assistance for period from 2019-2021 (ZimVAC, 2019). It is also reported that 60.6 households had per capita consumption below the poverty threshold in 2019 while Total Consumption Poverty Line (TCPL) for Zimbabwe was estimated at 70.5% in 2017 (Zimstat, 2017:38). On the other hand, the Gini coefficient for Zimbabwe increased from 22.5% to 29.3 for the period 2012 to 2017 and this is as a result of increase in individual poverty from 30.4% to 40.9% (Zimstat, 2017:19). There is serious poverty in Zimbabwe such that is estimated at child malnutrition 27.1% (UNDP, 2020). On top of high poverty in Zimbabwe, there is serious overall inequality (IHDI) 0.435 in the country. Income inequality stands at (43.2%), education inequality is (16.8%) and life expectancy inequality is (24.2%) (UNDP, 2020). Poverty has been found to vary with province however 70% of the population are in poverty whilst 29% face acute poverty (Zimstat, 2017:41).

7.6 CONCLUSIONS BASED ON METHODOLOGY OF THE STUDY

Data used was collected using a questionnaire that was administered across all the wards in all the locations (Harare rural, high density, medium density and low density) using Open Data Kit (ODK) in line with WHO COVID-19 guidelines and government of Zimbabwe lockdown Statutory Instrument 83 of 2020 (CAP. 15:17). Chapter 5 clearly explains the research design of the study. It also explains the sampling framework, pilot study, data collection procedures and validity and reliability tests performed for the study. The development of the new MPI for the

study is also provided in Chapter 5. The MPI development processes, selection of dimensions and indicators, cut-offs of dimensions and indicators, weights of indicators and dimensions. The selection of dimensions and indicators was mainly based on UNDP prior dimensions, SDG 2030 targets (Alkire & Santos, 2010; UNDP, 2018). The study provided a clear diagrammatic presentation of the stages undertaken by this study in developing its own multidimensional poverty measure. The study used logistic regression as done in prior studies by Maity (2018); Iqbal (2019); Fonta *et al.* (2020) for poverty analysis. Full analysis and various statistical tests of the model are provided in the study. The study significant dimensions and indicators are also provided in the study and relevant interpretations of the coefficients, odds ratios, omnibus tests and Wald coefficients are described in the study Chapter 5.

7.7 POLICY IMPLICATIONS OF THE STUDY RESULTS

Poverty measurement should be multidimensional and durational in its approach. There is need to address the drivers of poverty highlighted in section 7.6 to reduce poverty depth and extent. The study found that school drop out by children aged 5-16 years result in poverty and lack of school materials lead to poverty. There is a positive causal relationship between school dropping and lack of school materials. The conclusion is that most school children dropping from school mainly due to lack of school resources. This calls for government and development partners to mobilise resources to empower vulnerable children of the society. Distance travelled to reach health care was found to increase probability of poverty, as distance from health can exceed 5km, poverty increased. This implies that more clinics must be constructed within each ward and hospitals should be constructed to service at least a sizeable number of wards who require primary health care. The distance factor was also determined to be related to efficient transport system. Improving the road infrastructure (which was found to be causing poverty) would improve accessibility of hospitals and clinics. is the government needs to make sure that transport cost after improvement of roads remains affordable for the generality of the public.

Pollution was found to be another cause of poverty in Harare. Pollution control methods should be applied to reduce negative externalities of pollution. These include pollution control; pollution permits and pollution taxes such as carbon tax which is already implemented on vehicles. Skipping meals and borrowing food or relying on help from friends was also found to be a determinant of poverty. This could be solved if government provides food to vulnerable groups of the society such as the young, the old and unemployed. Lack of food leads to poor health hence it is strongly advocated that nutritional assistance on continuous basis be extended to the need of the society.

Land ownership is a significant determinant of poverty. It is therefore recommended that empowerment through land allocation to deserving citizens be implemented. These include resizing of farms to cater for those in poverty. This requires financial and technical support to the poor nations given the high capital outlay and high investment risks in farming as an enterprise.

7.8 LIMITATIONS OF THE STUDY

The use of locations (Harare, rural, high density, medium density and low density) rather than actual wards due to data collection constraints was not the initial intention. Lack of durational poverty measures for Zimbabwe made comparison of findings unachievable in this study.

7.9 AREAS OF FURTHER STUDY

Poverty measurement should be extended to all provinces in Zimbabwe because poverty varies with society. It was noted that the convictions on poverty across provinces is not similar. Furthermore, the developed poverty measure in this study should be extended across the whole of Sub-Saharan Africa to determine trend poverty trends. It is recommended that future studies add more dimensions to poverty measurement so that significant aspects of human deprivation are ultimately measured.

ANNEXURE A1 WARDS CLASSIFICATION OF RESPONDANTS: MAIN SURVEY

Ward	HHs sampled	Classification	Areas
1	25	Rural	Hopley Farm, Churu Farm, Ushewokunze, Crest Breeders, Southern Park
2	8	Medium Density	Arcadia, Braeside, Eastlea North & South, Cranborne, Queensdale, St Martins
3	5	High Density	Mbare Flats, Joburg Lines, Bus Ranks, Matapi Flats, Harare Flats, Mai Musodzi
4	3	High Density	Mbare
5	5	Medium Density	Milton Park, Monavale, Ridgeview, Belvedere
6	6	High Density	CBD, Flyover Mbare, Rotten Row up to Kensington
7	7	Medium Density	Alexandra Park, Avondale, Belgravia, Gunhill, Strathaven
8	6	Low Density	Newlands, Highlands, Rhodesview, Chisipite, Part of Eastlea, Part of Gunhill, Borrowdale Race Course, Ballantyne Park
9	11	Low Density	Greendale, Mandara, Shawasha Hills, Chikurubi, Msasa
10	5	High Density	Sunningdale
11	4	High Density	Mbare
12	5	High Density	Mbare
13	5	Medium Density	Rugare, Lochinvar, Lytton, Heavy Industry
14	7	High Density	Kambuzuma Westwood
15	14	High Density	Westlea, Cold Comfort
16	10	Medium Density	Greencroft, Sundridge, Bluffhill Industrial, Sentosa, St Andrews Park, Ashdown, Bloomingdale, Mabelreign, Haig Park, Ashdown

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province

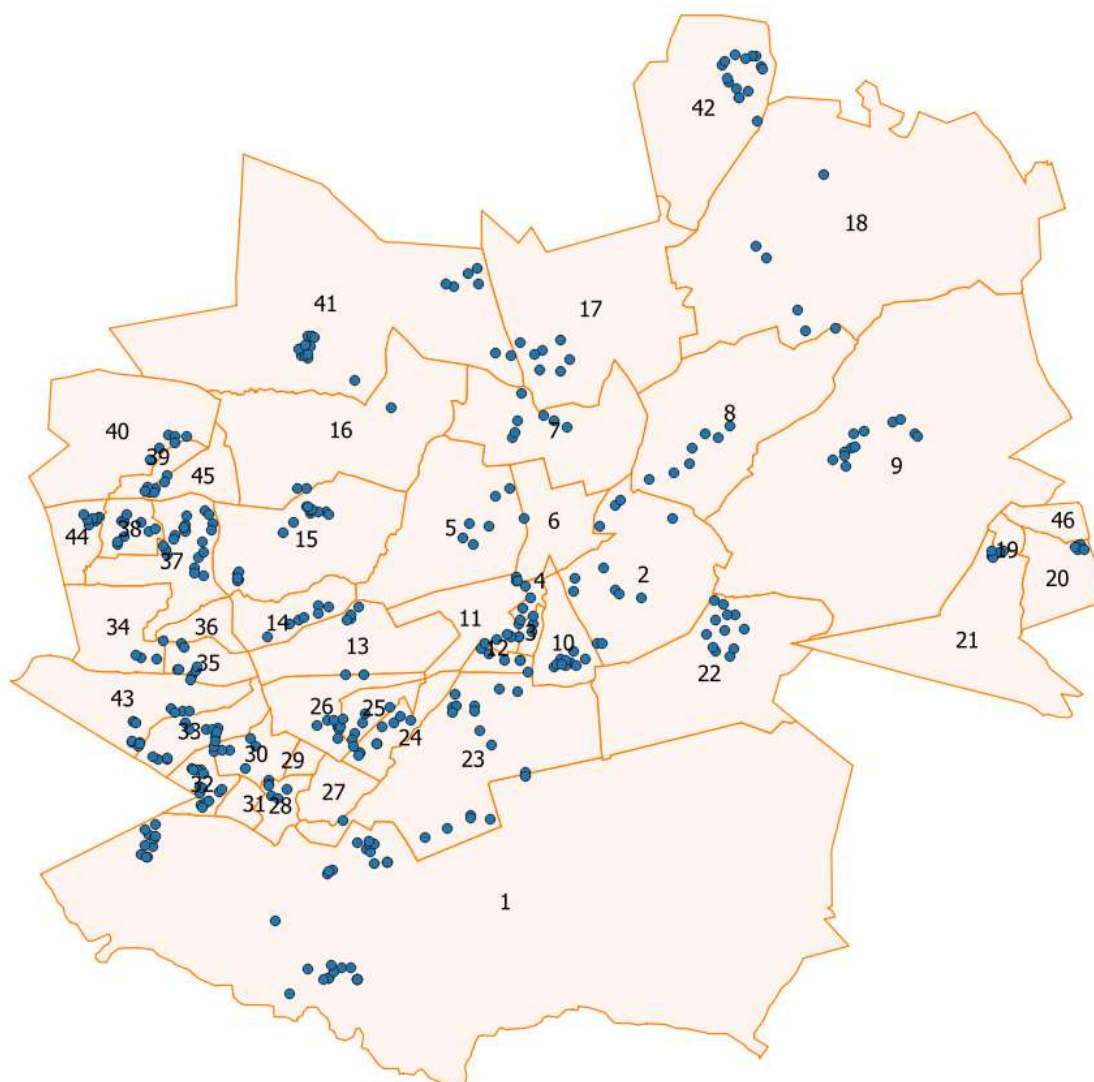
			Park, Tynwald, Westlea West, Mkwisi Gardens, Merick Park
17	7	Low Density	Mount Pleasant
18	9	Low Density	Glen Lorne, Philadelphia, Borrowdale Brooke, Hogerty Hill, Umwinsidale
19	5	High Density	Mabvuku
20	5	High Density	Tafara
21	5	High Density	Mabvuku
22	8	Medium Density	Hatfield, Chadcombe, Masasa Park
23	13	High Density	Houghton Park, Mainway Meadows, Parktown, Uphill, Ardbennie, Waterfalls

ANNEXURE A2

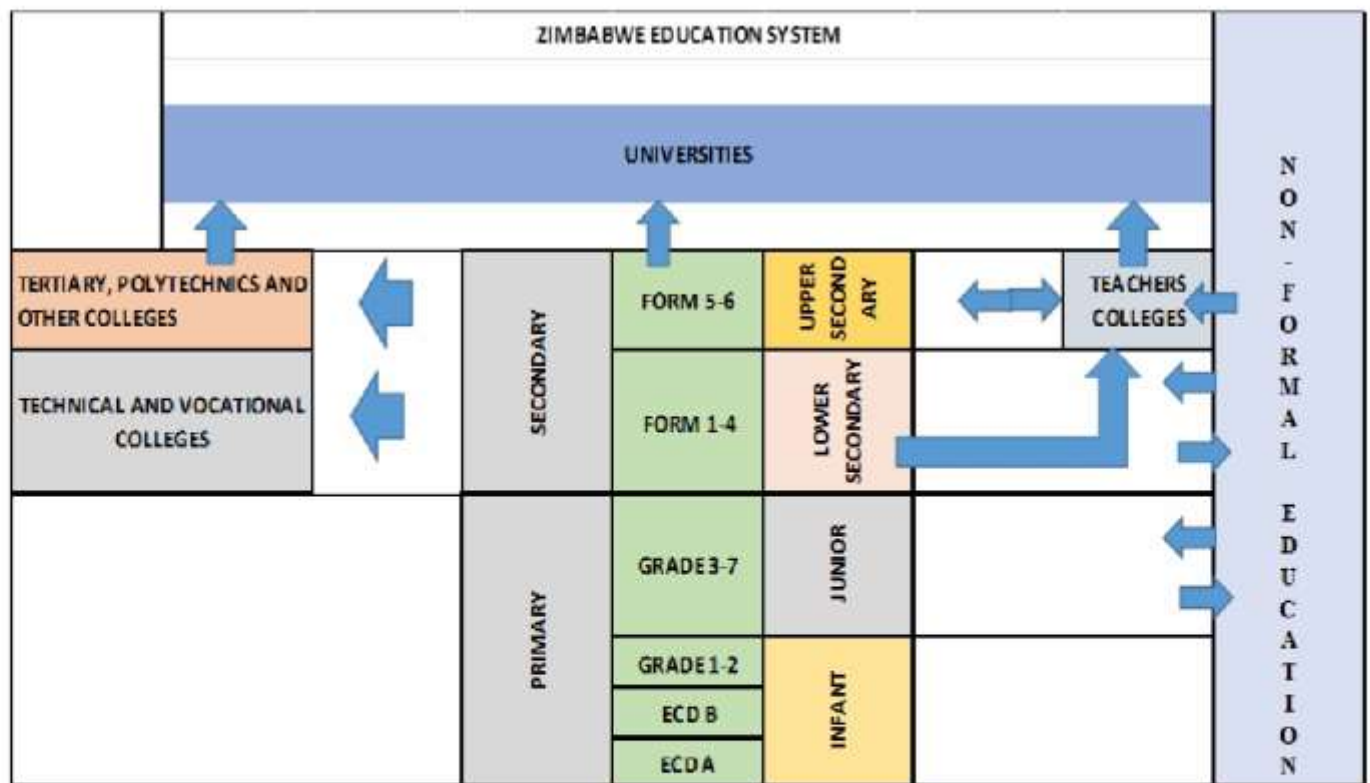
24	7	High Density	Highfields, New Ardbennie
25	7	High Density	Highfields, Machipisa, Old Highfield, part of Canaan, Willowvale
26	9	High Density	Highfields, part of New Canaan
27	7	High Density	Glen Norah B & C, part of Glen Norah Park
28	6	High Density	Glen Norah A Chitupu, New Glen View 7
29	3	High Density	Glen Norah, Part of Glen Norah Park
30	12	High Density	Glen View 8 & 3
31	5	High Density	Glen View 1 & part of 7
32	8	High Density	Glen View 1, 2, 3 & 4
33	13	High Density	Budiriro 1, 2 & 3
34	4	High Density	Crowbrough Way to Mhishi Shops, Mazai
35	5	High Density	Old Marimba, Magandanga up to Crowbrough Way
36	3	High Density	New Marimba, OK Shops, Cherima
37	16	High Density	Kuwadzana 1, 2, 3, 4, Crowbrough North and Northern side of Cherima
38	8	High Density	Kuwadzana 5, 6, & 7
39	8	High Density	Dzivaresekwa 1, 3 & 4
40	8	High Density	Dzivaresekwa 2, Extension, Dzivaresekwa 3
41	12	Low Density	Emerald Hill, Avonlea, Marlborough, Bluff Hill, Westgate, part of Tynwald
42	10	High Density	Hatcliffe
43	13	High Density	Budiriro 4 & 5

44	6	High Density	Kuwadzana Extension
45	6	High Density	Tynwald South, Kuwadzana 3
46	2	High Density	New Mabvuku, Tafara

ANNEXURE B: MAP OF HARARE SHOWING HOUSEHOLDS WHO PARTICIPATED IN EACH WARD



ANNEXURE C: ZIMBABWE EDUCATION SYSTEM



Zimbabwe Education System

Source: Ministry of Primary and Secondary Education 2019.

ANNEXURE D: PEARSON CHI-SQUARE TESTS ON MPI DIMENSIONS

Pearson Chi-Square Tests on MPI dimensions

		location
Education dimension	Chi-square	17.008
	df	3
	Sig.	.001 [*]
Helath dimension	Chi-square	22.951
	df	3
	Sig.	.000 [*]
Standard of Living	Chi-square	30.091
	df	3
	Sig.	.000 [*]
Economic Security	Chi-square	12.711
	df	3
	Sig.	.005 [*]
Empowerment & Participation	Chi-square	3.958
	df	3
	Sig.	.266 ^b
Environment and Public Infrastructure	Chi-square	45.676
	df	3
	Sig.	.000 [*]
Food insecurity and adaptation	Chi-square	25.408
	df	3
	Sig.	.000 [*]

ANNEXURE E: INDICATOR VARIABLES IN THE EQUATION

Indicator	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
B1 level of education of the respondent	22.563	4021.033	0.000	1	0.996	6294176705.672	0.000	
B3 5-16 years not attending school	5.440	2.065	6.938	1	0.008*	230.423	4.023	13198.417
B5 School materials/needs affordability	4.642	1.414	10.782	1	0.001*	103.725	6.496	1656.272
C1 distance (Km) from nearest health facility	2.186	1.053	4.311	1	0.038*	8.896	1.130	70.019
C3 household record of seriously illness	1.555	0.939	2.742	1	0.098	4.735	0.752	29.833
C5 access to healthcare needs	2.138	1.909	1.254	1	0.263	8.482	0.201	357.571
C10 household health insurance	1.746	0.910	3.685	1	0.055	5.734	0.964	34.100
D2 House size	5.646	1.544	13.370	1	0.000*	283.219	13.731	5841.668
Sanitation	15.169	5622.186	0.000	1	0.998	3872452.972	0.000	
D7 Primary source of cooking fuel	-3.520	1.532	5.276	1	0.022*	0.030	0.001	0.597
D8 Primary source of drinking water	0.355	1.192	0.089	1	0.766	1.426	0.138	14.756
D13 Affordability to pay water fees for	1.837	1.075	2.922	1	0.087	6.281	0.764	51.640
E1 Employment status of household head	2.592	1.094	5.620	1	0.018*	13.360	1.567	113.920
E3 other household members employed	5.646	1.394	16.406	1	0.000*	283.046	18.426	4347.841
E5 estimated total household income	1.635	1.084	2.275	1	0.132	5.128	0.613	42.918
Asset ownership	4.371	1.349	10.494	1	0.001*	79.143	5.621	1114.340
E22 Land ownership	5.244	1.916	7.494	1	0.006*	189.369	4.434	8087.062
E26 Donor/ Government Financial assistance	5.220	3.975	1.725	1	0.189	184.882	0.077	446810.769
E29 Financial inclusion	2.009	1.096	3.364	1	0.067	7.458	0.871	63.852
G1HH mode of transport	1.956	1.701	1.322	1	0.250	7.074	0.252	198.473
G2 nature of roads infrastructure	4.459	1.316	11.484	1	0.001*	86.365	6.553	1138.244
G4 Pollution	4.301	1.340	10.299	1	0.001*	73.780	5.335	1020.375
I22 Skip meals	3.676	1.212	9.206	1	0.002*	39.500	3.675	424.572
I27 Borrowed food, or rely on help from friends	5.681	1.368	17.253	1	0.000*	293.326	20.096	4281.389
I30 Sent household members to beg	10.686	6624.774	0.000	1	0.999	43751.837	0.000	
I31 Gathered wild vegetables	1.516	1.545	0.963	1	0.326	4.556	0.220	94.138
Constant	-31.510	7.342	18.422	1	0.000*	0.000		

ANNEXURE F: DIMENSION CUTOFF FOR DEPRIVATION IS 1/3 OF EACH DIMENSION (1/3 OF 1/7).

		location									
		Rural		High density		Medium Density		Low density		Total	
		N	N %	N	N %	N	N %	N	N %	N	N %
Education dimension	Not Poor	23	42.6%	156	67.8%	41	74.5%	45	73.8%	265	66.3%
	Poor	31	57.4%	74	32.2%	14	25.5%	16	26.2%	135	33.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%
Health dimension	Not Poor	23	42.6%	142	61.7%	36	65.5%	52	85.2%	253	63.2%
	Poor	31	57.4%	88	38.3%	19	34.5%	9	14.8%	147	36.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%
Standard of Living	Not Poor	36	66.7%	205	89.1%	53	96.4%	58	95.1%	352	88.0%
	Poor	18	33.3%	25	10.9%	2	3.6%	3	4.9%	48	12.0%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%
Economic Security	Not Poor	1	1.9%	28	12.2%	13	23.6%	11	18.0%	53	13.3%
	Poor	53	98.1%	202	87.8%	42	76.4%	50	82.0%	347	86.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%
Empowerment & Participation	Not Poor	3	5.6%	3	1.3%	1	1.8%	2	3.3%	9	2.3%
	Poor	51	94.4%	227	98.7%	54	98.2%	59	96.7%	391	97.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%
Environment and Public Infrastructure	Not Poor	4	7.4%	13	5.7%	12	21.8%	22	36.1%	51	12.8%
	Poor	50	92.6%	217	94.3%	43	78.2%	39	63.9%	349	87.3%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%
Food insecurity and adaptation	Not Poor	21	38.9%	130	56.5%	35	63.6%	51	83.6%	237	59.3%
	Poor	33	61.1%	100	43.5%	20	36.4%	10	16.4%	163	40.8%
	Total	54	100.0%	230	100.0%	55	100.0%	61	100.0%	400	100.0%

Researcher's calculations using SPSS

ANNEXURE G: MODEL INSIGNIFICANT VARIABLES

Indicator	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
B1 level of education of the respondent	22.563	4021.033	0.000	1	0.996	6294176705.672	0.000	
C3 household record of seriously illness	1.555	0.939	2.742	1	0.098	4.735	0.752	29.833
C5 access to healthcare needs	2.138	1.909	1.254	1	0.263	8.482	0.201	357.571
C10 household health insurance	1.746	0.910	3.685	1	0.055	5.734	0.964	34.100
Sanitation	15.169	5622.186	0.000	1	0.998	3872452.972	0.000	
D8 Primary source of drinking water	0.355	1.192	0.089	1	0.766	1.426	0.138	14.756
D13 Affordability to pay water fees for	1.837	1.075	2.922	1	0.087	6.281	0.764	51.640
E5 estimated total household income	1.635	1.084	2.275	1	0.132	5.128	0.613	42.918
E26 Donor/ Government Financial assistance	5.220	3.975	1.725	1	0.189	184.882	0.077	446810.769
E29 Financial inclusion	2.009	1.096	3.364	1	0.067	7.458	0.871	63.852
G1HH mode of transport	1.956	1.701	1.322	1	0.250	7.074	0.252	198.473
I30 Sent household members to beg	10.686	6624.774	0.000	1	0.999	43751.837	0.000	
I31 Gathered wild vegetables	1.516	1.545	0.963	1	0.326	4.556	0.220	94.138

Source: Researcher's own calculations using SPSS

ANNEXURE H: DECOMPOSITION OF DIMENSIONS AND INDICATORS CONTRIBUTION TO THE MPI

Dimension	Indicators	Population	Censored Headcount (Chi)	Ratio	weight (ci)	Contribution
Education 13.1%	B1 level of education of the respondent	179	0.098297639		0.03571428	0.0095
	B5 School materials/needs affordability	1372	0.75343218		0.03571428	0.0728
Health 14.2%	C1 Distance to nearest health facility (Km)'. C3 household seriously ill reports in 12 months	1534	0.842394289		0.02380952	0.0543
	C4 household affordability for serious illness treatment	462	0.253706755		0.023809524	0.0163
	C5 access to healthcare	597	0.327841845		0.02380952	0.0211
	C9 health fitness and exercises?	114	0.062602965		0.02380952	0.0040
	C10 health insurance	0	-		0.02380952	-
		1318	0.723778144		0.02380952	0.0466
Standards of Living 6.4%	D1 ownership of dwelling	26	0.014277869		0.02040816	0.0008
	D2 House size	556	0.305326744		0.02040816	0.0169
	Sanitation	88	0.048325096		0.02040816	0.0027
	D7 Primary source of cooking	316	0.173531027		0.02040816	0.0096
	D8 Primary source of drinking water	515	0.282811642		0.02040816	0.0156
	d8.1 Distance to the primary source of drinking	0	0		0.02040816	-
	D13 affordability water fees	623	0.342119714		0.02040816	0.0189
Economic Security 22.9%	E1 Employment status of household head	427	0.234486546		0.02857142	0.0181
	E3 Employment status of other household	1178			0.64689730	0.028571429
	E5 estimated total household income	1175			0.64524986	0.028571429
	E8 Asset ownership	930			0.51070840	0.028571429

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	E22 Land ownership	1675		0.91982427	0.028571 429
Empowerment & Participation 15.5%	E24 Community decision making	1593		0.87479406	0.035714 286
	E26 Donor/ Government Financial assistance	1790		0.98297638	0.035714 286
	E31 economic or political opportunities than others because of their religion	1615		0.88687534	0.035714 286
	E29 Financial inclusion	596		0.32729269	0.035714 286
Environment and Public Infrastructure 18.7%	HH mode of transport	254		0.1394838	0.028571 429
	F2 Nature of roads infrastructure?	1552		0.85227896	0.028571 429
	Other public infrastructure accessed by the HH	1148		0.63042284	0.028571 429
	Pollution	1187		0.65183964	0.028571 429
	F7 Crime / violence	253		0.13893465	0.028571 429
Food insecurity and adaptation 9.2%	I22 Skip meals	782		0.42943437	0.028571 429
	I27 Borrowed food, or rely on help from friends	653		0.35859417	0.028571 429
	I29 Restricted adults from eating	653		0.35859417	0.028571 429
	I30 Sent household members to beg	77		0.04228445	0.028571 429
	I31 Gathered wild vegetables	300		0.16474464	0.028571 429

Source: Researcher's own calculations using SPSS

ANNEXURE I: MULTIPLE COMPARISONS

Multiple Comparisons						
Dependent Variable: Hhsize-hhsize_children						
Bonferroni						
(I) location	(J) location	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Rural	High density	.701*	.207	.005	.15	1.25
	Medium Density	.899*	.263	.004	.20	1.60
	Low density	1.035*	.256	.000	.35	1.71
High density	Rural	-.701*	.207	.005	-1.25	-.15
	Medium Density	.198	.206	1.000	-.35	.74
	Low density	.334	.198	.553	-.19	.86
Medium Density	Rural	-.899*	.263	.004	-1.60	-.20
	High density	-.198	.206	1.000	-.74	.35
	Low density	.136	.255	1.000	-.54	.81
Low density	Rural	-1.035*	.256	.000	-1.71	-.35
	High density	-.334	.198	.553	-.86	.19
	Medium Density	-.136	.255	1.000	-.81	.54
*. The mean difference is significant at the 0.05 level.						

Source: Researcher's own calculations using SPSS

ANNEXURE J: RELATIONSHIP BETWEEN SCHOOL ATTENDANCE AND HOUSEHOLD AFFORDABILITY OF SCHOOL FEES

		B3 Do you have any children who is (are) not attending school between 5-16 years			
		Yes		No	
		Count	Column N %	Count	Column N %
B5 Can your household afford your children's school fees and school supplies? ⁸	no	14	19.4%	15	8.5%
	rarely	15	20.8%	20	11.3%
	Sometimes	12	16.7%	33	18.6%
	Usually,	14	19.4%	66	37.3%
	yes	12	16.7%	38	21.5%
	Household does not pay the fees and cannot afford supplies	2	2.8%	0	0.0%
	Household does not pay fees, but can afford supplies	0	0.0%	0	0.0%
	Household does not pay fees or supply costs	0	0.0%	3	1.7%
	N/A	3	4.2%	2	1.1%

Source: Researcher's own calculations using SPSS

ANNEXURE K: PEARSON CHI-SQUARE TESTS: RELATIONSHIP BETWEEN B3 AND B5

Pearson Chi-Square Tests: Relationship between B3 and B5

		B3 Do you have any children who is (are) not attending school between 5-16 years
B5 Can your household afford your children's school fees and school supplies?8	Chi-square	22.856
	df	7
	Sig.	.002 ^{*,b,c}

Source: Researcher's own using SPSS

Results are based on nonempty rows and columns in each innermost sub table.

*. The Chi-square statistic is significant at the .05 level.

b. More than 20% of cells in this sub table have expected cell counts less than 5. Chi-square results may be invalid.

c. The minimum expected cell count in this sub table is less than one. Chi-square results may be invalid.

ANNEXURE L: MULTICOLLINEARITY TEST: MPI INDICATORS

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.407	.136		-2.990	.003		
	B1 What is the level of education of the respondent?	-.019	.056	-.013	-.341	.733	.726	1.377
	B3 Do you have any children aged between 5-16 not attending school?	.048	.040	.044	1.208	.228	.815	1.227
	B5 School materials/needs affordability	.200	.035	.206	5.762	.000	.839	1.192
	C1 How far are you located from the nearest health facility? (Km)'.	.110	.045	.088	2.431	.016	.817	1.224
	C3 In the last 12 months, how often have someone in your household been seriously ill (meaning they are so ill that they	.053	.035	.052	1.482	.139	.870	1.149
	C5 For the majority of the households in your area, who have a better chance of receiving healthcare when in need?	.110	.059	.065	1.850	.065	.878	1.139
	C10 Does your household members have health insurance?	.064	.040	.064	1.616	.107	.683	1.464
	D2 House size	.062	.035	.065	1.752	.081	.772	1.295
	Sanitation	-.071	.075	-.038	-.948	.344	.658	1.519
	D7 Primary source of cooking	-.026	.047	-.022	-.539	.590	.622	1.609
	D8 Primary source of drinking water	.016	.037	.016	.431	.666	.737	1.357

D13 Can your household afford to pay the fees for using water from your household's main water source?	.061	.034	.067	1.829	.068	.792	1.263
E1 What is the Employment status of household head	-.003	.036	-.003	-.093	.926	.820	1.219
E3 How many other members from the household are employed?	.214	.034	.231	6.280	.000	.794	1.260
E5 What is your estimated total household income per month inclusive of all sources? \$..	.208	.040	.226	5.242	.000	.579	1.728
Asset ownership	.145	.038	.168	3.846	.000	.563	1.775
E22 Land ownership	.061	.061	.035	.995	.320	.877	1.140
E26 Donor/ Government Financial assistance	.165	.113	.051	1.467	.143	.885	1.130
E29 Financial inclusion	.055	.038	.061	1.430	.154	.595	1.681
G1HH mode of transport	.036	.043	.030	.844	.399	.842	1.188
G2 What is the nature of your roads infrastructure?	.019	.022	.042	.866	.387	.454	2.202
G4 Pollution	.155	.035	.172	4.370	.000	.693	1.443
I22 Skip meals	.033	.036	.038	.924	.356	.638	1.566
I29 Restricted adults from eating in order for smaller children to eat	.155	.034	.174	4.612	.000	.756	1.323
I30 Sent household members to beg	-.035	.073	-.017	-.479	.632	.834	1.198
I31 Gathered wild vegetables	-.006	.044	-.005	-.136	.892	.761	1.314
a. Dependent Variable: Is the household poor							

Source: Researcher's own calculations using SPSS

ANNEXURE M: POVERTY PERCEPTIONS: SIGNIFICANT PREDICATORS

			Score	df	Sig.
Step 0	Variables	H1 They lack the ability to manage money	17.809	1	0.000
		H2 They waste their money on inappropriate items	26.372	1	0.000
		H3 They do not actively seek to improve their lives	50.457	1	0.000
		H4 They are exploited by rich people	47.108	1	0.000
		H5 The society lacks social justice	43.064	1	0.000
		H6 Distribution of wealth in the society is uneven	36.210	1	0.000
		H7 They lack opportunities due to the fact that they live in poor families	10.844	1	0.001
		H8 They live in places where there are not many opportunities	0.227	1	0.634
		H10 They have bad luck	6.586	1	0.010
		H12 They are not motivated because of welfare	13.945	1	0.000
		H13 They are born inferior	12.438	1	0.000
		H14 Over the last 10 years, poverty in Harare has been increasing?	8.265	1	0.004
		H15 And over the next 10 years, poverty in Harare will be higher than today?	11.499	1	0.001
		H16 Poverty is inevitable and its part of life?	22.771	1	0.000
		H17 They lack insurance	3.853	1	0.050
	Overall Statistics		94.486	15	0.000

Source: Researcher's own calculations using SPSS

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ANNEXURE N: PEARSON CHI-SQUARE TESTS: POVERTY PERCEPTIONS

Pearson Chi-Square Tests: Poverty Perceptions

Is the household
poor

H1 They lack the ability to manage money	Chi-square	24.828
	df	4
	Sig.	.000*
H2 They waste their money on inappropriate items	Chi-square	40.246
	df	4
	Sig.	.000*
H3 They do not actively seek to improve their lives	Chi-square	62.925
	df	4
	Sig.	.000*
H16 Poverty is inevitable and its part of life?	Chi-square	25.977
	df	4
	Sig.	.000*
H4 They are exploited by rich people	Chi-square	55.998
	df	4
	Sig.	.000*
H5 The society lacks social justice	Chi-square	47.554
	df	4
	Sig.	.000*
H6 Distribution of wealth in the society is uneven	Chi-square	40.944
	df	4
	Sig.	.000*
H7 They lack opportunities due to the fact that they live in poor families	Chi-square	10.907
	df	4
	Sig.	.028*
H8 They live in places where there are not many opportunities	Chi-square	16.882
	df	4
	Sig.	.002*
H9 They have bad fate	Chi-square	7.356
	df	4
	Sig.	.118
H10 They have bad luck	Chi-square	17.958
	df	4
	Sig.	.001*
H11 They have encountered misfortunes	Chi-square	8.233
	df	4
	Sig.	.043
H12 They are not motivated because of welfare	Chi-square	20.714
	df	4
	Sig.	.000*
H13 They are born inferior	Chi-square	14.696
	df	4
	Sig.	.005*

Source: Researcher's own using SPSS

Results are based on nonempty rows and columns in each innermost sub table.

*. The Chi-square statistic is significant at the .05 level.

ANNEXURE O: MULTICOLLINEARITY TEST: PERCEPTIONS

		Coefficients ^a				Collinearity Statistics		
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF
Model		B	Std. Error	Beta				
1	(Constant)	.967	.129		7.488	.000		
	H1 They lack the ability to manage money	-.038	.023	-.127	-1.619	.106	.324	3.087
	H2 They waste their money on inappropriate items	.037	.025	.118	1.512	.131	.327	3.061
	H3 They do not actively seek to improve their lives	.053	.021	.189	2.576	.010	.371	2.698
	H4 They are exploited by rich people	-.036	.017	-.124	-2.085	.038	.566	1.766
	H5 The society lacks social justice	-.030	.019	-.105	-1.586	.114	.450	2.224
	H6 Distribution of wealth in the society is uneven	-.011	.020	-.035	-.550	.583	.480	2.083
	H7 They lack opportunities due to the fact that they live in poor families	.041	.019	.141	2.192	.029	.478	2.091
	H8 They live in places where there are not many opportunities	-.024	.019	-.079	-1.236	.217	.487	2.053
	H10 They have bad luck	.009	.017	.026	.520	.603	.787	1.270
	H12 They are not motivated because of welfare	-.011	.017	-.034	-.633	.527	.702	1.425
	H13 They are born inferior	-.021	.019	-.059	-1.123	.262	.715	1.399
	H14 Over the last 10 years, poverty in Harare has been increasing?	-.049	.028	-.089	-1.769	.078	.793	1.261
	H15 And over the next 10 years, poverty in Harare will be higher than today?	-.008	.021	-.020	-.381	.703	.719	1.392
	H16 Poverty is inevitable and it is part of life?	-.034	.015	-.122	-2.307	.022	.717	1.395
	H17 They lack insurance	.021	.018	.058	1.171	.242	.811	1.233

a. Dependent Variable: Is the household poor

Source: Researcher's own calculations using SPSS

ANNEXURE P: PERCEPTIONS OF POVERTY: RESULTS

			Is the household poor		
			Not Poor	Poor	Total
			Column N %	Column N %	Column N %
Individualistic	H1 They lack the ability to manage money	Strongly agree	21.0%	10.2%	13.0%
		Agree	22.9%	15.3%	17.3%
		Neither agree nor disagree	16.2%	7.8%	10.0%
		Disagree	11.4%	23.7%	20.5%
		Strongly disagree	28.6%	43.1%	39.3%
	H2 They waste their money on inappropriate items	Strongly agree	21.0%	8.5%	11.8%
		Agree	25.7%	16.9%	19.3%
		Neither agree nor disagree	19.0%	6.8%	10.0%
		Disagree	14.3%	33.6%	28.5%
		Strongly disagree	20.0%	34.2%	30.5%
	H3 They do not actively seek to improve their lives	Strongly agree	43.8%	11.9%	20.3%
		Agree	17.1%	14.6%	15.3%
		Neither agree nor disagree	7.6%	3.1%	4.3%
		Disagree	12.4%	30.8%	26.0%
		Strongly disagree	19.0%	39.7%	34.3%
	H16 Poverty is inevitable and it is part of life?	Strongly agree	7.6%	26.1%	21.3%
		Agree	8.6%	17.6%	15.3%
		Neither agree nor disagree	15.2%	10.5%	11.8%
		Disagree	21.0%	14.9%	16.5%
		Strongly disagree	47.6%	30.8%	35.3%
Structural	H4 They are exploited by rich people	Strongly agree	14.3%	30.5%	26.3%
		Agree	11.4%	30.8%	25.8%
		Neither agree nor disagree	6.7%	6.8%	6.8%
		Disagree	24.8%	19.7%	21.0%
		Strongly disagree	42.9%	12.2%	20.3%
	H5 The society lacks social justice	Strongly agree	10.5%	26.8%	22.5%
		Agree	7.6%	25.1%	20.5%
		Neither agree nor disagree	7.6%	9.2%	8.8%
		Disagree	21.9%	18.0%	19.0%
		Strongly disagree	52.4%	21.0%	29.3%
	H6 Distribution of wealth in the society is uneven	Strongly agree	16.2%	30.5%	26.8%
		Agree	21.0%	38.6%	34.0%
		Neither agree nor disagree	10.5%	7.1%	8.0%
		Disagree	17.1%	12.5%	13.8%

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province

	H7 They lack opportunities due to the fact that they live in poor families	Strongly disagree	35.2%	11.2%	17.5%
		Strongly agree	49.5%	35.3%	39.0%
		Agree	28.6%	26.8%	27.3%
		Neither agree nor disagree	3.8%	4.1%	4.0%
		Disagree	9.5%	15.3%	13.8%
		Strongly disagree	8.6%	18.6%	16.0%
Fatalistic	H8 They live in places where there are not many opportunities	Strongly agree	16.2%	26.8%	24.0%
		Agree	32.4%	29.5%	30.3%
		Neither agree nor disagree	19.0%	6.8%	10.0%
		Disagree	17.1%	15.9%	16.3%
		Strongly disagree	15.2%	21.0%	19.5%
	H9 They have bad fate	Strongly agree	4.8%	9.2%	8.0%
		Agree	6.7%	14.6%	12.5%
		Neither agree nor disagree	8.6%	7.1%	7.5%
		Disagree	23.8%	22.0%	22.5%
		Strongly disagree	56.2%	47.1%	49.5%
		Total	100.0%	100.0%	100.0%
	H10 They have bad luck	Strongly agree	4.8%	8.5%	7.5%
		Agree	2.9%	16.3%	12.8%
		Neither agree nor disagree	13.3%	6.4%	8.3%
		Disagree	22.9%	20.3%	21.0%
		Strongly disagree	56.2%	48.5%	50.5%
		Total	100.0%	100.0%	100.0%
	H11 They have encountered misfortunes	Strongly agree	12.4%	9.8%	10.5%
		Agree	23.8%	15.3%	17.5%
		Neither agree nor disagree	11.4%	9.2%	9.8%
		Disagree	11.4%	21.0%	18.5%
		Strongly disagree	41.0%	44.7%	43.8%
		Total	100.0%	100.0%	100.0%
	H12 They are not motivated because of welfare	Strongly agree	5.7%	9.8%	8.8%
		Agree	6.7%	15.3%	13.0%
		Neither agree nor disagree	0.0%	5.4%	4.0%
		Disagree	13.3%	19.0%	17.5%
		Strongly disagree	74.3%	50.5%	56.8%
		Total	100.0%	100.0%	100.0%
	H13 They are born inferior	Strongly agree	3.8%	8.8%	7.5%
		Agree	1.9%	8.8%	7.0%
		Neither agree nor disagree	1.0%	4.4%	3.5%
		Disagree	17.1%	19.7%	19.0%
		Strongly disagree	76.2%	58.3%	63.0%

		Total	100.0%	100.0%	100.0%

Calculation of (P_0 , P_1 and P_2) for durational poverty

	$((Z-Y)/Z)^0$	$((Z-Y)/Z)^1$	$((Z-Y)/Z)^2$
2010	82	23.95	9.89
2011	104	31.66666667	14.31555556
2012	112	34.30666667	15.84195556
2013	124	36.28	16.16088889
2014	130	39.29333333	17.61937778
2015	153	44.65333333	19.74737778
2016	197	59.97333333	26.80248889
2017	214	64.86666667	28.94773333
2018	237	72.8	32.50737778
2019	262	84.24	38.06968889
2020	278	92.4	42.4064

Researcher's own calculations using adjusted FGT model



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Economic and Management Sciences Research
Ethics Committee (EMS-REC)

17 August 2020

Prof S Dunga and Dr E Redda
Per e-mail
Dear Prof Dunga and Dr Redda,

EMS-REC FEEDBACK: 31072020

Student: Gaba, F (33458839)(NWU-00785-20-A4)

Applicant: Prof S Dunga / Dr E Redda – PhD in Economics

Your ethics application on, *An investigation of circumstantial and durational urban poverty by adapting and developing a new multidimensional measure in the case of Harare province*, which served on the EMS-REC meeting of 31 July 2020, refers.

Outcome:

Approved as a minimal risk study. A number NWU-00785-20-A4 is given for one year of ethics clearance.

Due to the Covid-19 lock down ethics clearance for applications that involve data collection or any form of contact with participants are subject to the restrictions imposed by the South African government.

Kind regards,

**Mark
Rathbone**

Digitally signed by Mark Rathbone
DN: cn=Mark Rathbone, o=North West
University, ou=Economic and Management
Sciences Research Ethics Committee,
c=ZA
Date: 2020.08.19 08:50:49 +0200

Prof Mark Rathbone

Chairperson: Economic and Management Sciences Research Ethics Committee (EMS-REC)



North West University
Faculty of Economic and Management Sciences
Vaal Triangle Campus, NWU
Office: Bld 4, 212
Tel: +27 16 910 3372
29 August 2020

CONFIRMATION LETTER: FARAI GABA: ID 07-149621-B-07: PASSPORT CN029290: NORTH WEST UNIVERSITY STUDENT

DEAR SIR/ MADAM

This letter serves to confirm that Farai Gaba a citizen of Zimbabwe, National ID 07-149621B07 and passport number CN029290 is a Doctoral Student of Economics at North West University, Vanderbijlpark Campus. Farai's university registration number is 33458839.

Farai is doing a study titled: An investigation of circumstantial and durational urban poverty by adapting and developing a new multidimensional measure in the case of Harare province. We therefore seek your assistance in giving student clearance to carry out his field work. His study received ethical clearance and we require clearance from Zimbabwe for the student to conduct field study within Harare.

Please do not hesitate to call me or email me if you have any other questions pertaining to this request.

Your cooperation is greatly appreciated.

Yours sincerely

Professor Steven Henry Dunga
Programme Leader Economics
Faculty of Economic and Management Sciences
Email: Steve.Dunga@nwu.ac.za



North West University
Faculty of Economic and Management
Sciences
Vaal Triangle Campus, NWU

The Permanent Secretary
Ministry of Public Service, Labour and Social Welfare
9th Floor Kaguvi Building
Harare

8 September 2020

**APPLICATIONS FOR GATE PASS TO CARRYOUT FIELD STUDY: HARARE
PROVINCE: AT WARDS BASED BY FOR PhD ECONOMICS STUDY: FARAI
GABA: ID 07-149621-B-07: PASPPORT: CN029290: CONTACT: 0778607277**

Dear Sir/Madam

My name is Farai Gaba ID Number 07- 149621-B-07 and Passport Number CN 029290, PhD student at North West University South Africa, University Number 33458839. I am writing to apply for a gate pass to carryout field work in Harare.

The research study is titled: An investigation of circumstantial and durational urban poverty by adapting and developing a new multidimensional measure in the case of Harare province. This study is ward based and six research assistants will be involved in data collection. The study is being supervised by Professor Steve Henry Dunga and Dr Ephrem Redda who can be contacted on Steve.Dunga@nwu.ac.za and Ephrem.Redda@nwu.ac.za, University telephone: Tel: +27 16 910 3372.

Your cooperation is greatly appreciated.

Yours sincerely

Farai Gaba

PhD Research Assistant Economics North West University
Faculty of Economic and Management Sciences
Vaal Triangle Campus, NWU, Email: faraigaba@gmail.com/ 077860727

SW/4/12 Correspondence should not be addressed to individuals



ZIMBABWE

Telephone : (04) 704085 / 703871 / 703585
5Fax : (04) 700393

MINISTRY OF PUBLIC SERVICE LABOUR
AND SOCIAL WELFARE
9th Floor, Kaguvu Building
P O Box CY 17

Causeway
HARARE



Ref/SW 4/12

08 September 2020

Mr Farai Gaba
C/o Public Service Commission

**PERMISSION TO CARRY OUT AN ACADEMIC RESEARCH ON TOPIC
ENTITLED "AN INVESTIGATION OF CIRCUMSTANTIAL AND DURATIONAL
URBAN POVERTY BY ADAPTING AND DEVELOPING A NEW
MULTIDIMENSIONAL MEASURE IN THE CASE OF HARARE PROVINCE".**

Receipt of your letter dated 08 September 2020 with the above mentioned matter is acknowledged.

Please be advised that permission is hereby granted for you to carry out a research on a topic entitled "AN INVESTIGATION OF CIRCUMSTANTIAL AND DURATIONAL URBAN POVERTY BY ADAPTING AND DEVELOPING A NEW MULTIDIMENSIONAL MEASURE IN THE CASE OF HARARE PROVINCE". **Permission** is granted **STRICTLY** on condition that the research is for academic purposes only in pursuit of your Phd in Economics. The data collected should not be shared to third parties.

You are kindly requested to submit a copy of your final research document to the Department of Social Development upon completion as your research has a bearing to the Department's mandate.

S. Masanga

SECRETARY PUBLIC SERVICE, LABOUR AND SOCIAL WELFARE



QUESTIONNAIRE

HARARE PROVINCE

WARD N0

Dear Harare Province Resident

A questionnaire is being undertaken for a study thesis on: An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province. The study is aimed at household heads or their spouses who stay in Harare province and are above the age of 18 years. The study is intended to both male and female households who stay in any of the 46 wards of Harare province.

It will be most appreciated if you could assist by participating in completion of the electronic questionnaire which has 137 questions in 9 distinct sections. The questionnaire will take between 15-20 minutes of your time for you to complete all questions. The study is being done in line with COVID-19 WHO regulations and government of Zimbabwe COVID-19 lockdown restrictions. Staff will advise you further regarding social distancing, wearing of masks and sanitization of hands.

Your responses will be treated in strict confidentiality at all times and be assured that your credentials will never be disclosed to anyone. The ward marking on your questionnaire is to make sure your responses are entered in the ward you stay. Kindly be advised that the responses will automatically be send to the server Open Data Kit server at the end of the interview. The questions are structured such that there is no room for blank responses permissible.

Please answer all questions as honestly and accurately as possible. Please note there are no wrong answers in this study and respondents can stop at any time or stage if they wish so as participation remains voluntary and if you choose to stop the

questionnaire you will not be disadvantaged in any way, however your full participation is most welcome.

The study has been classified as minimum risk, as the potential harm or discomfort you experience from participating in the study is not greater than what you experience in your ordinary life.

The questionnaire copies will be captured into electronic password-protected data file and securely stored by the research supervisor at North West University, who is the custodian of the study material. The study findings will be reported in the thesis and the final report held by North West University. Nonetheless, the research findings may be anonymously presented at peer academic reviews, journal publications or presentation at academic conferences.

Thank you very much for completing the questionnaire.

By completing this questionnaire, you give consent that this information may be used for research purposes.

If you have **ANY** questions or concerns, you are welcome to contact the researchers:

	Researcher: Farai Gaba <i>PhD Candidate:</i> <i>Economics</i> faraigaba@gmail.com +263 778 607 277	Research Promotor: Prof. Steve. Dunga <i>Associate Professor:</i> <i>Economics</i> steve.dunga@nwu.ac.za +27169103372	Co-research Promotor: Prof. Ephrem. Redda <i>Economics</i> ephrem.redda@nwu.ac.za +27781409884

Yours Faithfully

Farai Gaba

North West University

PhD Student

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province

BIOLOGICAL INFORMATION USE IN THE STUDY:

Biological information requested in section A will only be used to describe the composition of the sample and will not be used to compare groups or make inferences about individuals.

Please note that the head of the household should preferably answer the questionnaire (Mark with an X or ✓)

A		BACKGROUND INFORMATION						
	A1	What is the position of the respondent in the household?			Head (0) 		Spouse (1) 	
	A2	Gender			Male		Female	
	A3	Marital status of the household head	Single (1) 	Married (2) 	Widowed (3) 	Divorced (4) 	Separated (5) 	
	A4	Household size: How many female and male adults (age 18 and older) live and sleep in your home more than 9 months every year? Female Male Children below 18 yrs Household Total						
	A5	Household head(spouse) age years						
	A6	How long has the household been staying here?	Below 1 year 	1-5 years 	6-10 years 	11-15 years 	Over 15 years 	
B		EDUCATION AND LITERACY DIMENSION AND INDICATORS						
	B1	What is the level of education of the respondent?	Primary and below 	Secondary 	Vocational 	University 		
	B2	What is the highest level of education in the family?	Primary and below 	Secondary 	Vocational 	University 		
	B3	Do you have any children who is (are) not attending school between 5-16 years ?					Yes	No

B4	What is the name of your religion?	Traditional ☐	Roman Catholic ☐	Protestant ☐
		☐ Other Christian ☐	Pentecostal ☐	Other ☐
		Muslim ☐	Apostolic Sect ☐	☐
B5	How long does it take, in minutes, for the school-age children (age 5-14) in your household to get to school (by any means: for example, walking, bicycle, scooter, bus)? minutes			
B6	Can your household afford your children's school fees and school supplies?			
	No ☐	Rarely ☐	Sometimes ☐	Usually ☐
	Yes ☐	Household does not pay the fees and cannot afford supplies ☐		
	Household does not pay fees, but can afford supplies ☐		Household does not pay fees or supplies ☐	
C	DIMENSION: HEALTH			
C1	Indicators:			
	How far are you located from the nearest health facility? km			
C2	In the last 12 months, how often have someone in your household been ill (any non-serious illness) such as flu?			
	Never ☐	Once or twice ☐	Once a month ☐	A few times a month ☐
	About once a week ☐	A few times a week ☐	Every day ☐	Don't know ☐
C3	In the last 12 months, how often have someone in your household been seriously ill (meaning they are so ill that they stay in bed, or lying down, for two or more days at a time)?			
	Never ☐	Once or twice ☐	Once a month ☐	A few times a month ☐
	About once a week ☐	A few times a week ☐	Every day ☐	Don't know ☐
C4	Can your household afford professional treatment for serious illness or injury?			
	No (1) Yes, if money is borrowed (2) Yes, with much difficulty (3) Yes, with some difficulty (4)			
	Yes, because government/ employer/ donor helps pay for treatment (5) Yes, household can afford it (6)			
C5	For the majority of the households in your area, who have a better chance of receiving healthcare when in need? Female ☐ Male ☐ Children ☐ Everyone ☐ None ☐			
C6	How many times in a week do most members (the majority) of your household clean their teeth?			
	Never (1) Rarely (2) One or two days a week (3) Most days of the week (4)			
	Usually once a day (5) Usually two or three times a day (6) Don't know (7)			
C7	Did you consult a doctor or visit a health facility in the last 6 months	Yes	No	
C8	What is the average Doctor/ clinic fees you pay per visit?			
C9	Does members in the household do health fitness and exercises?	Yes	No	
C10	If your answer in 8 is yes, how many members do health fitness and exercises? Number			
C11	Does your household members have health insurance? Yes ☐ No ☐			
C12	If answer is yes in 10, indicate for how long have they been on health insurance			

		_____ years	
D	DIMENSION LIVING STANDARDS Indicators: Housing, Sanitation, Cooking fuel, Primary source of drinking water,		
D1	Housing: What kind of ownership does your household have for your dwelling?		
	1. Illegal access, squatting	2. Employer/ government/donor assisted housing	
	3. Company owned	4. Borrowed from relatives	
	5. Rented for less than 12 months	Household owned house	
	7. Rented for over 12 months	Other: specify _____	
D2	How many rooms is your household using excluding toilets? a) one room b) two rooms c) three rooms d) four rooms e) five rooms f) six rooms g) Full house		
D3	What is the total square meters your family is using a) Below 50 sqm b) 51-100sqm b) 101-150sqm d) 151-200sqm e) above 200sqm		
	Sanitation		
D4	What kind of toilet facility is available for use to your household? a) Flush to piped sewer system b) Flush to septic tank c) Flush to pit (latrine) d) Pit latrine with slab e) Blair / open pit) f) No facilities or bush or field Other (specify) _____		
D5	Sanitation: Sharing Facility Do you share this toilet facility with other households?	yes	no
D6	How do you dispose your household refuse? i) city collection van iii) Other specify _____	ii) dumping bins	
D7	What is the primary source of cooking fuel for the household?		
D8	Approximately how much time (in minutes) does it take a member of your household to collect enough water for your household's drinking and for other domestic needs for a normal day during rain (wet) season and dry season? <i>[If water is collected from a piped supply in the household record "1" minute]</i> a) Rainy(wet) season: 1 minute 1min-10min 11min-20min 21min-30 min 31min-1hr 1-2hrs more than 2 hrs		
D9	Dry season: 1 minute 1min-10min 11min-20min 21min-30 min 31min-1hr 1-2hrs more than 2 hrs		
D10	Does your household treat water before drinking it (any treatment method: boiling, allowing to settle, filter, chemical treatment, etc.)?		
	Never	Rarely	Sometimes Often

		Always	No treatment is necessary			
	D11	During the last 12 months, how many months was your household's main source of water sufficient to meet your household's drinking, cooking, bathing and cleaning needs? _____ Months.				
	D12	How often do you worry there will not be enough water from your household's main water source to satisfy your household's drinking, cooking, bathing and cleaning needs?				
		Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
	D13	Can your household usually afford to pay the fees (direct payments only, not maintenance fees) for using water from your household's main water source?				
		No (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
		We do not need to pay for water (6)				
	D14	Generally, what do you think the quality of your households' water is?				
		Don't know (1)	Very bad (2)	Poor (3)	Fair (4)	
		Satisfactory (5)	Good (6)	Very good (7)		

E DIMENSION ECONOMIC SECURITY

Indicators: Assets, income and employment

E: A	E1	Employment status of household head					
	E2	Explain how long you have been in your current status in 1 above?					
	E3	How many other members from the household are employed?					
	E4	If your answer is unemployed, would you be willing to take a job if there is an opportunity?					
	E5	What is your estimated total household income per month inclusive of all sources? \$.....					
	E6	If not able to answer the above, in which category would you locate yourself (Monthly income)?					
		\$0-100 					
		\$101-300 					
		\$301-500 					
		\$501-1000 					
		\$1001-5000 					

E7	How long have you been earning this income for period 2010-2020? Years

E: B	ASSETS AND DURATION OF ASSET OWNERSHIP				
	Is the household in possession of the following assets and for how long between 2010-2020	Yes (0) For how long		No (1) For how long	
E8	House:		years		years
	house location: low density		years		years
	: medium density		years		years
	: high density		years		years
E9	Car/ vehicle		years		years
E10	Motor cycle/ Bicycle		years		years
E11	Radio		years		years
E12	Television		years		years
E13	Personal computer/ laptop		years		years
E14	Refrigerator		years		years
E15	Washing machine		years		years
E16	Microwave		years		years
E17	Stove		years		years
E18	Cellphone		years		years
E19	Bank Savings/ deposit		years		years
E20	Vacuum cleaner		years		years
E21	Insurance: Does the household have any insurance cover on durable assets it has Yes No				
E: C	Indicators; Land ownership, Empowerment programmes and Financial assistance				
E22	Land ownership	Does your household own land for agriculture or for other development projects? Yes No			
E23	If your answer is yes in 1 above explain	nature of activity on the land:	Period in possession (years)		
E24	Participation in community decision making	Does the household participate in any community decision making?	yes	no	
E25	If your answer is yes to 3 explain nature of decisions				
E26	Financial assistance	Do you receive any financial assistance from government or donors?	Yes No	Name of	
E27	If your answer is yes to 5 above specify the value per month				
E28	How long have you been receiving the assistance in question 5? years				
E29	If your household wanted to borrow money from a bank or other financial service provider (not including friends or relatives) would it be easy to borrow money?				

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province

	No (1)	Probably not (2)	Probably yes (3)	Definitely yes (4)	Don't know (5)		
E30	To whom is the majority of your debt owed?						
	1. Relatives		2. Friends		3. informal urban fund		
	4. local government		5. urban credit cooperative		6. Private money lender		
	7. Microfinance institution		8. Government bank		9. Private bank		
	10. Joint bank fund		11. Joint development project & bank fund		12. Other, specify:		
E31	Do some households in your area have fewer economic or political opportunities than others because of their religion or ethnic/minority group?						
	No (1)	Yes, a few households (2)	Yes, less than half of the households (3)				
	Yes, about half the households (4)		Yes, more than half the households (5)		Don't know (6)		
E32	If you answered yes to 9 above, tell us how has this situation (inequality) changed in the past 2 years?						
	Improved slightly (1)		Improved moderately (2)		Improved a lot (3)		
	Worsened slightly (4)		Worsened moderately (5)		Worsened a lot (6)		
	No significant change (7)		Don't know (8)		Other, specify: (9)		
F	DIMENSION ENVIRONMENT AND NEIGHBORHOOD QUALITY Indicators: infrastructure, pollution level, violence and crime.						
F1	Transport	What is the household's main mode of transport? family car (1) bus(2) taxi(3) bicycle(4) train (5) foot(6) Other: specify					
F2	What is the nature of your roads infrastructure?	Poor (1) good (2) better (3) very good (4)					
F3	What other government infrastructure do you enjoy within 1km from your household?						
F4	Pollution	Is your family subjected to pollution?	Yes	no			
F5	If your answer is yes to 4 above indicate the main cause(s)						
F6	How long have you been subjected to pollution you indicated in 4?						
F7	Crime: Did any household member(s) experienced crime (s) or violence (s) in the past year Yes No						
G	DIMENSION: LIVED AND CONSUMPTION POVERTY INDEX (Basic needs assessment) Indicators: quality of food, availability and affordability of basics						
G1	Over the past year, how often, if ever, have you and your family gone without:						
		Never during the last year	Just once or twice during the last year	Several times (once or twice monthly)	Many times (once weekly)	Always (on a daily basis)	Don't know
G2	Enough food to eat?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G3	Enough clean water for home?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G4	Medicines or medical treatment?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐

An investigation of circumstantial and durational urban poverty by developing a new multidimensional measure, the case of Harare province

G5	Electricity in your home?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G6	Enough fuel to cook your food?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G7	Enough monthly income?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G8	Decent housing accommodation (additional)?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G9	Decent clothing (additional)?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G10	Access to schooling, education or skills training (additional)?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G11	Access to clean environment	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G12	Financial assistance is enough for household?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
G13	close medical facility has enough medical supplies?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
H	POVERTY PERCEPTIONS: Poor people are poor because ... [probe for strength of opinion]. Mark with a Tick/X						
H2	They waste their money on inappropriate items.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H3	They do not actively seek to improve their lives.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H4	They are exploited by rich people.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H5	The society lacks social justice.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H6	Distribution of wealth in the society is uneven.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H7	They lack opportunities due to the fact that they live in poor families.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H8	They live in places where there are not many opportunities.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H9	They have bad fate.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H10	They have bad luck.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H11	They have encountered misfortunes.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H12	They are not motivated because of welfare.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H13	They are born inferior.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H14	Over the last 10 years, poverty in Harare has been increasing?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H15	And over the next 10 years, poverty in Harare will be higher than today?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H16	Poverty is inevitable and its part of life?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
H17	They lack insurance	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	
I	Household Circumstantial Food Insecurity Scale						
	(Rarely: once or twice; Sometimes: 3 to 10 times; Often: more than 10 times in the last four weeks). NB: All the questions apply to the last four weeks.						
I1	Did you worry that your household would not have enough food to eat? If answer is no, skip to Q2.					Yes0 ☐	No1 ☐
I2	How often did this happen?	Rarely:1 ☐		Sometimes: 2 ☐		Often: 3 ☐	
I3	Were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? If answer is no, skip to Q4.					Yes0 ☐	No 1 ☐

I4	How often did this happen?	Rarely:1 ☐	Sometimes:2 ☐	Often:3 ☐		
If your answer is yes to Qn I4: Do you expect to get the situation to improve in the next 6 months?						
I5	Did you or any household member have to eat a limited variety of foods due to a lack of resources? If answer is no, skip to Q16.	Yes:0 ☐	No:1 ☐			
I6	How often did this happen?	Rarely:1 ☐	Sometimes:2 ☐	Often:3 ☐		
I7	Did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food? If answer is no, skip to 18.	Yes: 0 ☐	No: 1 ☐			
I8	How often did this happen?	Rarely:1 ☐	Sometimes: 2 ☐	Often: 3 ☐		
I9	Did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food? If answer is no, skip to Q10.	Yes: 0 ☐	No: 1 ☐			
I10	How often did this happen?	Rarely:1 ☐	Sometimes:2 ☐	Often:3 ☐		
I11	Did you or any other household member have to eat fewer meals in a day because there was not enough food? If answer is no, skip to Q12	Yes:0 ☐	No:1 ☐			
I12	How often did this happen?	Rarely:1 ☐	Sometimes:2 ☐	Often:3 ☐		
I13	Was there ever no food of any kind to eat of in your household because of a lack of resources to obtain food? If answer is no, skip to Q13.	Yes:0 ☐	No:1 ☐			
I14	How often did this happen?	Rarely:1 ☐	Sometimes: 2 ☐	Often: ☐		
I15	Did you or any household member go to sleep at night hungry because there was not enough food? If answer is no, Skip to Q16.	Yes: 0 ☐	No: 1 ☐			
I16	How often did it happen?	Rarely: 1 ☐	Sometimes: 2 ☐	Often: 3 ☐		
I17	Did you or any household member go a whole day and night without eating anything because there was not enough food?	Yes: 0 ☐	No: ☐			
I18	How often did this happen?	Rarely: ☐	Sometimes: 2 ☐	Often:3 ☐		
I19	Have you adopted any of the following means for survival?					
		Daily	3-6 days per week	1-2 days per week	Not more than once per week	Never
I20	Rely on less expensive commodities	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I21	Purchase food on credit	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I22	Skip meals	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I23	Limited portion at meal times	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I24	Buy necessities	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I25	Stick to budget	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I26	Maintain food garden	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I27	Borrowed food, or rely on help from friends	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I28	Sent household members to eat elsewhere	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I29	Restricted adults from eating in order for smaller children to eat	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

I30	Sent household members to beg	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I31	Gathered wild vegetables	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I32	Defaulted on loans/ mortgages repayments					
I33	Other (Describe)					

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