

A multidimensional analysis of poverty in a former South African Homeland

By

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Submitted in accordance with the requirements for the degree

PHILOSOPHIAE DOCTOR

In

ECONOMICS

at the

NORTH-WEST UNIVERSITY (VAAL TRIANGLE CAMPUS)

Promoter: Dr. D.J. Viljoen

April, 2016

DECLARATION

I declare that

A multidimensional analysis of poverty in a former South African Homeland

is my own work and that all the resources used or quoted have been duly acknowledged by means of complete references and that I have not previously, in its entirety or in part, submitted it for obtaining any qualification at any other university.

Rachel Nishimwe-Niyimbanira

ACKNOWLEDGEMENTS

I am very thankful to the Lord my God for the grace that has sustained me this far in my studies for without them, I would have accomplished nothing. My sincere gratitude goes to my husband, Ferdinand Niyimbanira, for the love, support and unwavering encouragement. I would also like to extend warm thanks to my son, Ineza Ian Niyimbanira, for his patience, when I could not attend to his needs. I owe everything to them.

My sincere appreciation is due to many people who helped to bring this research project to fruition. I am grateful to my promoter, Dr. D.J. Viljoen, for her valuable guidance throughout this study. In addition, to Dr. T.J. Sekhampu, for his guidance and inspiring suggestions during the initial stages of the study.

I am very grateful to all people I have met during my stay at North-West University who have contributed to the development of my research. In particular, I would like to express my gratitude to the School of Economics, especially the economics group members, for their numerous interactive episodes, constructive suggestions and help. I am also grateful for the research funding from the North-West University which allowed me to pursue this study without financial hurdles.

Last, but not the least, I would like to thank my parents, brothers and sisters and many friends, for always believing in me, their continuous moral and spiritual support throughout my life. I am forever grateful.

ABSTRACT

The study involved a multidimensional analysis of poverty in the former South African homeland of Qwaqwa. It was carried out by determining various dimensions of poverty in which the residents of the area are deprived. Seven dimensions of deprivation, constructed from 18 indicators, were identified. These dimensions include education (educational achievement and literacy), housing and clothing (floor material, walls material, roof material and condition, rooms and clothing), water and sanitation (sources of water and sanitation type), assets, (TV or radio, cell phone or landline telephone and other assets) air quality (fuel for lighting, cooking and heating), income and health (proximity to health facilities and food security). The dimensions in the study are equally weighted.

The analysis was achieved through a number of theoretical and empirical objectives. The theoretical objectives of the study were related to poverty theories, which included the analysis of unidimensional and multidimensional approaches, as well as a review of previous studies in South Africa, with special attention to the former South African homelands, including Qwaqwa, from which the study's data was collected. In general, the former South African homelands have been characterised as having poor infrastructural development and welfare services, coupled with high levels of poverty, which have resulted in very low standards of living compared to most parts of South Africa. The study considers the historical nature and the poverty dynamics of these areas in providing a comprehensive point of departure to understand the multidimensional nature of poverty, based on Alkire and Foster's family of measures.

Empirically, the study has determined various deprivations and their levels, as defined by union (deprived in one or more indicators), intersection (deprived in all dimensions) and the dual cut-off (cut-off between union and intersection criteria) method of identification. It is important to note that the identification study is mostly built upon Alkire and Foster's dual cut-off method of identification. The aggregate deprivation by dimension represented by the approximate headcount in each indicator of seven dimensions used in the study indicated that the former homeland

is more deprived than the whole of South Africa in almost all dimensions, regularly by a wide margin. By identifying the poor, any poverty index based on the intersection approach would judge the former homeland of Qwaqwa as almost poverty free (0.002%) while 100% of all households would live in poverty if identification of the poor is established on the union approach. However, this study considered a k -threshold ($k=33\%$) which is very similar to the k threshold chosen by other researchers in similar frameworks. At $k=33\%$ of all indicators, about 61% of the households are deprived in 53.4% of total dimensions, on average, with the intensity of poverty M_0 being 0.32. The study has analysed the poverty dimension through a breakdown of their intensity, in order to establish their specific contribution to overall poverty. Given the cut-off $k=33\%$, health, most importantly, is the highest contributor to the breadth of poverty (19.06%), followed by water and sanitation (18.46%), education (15.80%), income (15.10%), housing and clothing (14.16%), air quality (12.53%) and assets (4.89%).

The study established different levels of poverty by comparing income poverty to multidimensional poverty measures. Multidimensional poverty estimates showed higher estimates of poor, with 61%, compared to 40% of households which fall below the income poverty line. The analysis showed that the use of the income measure is bound to underestimate the level of poverty in an area. For example, a certain number of the households, identified non-poor by income, were discovered to have even 11 and 12 deprivations out of a total of 18 dimensions, thus showing the limitation of the monetary measure of poverty. Based on the Spearman correlation, the relationship between the level of income of the household, and the number of deprivations associated with it, indicated a lack of overlap between the group of poor acknowledged by the monetary measure and the group of the poor detected by the multidimensional approach. All pairs were not correlated, and even the income deprivation is not correlated with all other aspects of deprivation, while it is claimed to be the measure of poverty that reflects deprivation in other dimensions. This emphasises the arguments this study is built on, that deprivation in one dimension does not satisfactorily justify the deprivation in any other dimension.

The study utilised the aggregate measures of poverty suggested by Alkire and Foster in estimating the change in level of deprivation in Qwaqwa, thus establishing the depth and level of inequality in the area. The study performed poverty decomposition, using sub-groups within the area, by examining villages and household characteristics. Concerning the depth and inequality among the poor, the study considered the multidimensional poverty gap M_1 and multidimensional squared poverty gap M_2 for the analysis. The study found that with respective cut-offs there are large poverty gaps and high inequality among deprived states of the poor.

Based on the subgroup decomposability property of Alkire and Foster's poverty measures, the analysis of poverty in eight villages within Qwaqwa was undertaken according to household size. At $k=33\%$ cut-off, the highest multidimensional headcount ratio and intensity of poverty was found in Boitekong followed by Kudumane, Mabilela, Qholahoe, Mphatlalatsane, Matsikeng, Ntsehele and Bochabela villages. The study established the robustness of cut-off variations which provides village ranking in terms of areas that are worse off than others. It was confirmed that Kudumane and Boitekong are dominated by other villages both in poverty headcount ratio and intensity of poverty. Combining the inequality and robustness, the study has established that the villages with the highest multidimensional intensity of poverty M_0 and multidimensional poverty gap M_1 have the highest estimates of multidimensional squared poverty gap M_2 . This implies that, in those villages, the multidimensionally poor households are far from ceasing to be so and their state is accompanied by high inequality. This pattern was also found when the robustness of village rankings to changes in the poverty cut-off k was used.

By exploring the multidimensional poverty based on the former homeland of Qwaqwa, using the Alkire and Foster family of poverty measures, the study provides a shift in attention from solely income measures to include other intrinsically important dimensions when analysing poverty. By using the survey data, the study identified the share of poverty in terms of dimensions that hold the highest share of poverty. The study has, in general, provided an analysis of, and insights into, the broader perspective of multidimensional poverty as a necessary shift from the traditional unidimensional perspective of poverty, which basically centres on income.

Through the breakdown of dimensions and subgroup decomposability of poverty measures used, the study has provided a methodology which not only produces meaningful results, but can also potentially provide useful tools for budget allocation among areas and within a region, by applying, among other things, the use of different dimensions. It should, however, be noted that the dimensions used in the study are not exhaustive and other dimensions could also be incorporated, subsequently leading to alternative deprivation cut-off values for respective analysis.

The case of Qwaqwa has demonstrated a classical example of the need to clearly specify the setting area developmental goals on the basis of holistic understanding of households challenges and, in this case, poverty status and levels, if meaningful development is to be achieved. Such an in-depth understanding in setting developmental goals has been enriched from the proposed methodology of the study and can be used as a progress-monitoring instrument. This analysis is particularly relevant in connection to South Africa's bold adoption of the poverty-related Millennium Development Goals (MDGs), keeping in mind the spatial legacy of apartheid. The formulation of effective interventions to combat poverty requires a clear grasp of its manifestations in a particular area. The study's special contribution is hence on poverty analysis methodology, as guided by the multidimensional poverty measure, which goes beyond the identification of geographical deprivation by setting a threshold level in order to define who the multidimensional poor are, the degree of the deprivations and the nature of their challenges. On the basis of evidence established in this study, five areas of policy adaptation have been recommended. They are the adoption of Alkire and Foster's methodology in identifying the needs of poor household, the prioritisation of the needs/dimensions, prioritisation of target area, the household targeting as determined by the household size, the involvement of local leaders and a suggested model for identifying needs, both at the macro and micro level.

Keywords: Multidimensional poverty, Millennium Development Goals (MDGs), income poverty, former South African Homeland, Alkire and Foster methodology.

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LIST OF ABBREVIATIONS

AMPS:	All Media and Products Surveys
ANC:	African National Congress
ASGISA:	The Accelerated and Shared Growth Initiative for South Africa
BRICS:	Brazil, Russia, India, China and South Africa
FGT:	Foster, Greer and Thorbecke
GEAR:	Growth, Employment and Redistribution
GHSS:	General Household Surveys
HDI:	Human Development Index
HDR:	Human Development Report
HFIAP:	Household Food Insecurity Access Prevalence
HFIAS:	Household Food Insecurity Access Scale
HPI:	Human Poverty Index
HSRC:	Human Sciences Research Council
IAI:	Identification, Adaptation and Implementation
ICSU:	International Council for Science
IDP:	Integrated Development Plan
IES:	Income and Expenditure Survey
IFAD:	International Fund for Agricultural Development
ILO:	International Labour Organization
IMF:	International Monetary Fund
IMMDG:	Indicators for Monitoring the Millennium Development Goals
ISRDP:	Integrated, Sustainable Rural Development Programme
ISSC:	International Social Science Council
JIPSA:	Joint Initiative on Priority Skills Acquisition

KIDS:	KwaZulu-Natal Income Dynamics Study
LCS:	Living Conditions Survey
LED:	Local Economic Development
LPG:	Liquefied Petroleum Gas
LPI:	Lived Poverty Index
MDGs:	Millennium Development Goals
MPI:	Multidimensional Poverty Index
NDA:	National Development Agency
NDP:	National Development Plan
NGOs:	Non-Governmental Organisations
NGP:	New Growth Path
NIDS:	National Income Dynamics Study
OECD:	Organization for Economic Co-operation and Development
OHS:	October Household Survey
OHSs:	October Household Surveys
OPHI:	Oxford Poverty and Human Development Initiative
PCA:	Principal Component Analysis
PIMD:	Provincial Indices of Multiple Deprivation
PIR:	Poverty and Inequality Report
PPP:	Purchasing Power Parity
PRSP:	Poverty Reduction Strategy Papers
PSDF:	Provincial Spatial Development Framework
PSLSD:	Project for Statistics on Living Standards and Development
RDP:	Reconstruction and Development Programme
SAIMD:	South African Index of Multiple Deprivation
SALDRU:	Southern African Labour and Development Research Unit

SA-PPA:	South African Participatory Poverty Assessment
SDGs:	Sustainable Development Goals
SDI:	Service Deprivation Index
SID:	Single Indicator of Deprivation
SPII:	Studies in Poverty and Inequality Institute
StatsSA:	Statistics South Africa
TFR:	Totally Fuzzy and Relative
UN:	United Nations
UNDG:	United Nations Development Group
UNDP:	United Nations Development Programme
URP:	Urban Renewal Programme
USA:	United States of America
USAID:	United States Agency for International Development
VIP:	Ventilated Improvement Pit toilets
WHO:	World Health Organization

CHAPTER 1: THE PROBLEM AND ITS SETTING

1.1 INTRODUCTION

Poverty continues to be a lingering problem faced by many countries of the world, mostly developing countries. Poverty reduction programmes remain the main preoccupation of economic policies. To be able to understand problems which are caused by poverty, one needs to understand its definitions, concepts, measurement and the areas in which it appears to be deepened (Bourguignon & Chakravarty, 2003:25). As people define poverty differently, elucidation of how it is defined is vital, because different definitions of poverty involve the use of different indicators for measurement. These indicators may lead to the recognition of different individuals and groups as poor and require different policy implications for poverty alleviation (Laderchi *et al.*, 2003:2).

The literature on the concept and measurement of poverty has significantly improved from the traditional unidimensional analysis of poverty (poverty was seen as a lack of either income or expenditure) to the multidimensional concept of poverty and well-being (Alkire & Foster, 2011b; Clark & Hulme, 2005; Thorbecke, 2005:1). The current discourse sees poverty as a multifaceted phenomenon requiring different approaches and methodologies informing its understanding. Inadequate consumption and poor living standards remain in the mind of what many people identify as the meaning of the word “poverty”. However, poverty is seen to be about more than just low incomes. South Africa is one of those countries faced with the challenge of poverty, mainly relating to the previous discriminatory policies of apartheid.

The post-apartheid government of the African National Congress (ANC) in South Africa noted “it is not merely the lack of income which determines poverty. An enormous proportion of very basic needs are presently unmet” (ANC, 1994). This led to their drafting of the Reconstruction and Development Programme (RDP) after being democratically elected in 1994. The RDP aimed to set South Africa firmly on the road to eliminating hunger, providing land and housing, access to safe water and

sanitation, ensuring the availability of affordable and sustainable energy sources, eliminating illiteracy, raising the quality of education and training for children and adults, protecting the environment and improving health services and making them accessible to all (ANC, 1994). This and other policies such as the Growth, Employment and Redistribution (GEAR), and the National Development Plan (NDP) show that South African policy-makers view poverty as a multidimensional phenomenon.

On a global scale, 189 global leaders inaugurated the launch of the new millennium by adopting the UN Millennium Declaration, in September 2000. This declaration was translated into a roadmap setting out eight goals (Millennium Development Goals or MDGs), to be achieved by 2015 (WHO, 2010:58). The MDGs emphasise eight interrelated features of human suffering and achievement, which have created the basis of campaigns that are in progress in numerous countries. Fighting extreme poverty and improving health and education are among the most important MDGs (UN, 2012:4). To effectively reach these targets, the importance of research in bringing about the global understanding of the problem of poverty can never be understated. The adoption of the MDGs was a reaffirming of the understanding that dealing with global problems requires multiple responses to a multidimensional problem.

By identifying the predominant aspects of poverty, the multidimensional approach presents basic information for the design and implementation of socioeconomic policies to diminish the incidence and intensity of poverty. The research literature (Alkire & Santos, 2010; Appiah-Kubi *et al.*, 2007) identifies multidimensional analysis of poverty as the future of understanding the socioeconomic dynamics of underprivileged communities in parts of the developing world. Considering poverty as a multiple deprivation therefore enhances the explanatory power of social sciences in research. The multidimensional poverty analysis looks beyond preceding international measures of poverty to identify the poorest people and the aspects in which they are deprived (Alkire & Santos, 2010:7). Explicitly, it identifies deprivations which comprise poverty and those that are most frequent among diverse groups, so that policies can be drawn to respond to these particular deprivations. Such

information is very important to efficiently allocate resources where they are likely to be most needed.

Poverty is a multidimensional phenomenon because it varies in scale and context (political, social, cultural, historical, economic and ecological). An example is the difference between urban and rural poverty, where the rural poor are found to experience poverty in different ways from those in urban areas (Neves & du Toit, 2013:93). In most countries, the incidence of poverty is higher in rural areas than urban and the rural poor are far worse off than the urban poor in terms of conditions of living (food security, assets, economic opportunities, education, health care, clean water, sanitation, communication and transport) (IFAD, 2011:16-17; Khan, 2000:6). Khan (2000:6) explained that urban poverty is mostly rooted in the fact that rural poor move from rural areas to the city expecting a better life. In general, the population of the developing world is still more rural than urban. Some 55% of the total global population live in rural areas and, among them, 70% are very poor (IFAD, 2011:16). In the South African context, findings based on the Income and Expenditure Survey (IES 2005/2006, LCS 2008/2009 and IES 2010/2011) indicated that households residing in urban areas had increased from 65.1% to 67.3% by 2011 (StatsSA, 2014a:46).

The incidence of poverty was consistently found to be much higher in the rural areas than in the urban areas of South Africa (StatsSA, 2014a:33, 46). In 2006, the poverty rates of households and individuals in the rural areas were 67.5% and 80.8%, respectively, more than double the corresponding rates for urban areas (28.7% and 40.7%, respectively). By 2011, the percentages of poor households and individuals in urban areas were 22.0% and 30.9%, respectively, while 55.2% of households and 68.8% of the population in rural areas were poor. The area of study, Qwaqwa, a former 'homeland', falls into two categories: so-called 'closer settlement' villages (distinguished by their poor amenities and urban-sized residential plots) and a proclaimed town, Phuthaditjhaba (Bank, 1984:2). The area includes urban settlements and also the rural areas located on tribal land. In spite of the mixed nature of the area, being both urban and rural, the study's analysis is biased towards the rural areas of Qwaqwa, which have predominantly high levels of poverty.

1.2 PROBLEM STATEMENT

Poverty or economic well-being is recognised as a multidimensional problem. Its traditional measures have been based on the net monetary income of a household unit or on its consumption (Alkire & Sarwar, 2009:4; Iceland, 2003; Wagle, 2006; Weinberg, 1996). Monetary measures identify poverty with a shortfall in consumption (or income) from some poverty line. Income or consumption of different components is valued at market prices and this requires identification of the relevant market and the imputation of monetary values to those items that are not valued through the market (Laderchi *et al.*, 2006:10). Income poverty measures have been commonly used to analyse poverty in developing countries, including those of Sub-Saharan Africa.

Some arguments suggest going beyond monetary measures and considering other poverty measurements (Hulme & McKay, 2006). Thanks to the seminal works of Sen (1976; 1985; 1992; 1995) and others (Anand & Sen, 1997; Townsend, 1979; 1987; UN, 1995), the understanding of poverty has been reshaped as a problem which requires a multi-pronged approach. More advanced analyses of poverty reveals that money-metric measures have a limited ability to adequately identify, describe and analyse the nature of the meaning of being poor, as well as the imperfection in the initial assumptions concerning human preferences and behaviour. The criticism which has marked the writings of Sen (2000:3) emphasised that, when doing poverty assessments, “we must look at impoverished lives and not just at depleted wallets”. Lu (2012:4) and Fusco (2003:2) added that monetary measurements of poverty often produce short-term results instead of long-term and sustainable results. Saith (2004:26) and Guest (2007:3) felt that income-based approaches appear to be too narrow to match reality, because they ignore other types of welfare and social relations. The suggested way of correcting all the aforementioned shortfalls is to develop a realistic way of understanding the concept of well-being.

Poverty research has widened its breadth and depth, so that well-being and poverty are now perceived as a multidimensional phenomenon. The well-being of an individual depends therefore not only on income, but also on various capabilities or

other dimensions, including health, education and empowerment. The well-being of a population and its poverty, which is a manifestation of insufficient well-being, depend on monetary and non-monetary variables (Anand & Sen, 1997; Bourguignon & Chakravarty, 2003:3; Cherkaoui *et al.*, 2009:12). It can be expected that a person with a reasonable consumption budget or higher income may be able to enhance the position of a number of monetary and non-monetary attributes. Firstly, some essential needs (non-monetary attributes) may not be met, because markets might not exist. It may happen with some public goods, or when markets operate very imperfectly. These are the cases where the availability of some attributes has to be provided by institutions. For instance, in most situations it is the state or non-governmental organisations (NGOs) which provide clean water, electricity and education.

Secondly, for every household, the capacity of converting income into *functionings* (*beings* and *doings*) is different, since the way various households behave is not identical. At this point the rising challenge is the ability to convert income into resources. This challenge is explained by examples given by Alkire and Santos (2013:239). In households in rural areas, people have to travel further to get to the markets and public services. Disabled people and households whose members have a very low educational attainment, or with high-interest loans, might not be able to afford the same basket of goods and services that, in theory, they were supposed to afford with the income they have (Alkire & Santos, 2013a:239). Even if equal resources are available, the level of capabilities and *functionings* provided by those resources differ across diverse people. For instance, a similar caloric bundle will yield distinct nutritional outputs across a sedentary office worker, a labourer with a high metabolism, a pregnant woman or an elderly person. Thorbecke (2005:5) noted many examples of household heads who earn an income above the poverty line and mainly allocate their income to satisfy wants for, say, alcohol and tobacco, instead of allocating it to a basic food basket in order to satisfy their children's minimum calorific requirements. In the analysis based on monetary approaches, such households would be categorized as non-poor, while some of their members, in

reality, are deprived of certain basic necessities and thus should be considered poor. This demonstrates that wants and basic needs differ.

A further understanding of challenges in poverty analysis is more amplified by participatory inquiry and research practice to poverty shows that poor individuals themselves describe their condition of deprivation using a series of dimensions. These include health, low education, nutrition, social exclusion, lack of adequate sanitation and water, bad housing conditions, shame, violence and disempowerment (Alkire & Santos, 2013a:240). In brief, it seems to be inappropriate to consider income as the only indicator of well-being, without adding other variables such as literacy, housing, provision of public goods and life expectancy. Globally, and in the South African context, there is still a need for measuring poverty in its multidimensional nature. This study has addressed this problem by giving a more complete image of poverty in the former South African homeland of Qwaqwa.

1.3 A BRIEF PROFILE OF FORMER SOUTH AFRICAN HOMELANDS

The 'homelands' were established under the Bantu Authorities Act of 1951 and were established for black African groups that numbered approximately 20 million until they were reincorporated into South Africa in 1994 South Africans. This number represented almost 50% of the African population (Mariotti, 2012:4). There were 10 homelands that were established, namely Transkei, Bophuthatswana, Ciskei, Venda, Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa and Qwaqwa. In terms of land area, homelands occupied approximately 122.1 million hectares, which represented 13.96% of the total area of South Africa (Pienaar & Von Fintel, 2013:9). In terms of land quality, most homelands were not only geographically fragmented, with poor infrastructure, but also had poor land quality, not suitable for agriculture, due to their mountainous nature and poor rainfall. Most homelands could not offer a variety of employment opportunities, as they contained very few towns and, in some cases, no cities at all. The social and economic conditions within the black homelands were exceptionally harsh, by any standards. In general, there was poor infrastructure development and welfare services, coupled with high levels of poverty, which meant the homelands had a very low standard of living, compared to most

parts of South Africa. The study considered both the historical nature and the poverty dynamics of these areas in providing a comprehensive base to understand the multidimensional nature of their poverty.

1.4 SURVEY AREA: QWAQWA

The Qwaqwa Bantustan was the official homeland of the “South Sotho ethnic national unit”. It was the smallest of the South African homelands, but the most densely settled in South Africa (Bank, 1984:2). Qwaqwa is still the most densely populated area in the Eastern Free State region and provides a home for almost 25% of the total population of the Free State (Department of Water Affairs, 2011:9). In 1982, the settlement patterns within Qwaqwa were falling into two categories, the so called ‘closer settlement’ villages (distinguished by their poor amenities and urban sized residential plots) and a proclaimed town, Phuthaditjhaba (Bank, 1984:2). Nowadays, Qwaqwa includes the urban settlement and rural areas located on tribal land.

Qwaqwa is in the Maluti-A-Phofung Local Municipality of Thabo Mofutsanyana District Municipality in the Free State province of South Africa. Phuthaditjhaba is the urban centre of Qwaqwa and serves as the administrative head office of Maluti-A-Phofung municipality. Surrounding Phuthaditjhaba are the rural villages of Qwaqwa, established on tribal land administered by the Department of Land Affairs. Those villages include Kudumane, Boitekong, Mphatlalatsane, Maboletla, Ntshhele, Qholahoe, Bochabela and Matsikeng village. The urban area of Qwaqwa (Phuthaditjhaba) is located about 45 kilometres south west of Harrismith along the R712. The estimated population size of Phuthaditjhaba is 54 661 people and 17 529 households (735.65 per km²). The sandstone hills of the Drakensberg mountain peaks surrounding Phuthaditjhaba led the San (Bushmen) to name the area Qwaqwa (whiter than white) (Department of Water Affairs, 2011:9). It used to be known as Witsieshoek (after the name of a farm) (Department of Water Affairs, 2011:9). The majority of Qwaqwa residents are impoverished and life is an everyday struggle (Dreamcatcher, 2013). In general, the socioeconomic situation of the area appears to be poor and there is the economic activity (Department of Water Affairs,

2011:9). There is a migrant labour system, in which household heads leave Qwaqwa to work in mining areas in order to support their families, only to return on leave and on holidays (Department of Water Affairs, 2011:9). The rural areas have very rudimentary infrastructure and the majority of inhabitants depend on subsistence agriculture and backyard gardening. Only 40% of the inhabitants of the Maluti-A-Phofung Local Municipality are earning a salary (Maluti-A-Phofung, 2014:26).

The present research done in the Maluti-A-Phofung Local Municipality shows that its multiple deprivation score was very low, as six out of 10 most deprived wards in Free State province were located there (The South African LED Network, 2006). The Census 2011 Municipal factsheet shows that only 30.3% of the households in Maluti-A-Phofung had a flushing toilet connected to the sewerage, 31.9% had piped water inside their dwelling and 89% have access to electricity for lighting (StatsSA, 2012b:41). In the Maluti-A-Phofung Local Municipality the population aged above 20 years without formal education was 8.9%, while those with a matric exemption was 26.80% and 7.90% had higher education (StatsSA, 2012b:17). Maluti-A-Phofung's unemployment rate (64%) is high compared to the rest of the Free State (32.6%) (StatsSA, 2012b:17).

Given that Qwaqwa has a low level of economic activity. This means that high levels of unemployment and a poor socioeconomic situation exists, to the point that life is a contestant struggle. Seeing that very little work has been done hitherto by way of analysing poverty and multidimensional poverty, particularly in the former homeland of Qwaqwa, it is important to conduct a study using various measures of poverty to detect predominant aspects of deprivation and other factors which may affect the poverty status of its population, in the light of future policies. Homelands remained predominantly underdeveloped and poor. As a result, people that were able to leave the former homeland for urban areas did so. Those who stayed behind continue to live in conditions of underdevelopment, low employment and limited infrastructure (Pienaar & Von Fintel, 2013:1).

1.5 IMPORTANCE OF THE STUDY

In South Africa, approximately 46% of the population is said to be living below the poverty line (StatsSA, 2014a:12). Most of the previous research in South Africa has focused on income/expenditure poverty (Armstrong *et al.*, 2008; Carter & May, 1999; Leibbrandt *et al.*, 2000, May *et al.*, 1998) and few studies have been done in the former homelands. The present study focused particularly on the levels of deprivation in the former homeland of Qwaqwa, as there is a gap concerning identification and quantification of the multidimensional nature of poverty in former South African homelands.

In its report, StatsSA (2000) noted that poverty needs to be analysed broadly beyond income: “It is seen as the denial of opportunities and choices most basic to human development to lead a long, healthy, creative life and to enjoy a decent standard of living, freedom, dignity, self-esteem and respect from others” (StatsSA, 2000:54). Apart from the UNDP’s human development index (HDI) some attempts at going beyond the conventional unidimensional monetary approach to poverty measurement have been made in order to construct indices of multiple deprivations in South Africa (Hirschowitz *et al.*, 2000; Klasen, 1997; 2000; Mattes *et al.*, 2002; McIntyre *et al.*, 2000; 2002; Vichi, 1997). These indices tend to be empirically driven and lack a strong theoretical underpinning relating to multiple deprivations and a coherent methodological approach (Alkire & Sarwar, 2009:22; Noble *et al.*, 2006:9-11; Noble & Wright, 2012:3). In recent years there have been Provincial Indices of Multiple Deprivation for South Africa (PIMD) and the South African Index of Multiple Deprivation (SAIMD), which have entered the national debate (Noble *et al.*, 2006; Noble *et al.*, 2010). PIMD provided information about relative levels of deprivation within the provinces, but did not allow comparison among provinces. SAIMD followed PIMD to produce a more fine-grained profile of deprivation in South Africa, which allows comparisons.

The multidimensional poverty measure which is used in this study (Alkire and Foster methodology) goes beyond the identification of geographical deprivation (as in PIMD and SAIMD) by setting a threshold level in order to define who the multidimensional

poor are, the degree of their deprivation and the nature of their problems. There are several advantages in using this methodology, as identified by Alkire and Seth (2009), as it can be justified at theoretical level and on ethical soundness, and can be easily understood by the general public and policy-makers. The methodology identifies the intensity, depth and severity of poverty and satisfies a number of preferable properties of a poverty measure. The methodology distinctively estimates the multidimensional poverty and identifies the poor households. Firstly the methodology provides a valid treatment when using the ordinal/categorical data and secondly, it treats the dimensions of poverty and deprivation independently of other dimensions without assuming substitutability across dimensions. Thirdly, the methodology is flexible in terms of assigning equal or different weights to other dimensions according to their relative importance. The Alkire and Foster methodology, by increasing the aggregate cut-off point, becomes a strong tool in isolating the poorest of the poor from just the poor. The methodology is highly useful for policy orientation, as it provides more information on the dimensions which are behind the multidimensional poverty when comparing certain regions or groups of households and can provide a basis for proper social protection mechanisms for households. For example, which household falling under the poverty line and deprived in health dimension would require health insurance? This study fills the gap left by the aforementioned measures and the traditional unidimensional measures of poverty in a former South African homeland.

1.6 OBJECTIVES OF THE STUDY

The following objectives have been formulated for the study:

1.6.1 Primary objectives

The primary purpose of this research was to conduct a multidimensional analysis of poverty in the former South African homeland of Qwaqwa. The study determined various dimensions in which residents of the area are deprived.

1.6.2 Theoretical objectives

In order to achieve the primary objective, the following theoretical objectives were formulated for the study:

- Conduct a literature review on poverty theories in general;
- Review the literature on multidimensional poverty theories;
- Conduct a review on the empirical studies on determinants of multidimensional poverty, compared to the monetary approach;
- Review the literature on attempts to measure multidimensional poverty in South Africa;
- Review the empirical studies on the analysis of multidimensional poverty in South Africa; and
- Conduct a literature review of poverty research in the former South African homelands.

1.6.3 Empirical objectives

In accordance with the primary objective of the study, the following empirical objectives are formulated:

- To determine the level of various deprivations suffered by the population in the former South African homeland of Qwaqwa:
 - Determine the extent of deprivation in Qwaqwa, using the three different approaches of identification, namely union, intersection and dual cut-off methods of identification;
 - Analyse the intensity of the poverty dimension through a breakdown of its contribution to the overall poverty; and
 - Compare the results of multidimensional approach with the monetary approach to poverty.
- To estimate the change in level of deprivation using aggregate measures of Alkire and Foster methodology in Qwaqwa:
 - Consider poverty decomposition using sub-groups within the area, in this case of village and household size; and

- Check the robustness of village ranking according to the cut-off variations.

1.7 RESEARCH DESIGN AND METHODOLOGY

A sample of 404 households was randomly selected to meet the analytical needs of this study. A similar sample size was analysed by Case and Deaton (2009) and Sekhampu and Dubihlela (2012) in a similar field of study. In order to collect the necessary data, a survey by questionnaire was undertaken. Structured face-to-face interviews with participants in their own households were carried out. The target population are households based in Qwaqwa, a semi-rural township in South Africa. Households in which the questionnaires were administered were randomly pre-selected from a map of the area. The data collected were analysed using descriptive statistics (frequency distribution, percentages and mean) and the Spearman correlation.

1.7.1 Measuring instrument

A number of methods of aggregation have been recommended to measure multidimensional poverty. The analysis of multidimensional poverty has seen a growing body of innovations on how best the multidimensional nature of poverty could be extrapolated, except for a void of a broad consensus for practical application. The most commonly used methods can be grouped into axiomatic and information theory approaches (Alkire & Foster, 2011b; Bourguignon & Chakravarty, 2003; Chakravarty & Silber, 2008; Chakravarty *et al.*, 1998; Maasoumi & Lugo, 2008; Tsui, 2002), fuzzy set theory (Betti & Verma, 2004; Cheli *et al.*, 1994; Cheli & Lemmi, 1995; Chiappero-Martinetti, 2006; Cerioli & Zani, 1990; Dagum, 2002; Lemmi & Betti, 2006), the information theory approach (Deutsch & Silber, 2005; Maasoumi & Lugo, 2006; Miceli, 1997; Naidoo, 2007) and distance function approach (Coelli *et al.*, 1998; Lovell *et al.*, 1994)). In this study, the Alkire and Foster methodology, which allows for multiple ways to measure deprivations, will be used. This methodology falls into the category of axiomatic approaches and follows the two steps of a poverty measurement (identification and aggregation), suggested by Sen (1976:219). The axiomatic approach to the measurement of poverty sets out the axioms (a set of

desirable and ethically defensible properties) against which a poverty index should be judged (Xu & Osberg, 2001:155). Under this subsection, the identification and aggregation steps of the Alkire and Foster measure will to be discussed and the model which will be used to reveal the determinants of multidimensional poverty will be explained.

1.7.1.1 Identification

Alkire and Foster (2011b) devised what they call a “dual cut-off” method of identification of the poor. This method follows two stages as indicated by its name. Firstly, given a population of n individuals, a set of d dimensions, and a cut-off value for each dimension z_j ($j=1,...,d$), identify those dimensions in which each individual is deprived. In other words, for each dimension there is a specific poverty line z_j in order to identify the individuals deprived in that particular dimension. Secondly, suppose that $k=1,...,d$ considered dimensions (e.g. education, health, income, etc.), and that c_i stands for the number of dimensions in which person $i=1, ..., n$ is deprived, then person i is regarded as multidimensionally poor if $c_i \geq k$. One then counts the number of deprivations for each individual and categorises as multidimensionally poor those whose number of deprivations equals or exceeds a defined threshold value (k) (k would represent that number of dimensions for cut-off, above which a household would be regarded as poor; these would be beyond income).

There is another decision to be made in multidimensional context: among those who fall below the threshold in some dimension(s). Who should be regarded as multidimensionally poor? To define the aforementioned second cut-off k , the Alkire and Foster method of identification is based on two fundamental approaches to the identification of the poor. Firstly, there is a *union* approach, which considers a person as multidimensionally poor if that person falls short in only one dimension ($k=1$) (Atkinson, 2003:51). This method may be too inclusive and may overestimate poverty if the number of dimension d is large (Alkire & Foster, 2011b:478). As a result, a union method may not be useful to discern and target the most highly deprived. The second is the *intersection* approach, which considers an individual as

poor if they are poor in all dimensions ($k=d$) (Atkinson, 2003:51). This identification method is too strict and it generally generates low estimates of poverty, but is expected to detect the most indigent people. It certainly fails to notice individuals who are facing extensive, but not universal, deprivation (e.g. a healthy homeless person). This may conclude by considering a person who plainly suffers extensive multiple deprivations as non-poor. Bresson (2009:2) and Lugo and Maasoumi (2009:25) claimed that the *union* and *intersection* criteria for the identification of poverty appears to be too rigid for most cases. This shows a need for determining a different number of dimensions k (cut-off), in which someone is deprived or to be regarded as multidimensionally poor.

The second cut-off recommended by Alkire and Foster (2011b) involves the *union* and *intersection* criteria, but also allows an intermediate situation. In other words, the identification point lies somewhere in the middle, between the two extremes. The Alkire and Foster measure involves selecting the second cut-off k to be any value between one (the *union* approach $k=1$) and the maximum number of dimensions d (the *intersection* approach $k=d$). Therefore, individual i suffering c_i number of deprivations is considered as multidimensionally poor if $c_i \geq k$. The Alkire and Foster methodology is flexible to assign equal or various weights to different dimensions, depending upon their relative importance.

1.7.1.2 Aggregation

In the aggregation stage, Alkire and Foster (2011b) extended the contemporary unidimensional methodology of measuring well-being and poverty proposed by Foster-Greer-Thorbecke (1984), sometimes referred to as the FGT measure. Similar to the FGT measures, the Alkire and Foster measure is a family of three key measures, appropriately adjusted to account for the multidimensionality of poverty (Alkire & Foster, 2011b). An appropriate measure of poverty has to comply with some valuable properties. The Alkire and Foster measures satisfy a range of desirable properties, including decomposability, symmetry, weak transfer, monotonicity, weak monotonicity, poverty focus, deprivation focus and replication invariance (Alkire & Foster, 2011b). The three members of the Alkire and Foster

family of measures (M_a) are adjusted head count M_0 , adjusted poverty gap M_1 and adjusted squared poverty gap M_2 .

The adjusted head count M_0 indicates not only the incidence (headcount ratio) but also the intensity of poverty (breadth of poverty) (Alkire & Foster, 2011b:479; Alkire & Santos, 2013a:244; Alkire & Seth, 2009:12). The headcount ratio of multidimensional poverty H is defined as the percentage of the population who have been identified as multidimensionally poor, while the intensity of poverty is defined as the average deprivation share A across the poor. The intensity of poverty reflects the fraction of the dimensions in which the average multidimensionally poor person is deprived. Therefore $M_0 = H * A$.

The adjusted poverty gap M_1 indicates the incidence, breadth and depth of poverty (Alkire & Foster, 2011b:479; Alkire & Santos, 2013a:245; Alkire & Seth, 2009:13). The depth of poverty is defined as the weighted average of dimension-specific poverty gaps. Simply, it is the gap G between poverty and the poverty line. It is the product of H , A , and the average poverty gap among the poor G : $M_1 = H * A * G$.

The adjusted squared poverty gap M_2 reflects the severity of poverty by emphasizing people or households that are severely deprived (Alkire & Foster, 2011b:479; Alkire & Santos, 2013a:245; Alkire & Seth, 2009:13). It is expressed by the product of the percentage of multidimensional poor H , the average deprivation across the poor A and average squared poverty gap among the poor S (average severity of the poor): $M_0 = H * A * S$. Adjusted squared poverty gap M_2 measure is sensitive to the number of deprivations the poor suffer, the depth of the deprivations and the inequality of deprivations among the poor.

1.8 ETHICAL CONSIDERATIONS

The research study has complied with the ethical standards of academic research. Approval was obtained from the authorities of the Ethics Committee of the Faculty of Economic Sciences and IT at the North-West University, Vaal Triangle Campus. Approval was obtained after examining the questionnaire to be used and the authorising letter from the local authority of Qwaqwa to conduct the study in the area.

The questionnaire was accompanied with a letter explaining the importance and purpose of the research, to assure confidentiality and encourage response. Participation in the research was voluntary and participants were allowed to withdraw at any stage. Participants were assured that their responses would remain anonymous.

1.9 CHAPTER CLASSIFICATION

This study has the following chapters:

Chapter 1: The problem and its setting

This chapter provides an introduction to the study, the problem statement, the geographical location of the case study, the importance of the study, the research objectives and a brief description of the research methodology. The chapter concludes with ethical considerations and a summary of the organisation of the whole study.

Chapter 2: Literature review

Chapter 2 presents an overview of poverty in general and multidimensional poverty research internationally. The chapter discusses applicable definitions and theories of poverty, both historical and empirical.

Chapter 3: Poverty in South Africa

This chapter reviews fundamental theories and the empirical findings from investigations conducted on poverty in South Africa, as well as in the former South African homelands.

Chapter 4: Research methodology

Chapter 4 describes the research design and methodology used to collect and analyse data. It describes the data used in the study.

Chapter 5: Results and findings

Chapter 5 presents the results, with a detailed discussion of the findings. It compares the result of different methodologies (monetary compared to multidimensional approach)

Chapter 6: Summary, conclusions and recommendations

This chapter presents the theoretical foundation of the study, concluding remarks and policy recommendations, limitations of the study and areas for further study.

CHAPTER 2: CONCEPTUAL REVIEW OF POVERTY

2.1 INTRODUCTION

Poverty exists in numerous developed nations and characterises all the regions of developing countries (UN, 1995). In order to achieve sustainable economic growth, halving extreme poverty by the year of 2015 became one of the major goals of development efforts for many countries. This is indicated by the fact that the international community has adopted the Millennium Development Goals (MDGs) and the Poverty Reduction Strategy Papers (PRSP). Particular effort has been made to “eradicate extreme poverty and hunger”, the first goal of the MDGS. Progress to this end remains a mirage in numerous countries. As highlighted in the UN (2013:3) report, the achievement of MDGs has been uneven among and within countries. This tardy progress raises crucial questions about the concept and understanding of poverty, as well as the policies and strategies that have been adopted to achieve poverty reduction. Nevertheless, a sound strategy of poverty reduction is the result of a sound analysis of poverty (Rippin, 2009:2). The rationale for conceptualising poverty is mostly founded on the idea that the concepts utilised to define poverty determine which criteria should be used to measure it. As a result, the policy-makers would design and develop policy implications and programmes to address poverty according to what has been found by the measurements.

While there is unanimous agreement on poverty as the main challenge of the international community, the meaning in conceptual terms of what constitutes poverty, how to measure it and to monitor its reduction progress, remains uncertain (Mowafi, 2003:1). This stresses the fact that poverty is a multifaceted phenomenon, which has many indicators. A more crucial concern is whether income deprivation is the most appropriate benchmark to gauge poverty or should it be supplemented by other indicators. The World Bank (2005:9) stated that poverty is a multidimensional phenomenon which is less amenable to simple solutions. Perceptions of poverty have advanced considerably, with prevalent recognition of the multidimensional nature of poverty and the importance of counting the depth and severity of poverty. The analysis of multidimensional poverty has seen a growing body of innovations on

how best the multidimensional nature of poverty could be extrapolated, except for a void of a broad consensus for practical application.

Given the significant task that the poverty definition plays in showing the indicators for the measurement and the significant role played by the measurement in identifying the poor, policy-makers are tasked with developing well-targeted anti-poverty policies. Chapter 2 discusses some approaches to the definition and measurement of poverty, in general, and multidimensional poverty, in particular. In this regard, the traditional monetary approach and the more broad-based multidimensional approaches are discussed. Understanding the various approaches to the definition and measurement of poverty necessitates an investigation of their historical development and contexts (Rio Group, 2006:16). Therefore the historical overview of poverty research has been discussed, but kept brief, considering their importance to the present study.

2.2 HISTORICAL OVERVIEW OF POVERTY RESEARCH

Over time the meaning of poverty and how to measure it has changed, while many of the basic concerns remained common. Poverty research through scientific examination was coined by Charles Booth in London in the late 1880s (Spicker, 1990:3). Booth's concern was raised by socialists and many journalist reports detailing the increment of poverty in London. He wanted to verify whether those reports are based on solid evidence or not. Booth used what he named the 'line of poverty' and classified people of London into two categories, those 'in comfort' and those 'in poverty'. However, Booth did not provide an operational definition of application of that particular line of poverty. Alcock (1987:3) revealed that Booth fixed it arbitrarily at 18 shillings to 21 shillings per week. Booth defined the poor as those "living under a struggle to obtain the necessities of life and make both ends meet", while the very poor live in a state of chronic want (Booth, 1902:33) (Series: Poverty, Vol.I). It is important to note that other researchers have afterward described the line separating the poor from the non-poor as he 'poverty line', a term which is synonymously with 'line of poverty' coined by Booth. Booth's studies were built upon and followed by those of Seebohm Rowntree in the city of York in northern England

(Rowntree, 1901). Rowntree (1901) distinguished two categories of poverty, namely primary and secondary poverty. Primary poverty included families whose income is insufficient to maintain mere physical efficiency while those living in secondary poverty had sufficient income for the maintenance of physical efficiency, were it not for the fact that some portion of it is absorbed by other expenditure, either useful or wasteful (Rowntree, 1901:115). Rowntree (1901) provided an empirical method of defining the minimum needs for the maintenance of mere physical efficiency. His poverty line was estimated on the basis of nutrition, clothing, household sundries, fuel and accommodation (Rowntree, 1922:54; Townsend, 1954:131).

These contributions inspired further theoretical, methodological and empirical development. Even though there were certain minor amendments to Rowntree's approach to measure poverty, including adjustment according to price variations, other subsequent studies in the next 40 years adopted the similar approach, where the yardsticks used for measuring poverty were similar (Pichaud & Webb, 2004:30; Townsend, 1954:131). This idea of using subsistence standards to define poverty can, therefore, be considered as the dominant poverty concept of that time. The early poverty researchers measured poverty in absolute terms related to a concept of physical functioning (Gazeley & Newell, 2007:2; Niemietz, 2011:11, 56; Ravallion, 2011:12). In this case, poverty is measured by the value, in real terms, of a given level of goods ensuring some form of minimum subsistence (e.g., the value of basic food or the minimum income required to have decent lives) (Bellù & Liberati, 2005:4).

The earliest attempts to define poverty in absolute terms considered the minimum diet covering the minimum cost to achieve a defined energy intake for every household. The main and most important shortcoming of this approach is how it determines what a nutritionally adequate diet, is since minimum diet costs might differ both within and between households as their preferences in terms of nutrition patterns differ (Bellù & Liberati, 2005:4; Greeley, 1994:9; Townsend, 1954). The challenge is that human diversity is ignored in absolute poverty theories, which make inter-personal comparisons difficult. The most frequent illustration given is that of a person suffering a parasitic infestation. These would need a higher quantity of food

to fulfil their nutritional requirements, compared to those who are free of parasites (Bellù & Liberati, 2005:4).

Rowntree's inquiry (1899; 1936; 1950) and others guided scientific exercise in Britain (Freeman & Bliss, 2001:1) and international policy implications for the rest of the century. This is illustrated by the adoption of the statistical measures to define social conditions within countries and the wide implementation by international organizations like the International Monetary Fund (IMF) and The World Bank Institute. The absolute approach has been used to measure poverty in the USA and Canada, even though it was elaborately formulated (Rio Group, 2006:55).

Niemietz (2011:11 & 58) argued that the confusing characteristic of Rowntree's work was the high extent of what he named "secondary poverty" in his findings (two-thirds of the poor population in York). Secondary poverty was described as a condition of families which happened to have enough resources but spent them unwisely and thus did not have basic necessities. According to Rowntree (1922:29-30), mispending involved 'gambling, ignorant extravagance, or expenditure upon drink'. This apparent paradox was later, in the 1950s and 1960s, given an alternative description by Peter Townsend as 'relative deprivation'. For Townsend (1962:225), people are rich or poor, referring to their share of resources that are available to all. Therefore poverty is a relative deprivation and not an absolute state. Needs are not purely physical, they are almost a social concept related to the development of general living standards. Townsend (1954:134) emphasised that the pattern of spending among poor people is largely determined by the accepted modes of behaviour in the communities in which they live. A person does not live on a desert, island alone, as in the historical fiction of Robinson Crusoe. A person lives in a social context which necessarily influences his spending behaviour (Townsend, 1962:219). According to Townsend (1979:31), "Individuals, families and groups in the population can be said to be in poverty when they lack the resources to obtain the types of diet, participate in the activities and have the living conditions and amenities which are customary, or at least widely encouraged or approved, in the societies to which they belong. Their resources are so seriously below those commanded by the average

individual or family that they are, in effect, excluded from ordinary living patterns, customs and activities”.

In the 1960s, Runciman (1966) amplified poverty research with the concept of relative poverty related, but not identical, to Townsend's relative deprivation. Relative deprivation does not refer to income gaps *per se*, but to perceived unmerited and alterable income gaps by the members of well-off groups. Inequality does not need to be particularly high for relative deprivation to happen, when a small lead by the better-off is perceived to be unmerited (Niemi, 2011:62). In other words, relative deprivation appears when it is widely tolerated by the less well-off group but that inequality is not large. Relative poverty is purely a function of income distribution, irrespective of how it rises and how it is being perceived (Niemi, 2011:62). Both concepts agree in pointing the spotlight towards distributional considerations rather than people's absolute command over material resources. Runciman (1966) emphasised that people's material living standards should not be assessed in a vacuum, but on relative yardstick standards, mostly those of other people in the society.

A relative approach to poverty emphasises that someone's poverty position depends on the condition of others in the society (De Vos & Garner, 1991:268). People can be able to meet their basic needs, regardless of being relatively poorer than the most of their fellow citizens, and this is the case in many developed countries (Galbraith, 1958: 323, Galbraith, 1977:252, McLachlan, 1983: 97). This suggests that poverty should be treated as a simple characteristic of stratification and inequality. For instance, one could classify as poor those persons whose income is below 50% of the mean income of the society. If the mean income of the non-poor people increases because they earned more, relative poverty might be higher (Bellù & Liberati, 2005:4). This concept certainly indicates the change in social and economic situation in a given country. The core weakness of this approach is that if poverty is defined as a fixed proportion of a certain synthetic indicator of the income distribution (e.g. mean or median), one may say that it is difficult to vanquish relative poverty, since it moves when income rises, unless the income distribution is perfectly equal. Over time, understanding of poverty in terms of relative concept has gradually

replaced the absolute poverty. Most campaigners for relative yardsticks argue that this measure is not appropriate to developing countries (Brady, 2003:721). The highly shared view was that absolute poverty is a suitable focus for developing countries, while relative measures of poverty should be applied in developed countries (Brady, 2003:721).

During the 1970s, a new concept of social exclusion related to poverty emerged from the secretary of state for social action of the French government, René Lenoir. Lenoir (1974) stressed that social conditions have numerous dimensions, which necessitate to be dealt with in a multidimensional way. Excluded people, according to Lenoir (1974), were mostly single parents, marginal, multi-problem households, invalids, handicapped, abused, substance abusers, suicidal individuals and other social 'misfits'. The followed literature has vastly added a series of aspects of socioeconomic problems to the existing bulging list of the 'socially excluded' of Lenoir (Sen, 2000:1). In the late 1980s, the social exclusion approach was adopted by the European Union as a key concept in social policy and in voluminous cases which replaced the concept of poverty (Rawal, 2008:1). This marked one of the early multivariate attempts to deal with poverty. Seeing poverty in terms of income did not end, however.

In the same era of the 1970s, an international report of the Institute of Development Studies and The World Bank, entitled 'Redistribution with growth', was published and was mainly concerned with inequality, but also addressed the dimensions and causes of poverty (Chenery *et al.*, 1974). This was the first international report to identify the number of people living below the poverty line (Ridell, 2004:2). Building upon this work, the International Labour Office (ILO) (1976) extended the existing subsistence concept and became one of the early proponents of what became known as the 'basic needs approach' to development. Additional to material needs for individual physical survival and efficiency in defining poverty, the ILO (1976:24-25) suggested that facilities and services should be included in the definition of poverty. Therefore the ILO (1976) defined the basic needs approach as twofold. Firstly, as minimum requirements (for a household) for private consumption: adequate food, shelter and clothing, as well as certain household equipment and

furniture. Secondly, access to essential services provided by, and for, the community at large, such as safe drinking water, sanitation, public transport and health, educational and cultural facilities (ILO, 1976:24-25; Townsend, 2006:6).

The fundamental framework through which poverty should be addressed, according to the basic needs approach to development was, to focus on the poor population and the need for redistribution. This approach dominated donor development policies for a short time towards the end of the 1970s. However, the governments of developing countries perceived it as a diversion from their requests for improved terms (industrialisation and growth) in the international system and they thus did not support it (Stewart, 2006:14). Although academic research continued to use this approach, the debt crisis and political change in certain major donor governments led to its fast and permanent scrapping (Stewart, 2006:14). Yet the basic needs approach provided a way forward for some of the multidimensional approaches to poverty including the human development approach. By the early 1980s, the emphasis of major policy-makers was no longer to address needs, including doing so directly by targeting poor people. Attention shifted towards economic growth (as it was once done in the 1950s and 1960s), specifically factors which were believed to hamper economic growth. This era of stabilisation and structural adjustment policies, was based on the idea that once growth started to accelerate, major intrusions into poverty would be seen. More emphasis was placed on education and health.

Promoting development and human well-being was the recurring themes of Sen's series of books and papers dating from the 1980s. His thoughts were different from other economists of that time. Sen has played an important role in directing the economics and development studies patterns away from the exaggerated focus on growth and towards issues of personal well-being, agency and freedom (Clarck, 2005:1340). Ultimately, the emphasis should be on what people are effectively able to do and to be, that is, on their capabilities. Sen's capability approach seemed to bring together many of the concerns of basic needs theorists (Stewart, 2006:18).

The 1990s marked the advent of full attention to poverty, where alternative paradigms to the understanding of poverty were developed and generated various

approaches to policies and strategies of development. The year 1990 witnessed the beginning of the annual Human Development Report (HDR), which brought together the ideas from the basic needs approach and capability approach (Stewart, 2006:18). UNDP (1990:1) noted that one of people's choices might be the access to income but that should not be considered as the total sum of human endeavour. Human development is a procedure of wide-ranging personal choices. The most crucial choices involve living a long and healthy life, being educated and having access to the resources necessary for a decent living standard (UNDP, 1990:1). On the basis of the score of these three core elements of human development, UNDP (1990:11-13) built a Human Development Index (HDI).

This work of the HDR enriched, and contributed to, the understanding of poverty, particularly to the acknowledgement of the growing body of poverty as a multidimensional concept insufficiently assessed merely by focusing on income levels and scores. The HDI was later (in 1997) complemented by the Human Poverty Index (HPI), which was considered to better reveal the extent of deprivation in developing countries (HPI-1) and in select high-income OECD countries (HPI-2), compared to the HDI. Riddell (2004:2) added that this era denoted the adoption of a participatory approach to the understanding and analysis of poverty as a formal method. Participatory inquiry and a research approach to poverty take into consideration the belief of people living in poverty, by giving them the right to participate in the analysis of their own condition and how to fight it. It also means that the perspectives and ideas of people experiencing poverty themselves are seen as key to achieving a more all-inclusive and in-depth understanding of poverty (Bennett & Roberts, 2004:6).

The year 2000 marked the period where the international community officially adopted the MDGs, as eight international goals for host governments and donors to end human poverty by 2015. The first goal is to eradicate extreme poverty (absolute poverty) and hunger, with subsequent goals stressing education, gender equality, child mortality, maternal health, HIV/AIDS and malaria and environment sustainability. Criticism surrounding these MDGs emphasises the lack of adequate yardsticks to assess certain goals and uneven progress to achieve goals. For

example, poverty was solely defined in terms of income. For development economists, the maximisation of economic growth was no longer assumed to be sufficient even if it is necessary in order to eradicate poverty. However, it had to be “pro-poor growth” (although not yet satisfactorily defined), accompanied by particular strategies targeting specific groups of poor people (Riddell, 2004:3).

The elimination of \$1.25/day poverty is doubtful to denote the end of the countless overlapping disadvantages suffered by individuals experiencing poverty, including malnutrition, poor sanitation, lack of electricity and ramshackle schools. A global Multidimensional Poverty Index (MPI), involving 10 indicators, is under study and could be used as a headline indicator for the post-2015 MDGs. So far, in 2010, the UNDP, in co-operation with the Oxford Poverty and Human Development Initiative (OPHI) (based in the United Kingdom) introduced the MPI as a replacement and improvement of the Human Poverty Index (HPI) (Alkire & Santos, 2010; UNDP, 2010).

2.3 POVERTY DEFINITION

Definitions of poverty are debatable. Scott (1994:17) viewed poverty as a very contested concept. The basic problem to be addressed by every poverty analysis is the issue of how poverty should be defined and who to include in the category of the poor. Alcock (1993:67) pointed out that the matter of definition remains at the heart of the task of understanding poverty. Over time, a range of concurrent definitions and measurements of poverty have been suggested by academics and experts in the field. Until now the discussion continues to be controversial. The common part of all definitions of poverty is that poverty, however, is regarded as a status in which a reasonable living standard is not achieved. A synthesis of the different views has been compiled by The World Bank.

2.3.1 Basic definition of poverty

The word poverty can be considered to have a cluster of various overlapping meanings, depending on which subject area or discourse is being examined. A synthesis of the various positions has been made by The World Bank (2005:9-10):

“Poverty is the *lack* of, or the *inability* to achieve, a socially acceptable *standard of living*”. Bellù and Liberati (2005:2) pointed out that three key words in this definition are worthy of special attention.

Lack: the lack of command over economic resources constitutes the basic case situation for the definition of poverty. For instance, a person could be regarded as poor if he/she lacks basic food or shelter or, equivalently, if he/she lacks income to purchase these basic needs.

Inability: This is always associated with the capability failure to participate in a society, a concept established by Sen (1985). The capability, as described by Sen (1979:40), is the capability to function. It represents the various combinations of *functionings* a person can achieve. Functioning refers to what a person manages to be or do, while capabilities refer to the ability of a person to achieve *functionings* (Qizilbash, 1996:144; Saith, 2001:8; Sen, 1985:10; 1987:36). *Functionings* may be very basic (food, shelter) or complex (self-respect, freedom, social inclusion). The inability to achieve these *functionings* makes the individual poor. Bellù and Liberati (2005:2) gave the example that disability not only decreases capacity to earn income (which refers to the lack of command over economic resources), but also to convert income into resources is very difficult, even if, in terms of income, that achievement is possibly doable. From this point, Bellù and Liberati (2005:2) defined poverty as a condition symbolised by levels of capabilities that are unacceptably low, relative to the society.

Standard of living: Poverty depends on:

- What is considered to be a socially acceptable living standard at a given time in a given society. For example, the use of public transport in a society where the majority of people own cars might be an indicator of poverty. In a highly technological, advanced society, not having a TV may again be a signal of poverty, while in some other societies having a TV is a luxury.
- The way this standard is assessed, i.e. which variable(s) are used to capture the living conditions.

Even though this basic definition tried to combine many approaches to poverty (subsistence, capability and relative poverty), the problem of defining poverty is not fully solved. There are considerable controversies concerning whether poverty should be defined in only monetary terms or as a multidimensional phenomenon. The present study emphasise that poverty never results from the absence of a single item, but from many interlocking factors that cluster in poor people's experiences. Academics (Alkire & Foster, 2011b; Lustig 2011; Ravallion 2011:236) and international institutions (UNDP, 1990; World Bank, 2000) now agree on at least one key point, that poverty is multidimensional, but the dispute comes on how to measure it. For instance, UNDP (HDRs) defines and provides statistics that indicate the diversity of poverty reality by having measures such as the HDI and HPI that include other aspects of human development, such as health and education. In spite of acknowledging poverty as a multidimensional issue, The World Bank still follows the unidimensional monetary approach. The arising issue in the multidimensional approach is to define which dimensions to include and who should be considered. The multidimensional poor, as expressed by the horizontal and vertical vagueness of poverty.

2.3.2 Horizontal and vertical vagueness of poverty

In the analysis of poverty, there is no agreement concerning the selection of relevant indicators, the selection of the 'bottom line' on overall dimensions and in terms of each indicator (Quizilbash, 2004:1). Indicators, though not exhaustive, include education, literacy, malnutrition, housing, clothing, safety, health, income, sanitation and clean water. Depending on place and time, Quizilbash (2003:51) reasoned that certain dimensions contribute more to poverty than others. Horizontal vagueness refers to the imprecision about the range of dimensions of poverty, while vertical vagueness refers to the one on the critical level in each dimension, below which an individual must fall to be categorised as poor or non-poor (Quizilbash 2003:50). In the case of measuring nutrition, for example, there might be minimal nutritional requirements, but a similar caloric bundle will yield distinct nutritional outputs across a sedentary office worker, a labourer with a high metabolism, a pregnant woman or a

very elderly person. It therefore appears that there is no clear threshold where nutritional poverty starts or where it ends.

In money-metric measures of poverty, the problem of horizontal vagueness is not always disclosed because of the use of one dimension (income/expenditure) when measuring poverty. Quizilbash (2003:51) pointed out that when poverty is defined in terms of income necessary to avoid some level of deprivation, according to a defined set of dimensions of deprivation, horizontal vagueness might be relevant. This is when the basket of necessities considered determining the poverty line includes the costs of other poverty indicators, such as nutrition, shelter and energy (Van der Walt, 2004:8). Vertical vagueness is very relevant when defining the income poverty line (the minimal critical level of income below which a person must fall to be poor) in order to make a clear distinction between poor and non-poor (Van der Walt, 2004:8). This vagueness of poverty contributed largely to the discussion on, and complexity of measuring poverty.

2.4 POVERTY AND WELFARE

Household poverty is the lack of command over market and non-market goods and services, while household welfare is a positive function of a household's command over such resources (Ravallion, 1996:201). Poverty as a multidimensional concept is defined in many ways and sometimes definitions vary from one country to another. However, any definition of poverty contains a certain level of welfare, below which an individual must fall to be considered as poor. Lipton and Ravallion (1993:1) said that poverty exists when one or more people fall short of a level of economic welfare considered to be a rational minimum, either in some absolute sense or by the standards of a specific society. According to The World Bank (2000:15), poverty is pronounced deprivation in well-being. There are numerous contesting approaches to poverty and welfare definition and assessment. As a result, it is not practical to review each of them in this study, but the most prominent are worth discussing. Ravallion (1994) identified two important approaches characterising the assessment of well-being for poverty analysis. These approaches Ravallion (1994:4) described

as the welfarist and the non-welfarist approaches. These approaches are discussed in the following subsections.

2.4.1 The welfarist approach

Welfarists stress the existence of market imperfections and incompleteness and the lack of perfect correlation between relevant dimensions of well-being (Duclos & Araar, 2006). Certain key theoretical foundation elements of the welfarist approach are based on classical microeconomics, where preference ordering over goods was considered to be represented by welfare or utility function (Ravallion, 2008:3). The value of the utility function is considered to be the major dimension in assessing the behaviour and the well-being of individuals (Ravallion, 1994:5). Classical microeconomics posits that people are rational and that they are assumed to be able to choose the standards of living and activities which maximize their utility and happiness (Duclos & Araar, 2006:2). Given their initial endowments (including time, land and physical, financial and human capital), individuals make production and consumption choices using their set of preferences over bundles of consumption and production activities, taking into account the available production technology and the consumer and producer prices that prevail in the economy. Likewise, under additional assumptions (such as the existence of competitive markets and perfect information and absence of externalities, thus restrictive assumptions), a society where all individuals act independently with free choice, the process will lead to a situation in which it is impossible to further improve an individual's utility without making at least one other individual worse off (Duclos & Araar, 2006:2). This situation is known as pareto-efficient.

Underpinning the welfarist approach to poverty, a good note should be captured from the information provided by individual behaviour, when measuring poverty. More specifically, the judgement of individual's well-being should be in line with the ordering of preferences disclosed by that an individual's free choices. For example, depending on the poverty analyst and income/consumption benchmark used, an individual could be seen as poor, but the same individual could be able to be non-poor (*i.e.* have the working capacity) (Duclos & Araar, 2006:2). This might be shown

by the observation of a deliberate and free choice on the part of the individual to work and consume little, when the capability to work and consume more nevertheless exists (Duclos & Araar, 2006:2). The individual could reduce consumption (possibly for the increment of leisure, i.e. work less) and show that he/she is more satisfied than he or she was consuming more and working more.

Using non-welfare analysis, that individual could be classified as poor, while a comprehensive utility judgement would categorise this individual as non-poor. Since a pure welfarist approach suffers significantly from practical issues, enough information revealing preferences should be carefully observed for it to be operational. For example, it is not enough to know that person's current features and income level to conclude that a person is non-poor or poor, but it should also be concluded based on how people perceive their own utility, whether below or above some poverty utility threshold (self-report). Other practical issues related to pure welfare are the necessity of measuring physical happiness or utility and comparing utility levels across people whose personal aspects, preferences and enjoyment abilities are different while prices change across space and time. An attempt to make interpersonal comparison is assumed to be spurious, leading to severe ethical problems, since economic well-being (especially utility) is mostly taken as a subjective concept (Ravallion, 1994:6). Without these limitations, the welfarist approach would define a poor person based on content but not on materially deprived. The question is how a grumpy rich person would be considered poorer than a contented peasant, while the former has a higher living standard than the latter (Sen, 1983:160). Therefore this comparison is made on standards of utility that is totally different from the living standards concept. Welfarist assessments of poverty often utilise imperfect but objective indicators (consumption or income) for utilities. The welfarist approach operational poverty definition is thus a lack of command over commodities, measured by lower consumption/income.

Monetary measures are frequently adjusted for difference in needs, inflation and household size and composition. Income and consumption are clearly far from being perfect indicators of economic well-being and utility. Money-metric indicators fail to take complete accountability of importance for well-being of non-market and public

goods (provision of public goods, including clean water, security and healthcare). Practically, it is difficult to give these goods accurate and consistent value in terms of price. The welfarist approach is strongly related to the classical economic theory that has been widely applied by numerous economists within their operations and the research work of institutions such as the International Monetary Fund (IMF) and The World Bank and ministries of finance and planning of numerous developed and developing countries.

2.4.2 The non-welfarist approach

Non-welfarists emphasise the necessity of directing the emphasis away from the narrower space of utilities to a wider space, where multiple dimensions are both instrumentally and intrinsically crucial. Several non-welfarist approaches have consistently contested the prevalent paradigm (welfarist approach). The very well-known non-welfarist approaches, among others, are the basic needs approach and Sen's capability approach (Duclos & Araar, 2006:5-7). The former stresses consumption, whereas the latter emphasises an individual's values and choices. As a result, the non-welfarist approaches lead to distinct anti-poverty policies. Each of them shows different strengths and limitations. In the next section these two approaches are discussed.

2.4.2.1 Basic needs approach

The basic needs approach has a relatively long history (Wong, 2012:4). It was officially adopted as a basic needs strategy by the International Labour Organization's World Employment Conference in 1976 and it became widely discussed and applied in the late 1970s (Streeten *et al.*, 1981:8). Streeten (1979:136) maintained that this approach has superseded the monetary approach, by mobilizing specific resources for specific groups identified as deprived in those resources and focusing on what should be provided instead of income. The central idea of the basic needs approach is that each individual should be able to pursue well-being. While certain approaches to poverty emphasised the possession of resources, the basic human needs approach emphasised not commodities but

offering the opportunity for all human beings to have a full life, stressing the poor (Streeten *et al.*, 1981:21).

In the basic needs approach, poverty assessment is built on a selected bundle of goods and services ensuring to measure whether people had adequate access to basic necessities which allow them to meet a minimum level of quality. The quality of life does not only include basic needs necessary for survival (such as food, health and water) but also security (including housing, safety and employment) and empowerment (education and participation in decision making) (Rippin, 2009:3). Rather than determining the amount of income necessary to afford the bundle of basic necessities, the basic needs approach defines a minimum consumption basket, where the achievement of these needs is assessed directly. The minimum levels are generally also defined roughly, for instance, enough food to avoid malnutrition, universal access to primary education, universal functional literacy, universal access to primary health care, clean water for all and reasonable quality of shelter for all (Stewart, 2006:16). This list was not scientifically derived, nor based on participatory exercise, but it is difficult not to agree that satisfying all of those needs would indicate considerable progress towards eradicating poverty.

It is important to note that the basic needs approach should not be conflated with Sen's *functionings* concept. Both concepts are well related and difficult to differentiate in practice, but they are different. *Functionings* refer to what a person manages to be or do (Qizilbash, 1996:144; Saith, 2001:8). In the words of Sen (1992:39), "the relevant *functionings* can vary from such elementary things as being adequately nourished, being in good health, avoiding escapable morbidity and premature mortality, *etc.*, to more complex achievements such as being happy, having self-respect, taking part in the life of the community, and so on". Duclos and Araar (2006:5) added that basic needs could be taken as the physical inputs necessary for people to achieve *functionings*, where basic needs are defined in terms of means instead of outcomes. Even though Streeten (1979:139) maintained that, in addition to the *concrete* requirement of human needs, in contrast to *abstract* concepts, and the focus on *ends* in contrast to *means*, the basic needs approach incorporates "nonmaterial" needs (Streeten, 1979:136). Stewart (2006:16) noted

that, in practical interpretation, the basic needs approach principally emphasised material goods and services.

Streeten *et al.* (1981:25) postulated that basic needs may be interpreted in terms of minimum specified quantities of such things as food, shelter, clothing, water and sanitation that are needed to preclude ill-health, undernourishment and the like. Unlike *functionings*, which may be generally defined for all persons, the specification of basic needs depends on the features of persons and of the societies in which they stay (Duclos & Araar, 2006:6). For example, the basic goods necessary for one to be healthy and not to be undernourished will be contingent to the climate and on the physiological features of the person. The clothes required for individuals not to feel embarrassed will depend on the customs of the society in which they live. Therefore, though the achievement of basic needs is a significant component in determining whether an individual has attained certain *functionings*, but this assessment should use information on someone's features and socioeconomic environment. The non-welfarist approach thus presents the idea of horizontal vagueness of poverty by including other poverty indicators in assessing on individual's well-being. When a number of these basic needs or *functionings* are not met, that individual would be considered as deprived. However, there are significant degrees of vertical vagueness in the attainment of basic needs and *functionings*. For example, to accurately define the meaning of being adequately nourished, the appropriate level of nutritional adequacy required for poverty measurement, or whether the average required for adequate nutritional functioning only, allows for the simplest possible nutritional efficiency or the highest diet.

The apposite breadth and depth of the basic needs and *functionings* concepts is definitely ambiguous, as, in addition to the level of *functionings* which make life sustainable and satisfactory, there are degrees of *functionings* which make it enjoyable. Duclos and Araar (2006:7) stated that the multidimensional, non-welfarist approach ignores the possibility of substitutability among *functionings* in achieving a given level of well-being.

Although the basic needs approach is easy to apply, it faces many shortcomings. The main limitation is that the components of the consumption bundle of basic needs are arbitrarily defined by a few professionals on the assumption that all individuals have an equal need for such goods in the predefined consumption bundle. This ignores the fact that individuals may give more importance to some needs over others. Here one can reason in the same direction as Townsend (1954:131), where he said that if clothing, money for travel to work and newspapers are considered to be 'necessaries' in the conventional sense, why not tea, handkerchiefs, laundry, contraceptives, cosmetics, hair-dressing, shaving and life insurance payments. To sum up, what the basic needs approach failed to address is that there exists a hierarchy of needs and it is totally up to the individual to decide his or her own priorities. The shared criticism with any other aggregate method of poverty assessment is that the method used to assign weights to the selected needs is often judged to be subjective (Thiele, 2001:14-15). Needs vary according to space, time and context. The basic needs approach is also said to be consumption-based. Stewart (2006:16) noted that, in practical interpretation, the basic needs approach principally emphasised material goods and services. All these shortfalls, and others, raised an alternative understanding of poverty, namely the capability approach.

2.4.2.2 Capability approach

The capability approach emerged in the 1980s. It was championed by Sen (1992). The capability, as described by Sen (1979:40), is the capability to function. It represents the various combinations of *functionings* (beings and doings) a person can achieve. These *beings* and *doings*, which Sen calls *functionings*, together constitute what makes a life valuable. Capability is thus a set of vectors of *functionings* which reflects the person's freedom to choose one type of life or another (Sen, 1992:40; 2001:87). Besides *functionings*, freedom is another constituent of capability that refers to the ability to choose and prioritise different combinations of *functionings* (Wong, 2012:7). Freedom is related to the real opportunities which individuals have to achieve what they value (Alkire, 2002:6). This implies that individuals should be free to decide how they want their life to be. Sen (2007:28-29) claimed that any argument on capabilities ignoring human freedom would be

considered inefficient. The capability approach stresses the ability of a person to function well in the society rather than achieved *functionings* in themselves. *Functionings* include being employed, leisure, being educated, receiving better health care, being healthy, participating in the community's activities and being respected. What is needed is that individuals get the freedom to live the lifestyle they would like to live, to be the person they wish to be and to do what they desire to do. Once these freedoms are effectively achieved, people can decide to act on those freedoms in the direction with their own thoughts of the kind of life they want to live (Hick, 2012:2; Robeyns, 2003:6). The capability approach differs, therefore from the *functionings* or achievements of an individual. For example, if it is a person's decision not to achieve certain *functionings*, that person will not be considered poor as long as he/she would be able to achieve them if he/she chooses so.

Duclos and Araar (2006:7) pointed out that this difference between *functionings*/basic needs approach and capabilities seems to be similar to the difference between income and consumption (indicators of standards of living in the monetary approach). Duclos and Araar (2006:7) argued that the capability to consume is reflected by income possessed. Consumption functioning may thus be recognised as the result of the use of that capability. Consumption occurs merely when an individual decides to exercise his/her capacity to consume a given income. The lack of direct *functionings* or consumption reflects deprivation in the basic needs and functioning approach, while poverty occurs in the capability approach when there is a lack of capabilities and incomes, which are imperfectly associated with the *functionings* actually achieved.

The merits of the capability approach are becoming increasingly evident, especially in the context of developing countries, as the existence of market imperfections, information asymmetries, lack of market access and other violations of the assumption inherent in the use of money-metric poverty measures are being more widely recognised

2.4.2.3 Comparing the two non-welfarist approaches

The fundamental difference between the basic needs approach and the capability approach is that they have distinct philosophical foundations. Wong (2012:8) explained that the basic needs approach asserts that individuals should be guaranteed subsistence means, in order to attain good living. Conversely, the capability approach maintains that well-being is not only guaranteed by material consumption, but also individuals' freedom to choose one type of life or another. This indicates that the philosophical roots lie on valuable life and freedom, which nearly reshape poverty into a wider concept of human development. Yet the difference between these two approaches is not based only on philosophical foundation. However, the way poverty is understood by the theorists of these approaches differs, too. Basic needs theorists consider poverty as a condition of consumption deprivation (such as inadequate education, lack of clean water, undernourishment) (Stewart, 2006:16). Alternatively, the capability approach defines poverty as a failure of certain basic capabilities to function and a lack of the opportunities where the sets of opportunities stand for the lifestyles that individuals value.

Since different definitions of poverty require different policy implications for poverty alleviation, the basic needs and capability approaches have a distinct impact on poverty reduction strategies. Poverty, according to the basic needs approach, focuses on consumption, which implies that poverty reduction strategies should aim at providing adequate access to the predetermined consumptions. Instead of focusing on consumption, the capability approach emphasises equal opportunity. Wong (2012:9) tried to clarify this point with the following example. Suppose that there is a project-type intervention which supplied piped water for a poor rural community. This project would be judged successful according to the basic needs approach if the percentage of households who gained the access to clean water effectively increased. However, the capability approach would look at that as freedom, in the sense that women or children who had to go to fetch water from nearby streams or wells would use the saved time as an opportunity to attend full-time education for children, while women could have the extra time to devote to

employment. This indicates that the major emphasis of the capability approach lies in empowerment.

The basic needs and capability approaches exhibit different power relationships between the poor and the policy-makers. Under the former, professionals often determine the consumption bundle and one can conclude that it is an arbitrary process, since it does not consider the opinion of the poor at their operational level (Sen, 1984:515). Therefore this approach is fundamentally paternalistic in nature, as it dictates the consumption patterns of the poor (Stewart, 2006:15).

Contrarily, the proponents of the latter abstain from establishing the sets of valued *functionings* and recommend genuinely deliberative discussions or public reasoning in order to reveal significant individuals' valued *functionings* (Sen, 2004:78). The use of a predefined consumption bundle in the basic needs approach enriches its applicability, regardless of the idea that it encourages policy-makers to implement a general consumption bundle and allows regional diversities. As for the capability approach, its focus is on local values and choices of discussion on capabilities at multiple levels. However, this comparison shows that both approaches emphasise catering needs at different levels, while the former highlights generality and the latter one highlights local specificity. Alkire (2002:170) stated that the capability approach contributed to the extent of making some implicit assumptions of the basic needs approach into explicit ones about the value of choice and participation. Table 2.1 portrays the major characteristics of both approaches.

Table 2.1: The major characteristics of the basic needs approach and the capability approach

	Basic needs approach	Capability approach
Philosophical foundation	People should achieve minimum subsistence	People should have equal freedom to choose their valued ways of life
Definition of poverty	Deprivation of consumption	Deprivation of opportunities
Poverty reduction	Ensure adequate access to consumption	Equal opportunity to make choices
Policy objective	Subsistence	Empowerment
Power relationship	Paternalistic	Deliberative
Level of application	Generalised but allows regional diversities	Multiple levels, with emphasis on localisation

Source: Table adopted from Wong (2012:10)

2.5 MEASURING POVERTY

A poverty measure is an index synthesizing all information available about the poor population (Bibi, 2003:1). Poverty measures are usually used to monitor socioeconomic situations and to present standards of progress or failure. The policy-makers will design and develop policy implications and programmes to address poverty according to what have been found by the measurements, while the impact of events (e.g. runaway inflation or the introduction of a government transfer programme) can be weighed. Poverty statistics play significant roles in précising complex socioeconomic circumstances that inform discussions about economic and social priorities. For this reason, effective measures need to consider most relevant aspects of poverty. Poverty may be represented by a unidimensional indicator (income/consumption) or a multidimensional approach (such as living standards, health conditions and education). In the following subsection, unidimensional and multidimensional measurements of poverty will be discussed.

2.5.1 Unidimensional measurements

For a very long period of time, policy-makers worldwide have embraced a unidimensional perspective of poverty (Wong, 2012:3), where poverty is defined on a single monetary indicator for standards of living. Poverty was described as a state of deprivation of financial resources, or simply as a state of income-deficiency. The assumption is that the level of income or its proxy consumption could describe accurately if individuals are able to achieve certain minimum thresholds on various dimensions such as nutrition, clothing and housing. The use of a monetary approach often assumes that these indicators (income/expenditure) are suitable proxies for multifaceted poverty and that individuals who are income poor/consumption-poor are almost the same as those who experience malnutrition, are ill-educated, or are disempowered. The consumption indicator is the most used poverty indicator, as it is said to better reflect the concept of the permanent income of a person (Bellù & Liberati, 2005:3; Haughton & Khandker, 2009:30), since to accurately estimate income would be more difficult (Coudouel *et al.*, 2002:30). This approach identifies poverty with a shortfall in consumption (or income) from some poverty line. A poverty line is a fixed level of income or expenditure needed to afford a basket of goods and services that satisfy the individual or household consumption at a minimum level in order to be out of poverty (Carraro, 2006:2). The poverty line is used to distinguish the poor from the rest of the population for policy, administrative and research purposes.

They are three major types of poverty lines namely absolute, relative and subjective poverty lines (Ravallion, 1992; Rio Group, 2006). Absolute poverty lines represent the cost of purchasing a basket of necessary items that allows one to meet the absolute thresholds of satisfying certain basic needs (Rio Group, 2006:53). Ravallion (1992:25) suggests that an absolute poverty line should be fixed in terms of the standard indicator being used and fixed over the entire domain of the poverty comparison. Absolute poverty lines are only adjusted for inflation and do not move with economic growth, average income and changes in the standard of living.

Relative poverty lines are set on either the median or mean of equalised aggregated income of the population (Bourguignon, 2004:1). The relative poverty line depends on some income distribution characteristics, so that the line changes with the average standard of living. This line varies over time and across space. There is a tendency to revise the relative poverty line upward once a country's economic performance improves (Houghton & Khandker, 2009:44) and a downward revision during recessionary periods (Carraro, 2006:3). For instance, if it is set at 50% of the mean income, the growth of the aggregate national income will imply an increase in the relative poverty line.

Beyond absolute and relative poverty lines is an understanding of subjective poverty lines. Subjective poverty lines are set on the basis of subjective judgements of people about what they believe to be in the component of an acceptable social minimum level of living standards in society (Ravallion, 1992:33). As suggested by Kapteyn *et al.* (1988:223), a subjective poverty line is constructed on the basis of survey responses to the following question: What level of income do you, in your circumstances, consider to be absolutely minimal, in other words, the minimum income that you could not make ends meet with/ The major feature of the subjective approach, according to the Rio Group (2006:75), is that the threshold between the poor and non-poor is based on how people perceive their own well-being.

There are numerous income/expenditure measures of poverty, but the following section will present only some of the most commonly used measures, since the main focus of this study is multidimensional analysis. The Foster-Greer-Thorbecke (FGT) family of measures and the Sen Index will be discussed in this section, as they will be introducing the Alkire and Foster methodology which will be discussed later in this chapter. The Alkire and Foster methodology is the one that will be undertaken in this study. It uses an explicit axiomatic property structure (suggested by Sen) to generate a family of multidimensional poverty measures that are directly comparable with the analogous FGT indicators.

2.5.1.1 Foster-Greer-Thorbecke (FGT) measures (P_α)

The FGT poverty measurements are a family of three indices, namely headcount index, poverty gap index and squared poverty gap (Foster *et al.*, 1984). For all three FGT poverty measurements, the greater the index, the worse the poverty condition is.

$$\text{The general formula of FGT indices is } P_\alpha(Y_i, Z) = \frac{1}{N} \sum_{i=1}^q \left(\frac{Z - Y_i}{Z} \right)^\alpha \quad (2.1)$$

Where;

N: population size,

Z: poverty line,

Y_i : per capita income of poor person i , and

α is the poverty aversion.

The FGT poverty measure of the entire population is provided by the poverty measure of a group as a whole weighted average of poverty measures of individuals in a group. When $\alpha=0$, the equation (2.1) will be the headcount index. The headcount index (P_0) or incidence of poverty identifies the proportion of population whose income is less than the poverty line. In other words, it is simply computed by comparing the income Y_i of each individual/household to the poverty line Z .

This measure is widely used, based on the idea of being easy to understand and compute, but it fails to satisfy the principles of monotonicity and transfer axioms (Sen, 1983:165; 1979:294-298; 1976:219). The monotonicity axiom states that a decrease in income of a poor individual below the poverty line should increase the poverty measure (Sen, 1976:219), i.e. whenever the income of a poor individual decreases, the poverty measure increases.

The transfer axiom states that a pure transfer of income from a poor individual to anyone who is richer must increase the poverty measure (Sen, 1976:219). The small difference between these two axioms is that the former requires the decrease of the

poverty measure, provided that the individual moves from poor to non-poor, while with the latter, the individual should remain poor. The reason why Sen (1976:225) proposed the transfer axiom is because a poverty measure should not be insensitive to the level of inequality among poor individuals. Based on his deprivation theory, whenever the inequality of income among poor persons falls, the poverty measure decreases and the relative deprivation decreases as well. The headcount index is not sensible to the depth and severity of poverty when measuring the extent of income below the poverty line.

If $\alpha=1$ the equation (2.1) will be the poverty gap index. The poverty gap index captures the degree of the mean income shortfall of an individual relative to the poverty line across the entire population (Chaudhry, 2003:115). In other words, it measures the amount of income by which each person falls below the poverty line (Makoka & Kaplan, 2005:19). When that difference is expressed as a proportion of the poverty line, it is the poverty gap. The poverty gap index is obtained by adding up all shortfalls of the poor (assuming that non-poor have a shortfall of zero) and dividing the total by the population. This measure indicates the depth of poverty and how many resources would have to be transferred to the poor individuals to bring them out of poverty (minimum cost to get rid of poverty) (Makoka & Kaplan, 2005:20). However, the poverty gap index does not address the severity of poverty among the poor and does not take into account inequality among them (Makoka & Kaplan, 2005:20).

If $\alpha=2$ the equation (2.1) will be the squared poverty gap. This measure describes the severity of poverty since it takes into account poverty among the poor. It is defined as the average of the square relative poverty gap of the poor (World Bank, 2005:73). A transfer from a poor household to a poorer household would decrease the index. Haughton and Khandker (2009:71) claimed that the squared poverty gap is difficult to read and interpret. It is thus not commonly applied.

2.5.1.2 The Sen Index

Sen (1976:223-227; 1979:298) has suggested an index that sought to combine the effects of the number of the poor, the depth of their poverty and the distribution of poverty within the group. The Sen Index (P) is a combination of three parameters, namely headcount ratio, income gap index and the Gini coefficient (Sen, 1983:165; 1976:227).

The Sen Index is written as follows:

$$P = H[I + (1 - I)G] \quad (2.2)$$

Where G is the Gini coefficient computed on the poor persons' income

H stands for the headcount ratio

I is the income gap ratio

P can also be obtained by replacing I with its equivalent $1 - zy_q$

$$P = H[1 - y_q(1 - G)/z] \quad (2.3)$$

The index lies in the closed interval [0,1],

with $P = \begin{cases} 0 & \text{if everyone has income greater than the poverty line income} \\ 1 & \text{if everyone has zero income (which is generally ruled out)} \end{cases}$

Sen's Index takes into account the number of poor individuals among the entire population through headcount ratio H. Secondly, it takes into account the depth of poverty through income gap ratio I. Finally, it considers relative deprivation through the Gini coefficient (G), calculated on poor individuals' income. As a result, the Sen Index satisfies the monotonicity, weak transfer and focus axioms (Chaudhry, 2003:211). The focus axiom states that the poverty measure should focus completely on the poor's income (Haughton & Khandker 2009:74). Deaton (1997:147), however claimed that the Sen Index cannot be used to decompose poverty into contributions from different subgroups, which frequently give information

when monitoring changes in poverty. This index is almost never used outside of the academic literature, as it might lack the intuitive appeal of some of the simpler measures of poverty (Haughton & Khandker, 2009:74; World Bank, 2005:75).

2.5.1.3 General shortcoming of unidimensional measurements

Poverty has been recognised as a multidimensional phenomenon (Rippin, 2009:3). However, income (or consumption) was generally acknowledged as a suitable indicator to measure the multidimensional aspect of poverty. The fundamental and severe limitation of this method is how it assigns weights of zero to the potential dimensions of poverty and one weight to a single dimension (income/consumption) (Maasoumi & Lugo, 2006:2; Rippin, 2009:3). The income/expenditure indicator does not entirely denote the complexity of poverty; but it describes an incomplete picture of poverty, only. It is crucial to consider other dimensions that capture the complexity aspect of poverty, since every indicator indicates only a singular aspect of poverty (Miceli, 1998:iii). It is argued that monetary measurements of poverty often produce short-term results, instead of long-term and sustainable results (Lu, 2012:4; Fusco, 2003:2). Alkire & Foster (2011b) added that it provides insufficient policy guidance concerning deprivations in other attributes. Sen (1983:755) claimed that masses of populations died in famines because of the failure to realise how important entitlements are. In this case, entitlement does not simply depend on individual's commodity bundle (resource endowment), but their capability to exchange that bundle for another through trade and production (Sen, 1983).

According to Ravallion (1996:201), poverty is the lack of command over market and non-market goods and services. Income may have more effect on numerous economic resources. Poverty, however is associated with the lack of other fundamental aspects of life. Alkire and Santo (2013a:240) considered that income is merely a means to ends. The ends are valuable than the means. It can be expected that a person with a reasonable consumption budget or higher income may be able to enhance the position of a number of his/her monetary and non-monetary attributes. However, some indispensable needs may not be satisfied because the markets might not exist. It may happen with some public goods or when markets

operate very imperfectly. These are the cases where the availability of some attributes has to be provided by institutions. For instance, in most cases it is the state or non-governmental organisations (NGOs) which provide the availability of clean water, electricity and education.

Each household has a distinct capacity to translate income into *functionings* (Alkire & Santos, 2013a:239). Thorbecke (2005:5) presented an example that many household heads earn an income above the poverty line and mainly allocate it to satisfy wants for, say, alcohol and tobacco, instead of allocating it for a basic food basket in order to satisfy their children's minimum calorific requirements. In an analysis of poverty based on a monetary approach, such households would be categorized as non-poor, while some of their members, in reality, are deprived of some basic necessities and thus should be considered poor. Participatory inquiry to poverty research reveals that poor individuals themselves define their experience of deprivation using a series of dimensions, including health, nutrition, lack of adequate sanitation and water, bad housing conditions, low education, social exclusion, violence, shame and disempowerment (Alkire & Santos, 2013a:240).

Due to a large difference in definition of unidimensional and multidimensional approaches, who counts as poor is likely to differ, referring to the approach employed (Laderchi *et al.*, 2003:26). Although the unidimensional is easily applicable, the empirical studies prove that there is reasonable doubt of being accurate proxy for the multidimensional nature of poverty. For example, in a study of measuring poverty and deprivation in South Africa, Klasen (2000:33) compared a standard expenditure-based poverty measure with a specifically generated composite measure of deprivation using household survey data. It was found that the used measures differ significantly. The deprivation measure found more households deprived than expenditure-poor.

Notwithstanding the drawbacks of a unidimensional framework, there is no agreement on how best poverty should be measured. These limitations about the imperfection of expenditure/income-deficiency as a proxy of poverty led to the

introduction of a new approach of measuring poverty, known as the multidimensional approach which will now be discussed.

2.5.2 Multidimensional approach

For years now, many academics and scholars have agreed to perceive poverty in a multidimensional perspective, where human deprivation is analysed in terms of shortfalls from the minimum levels of basic needs themselves, rather than income as an intermediary of basic needs (Tsui, 2002:70). The multidimensional analysis of poverty established a clear breakthrough in treating the traditional concept of poverty (Fusco, 2003:3).

Theoretically, this approach provides a more inclusive definition of poverty. In this sense, poverty is understood not only as a shortfall in income, but more largely as deprivation in numerous life domains. These involve financial difficulties, basic needs, housing conditions, durables, health, social contacts, participation and life satisfaction (D'Ambrosio *et al.*, 2011:951). As there is unanimous agreement on the definition of poverty as multidimensional aspects, the index synthesizing all information about the poor population (Bibi, 2003:1) seems to be controversial. Less agreement exists on how information indicating the different aspects of poverty should be aggregated, to produce a global measure of poverty and whether the measure should focus on the state of those who are poor, according to all dimensions simultaneously, or according to a shortfall in only one dimension (Bibi, 2003:32-33; Lugo & Maasoumi, 2008:2).

Numerous methodologies for multidimensional poverty measurement have been suggested. The present study will stress four major approaches (a fuzzy set approach, a distance function approach, an information theory approach and axiomatic derivations of multi-dimensional poverty indices), looking at the actual derivation of multidimensional poverty indices (Deutsch & Silber, 2005). The axiomatic approach will be used in this study, as it is the most appropriate approach for its rationale. Therefore, the other three approaches will be briefly discussed before focusing on a more detailed discussion of the axiomatic approach.

2.5.2.1 The “fuzzy set” approach to poverty analysis

The theory of fuzzy set approach was first conceptualised by Lotfi A. Zadeh. It is founded on the consideration that some classes of objects may not be precisely defined by criteria of membership (Zadeh, 1965:338). While it is always possible to determine for certain objects if they belong to a given set or not, there might be the case of some objects where one is unable to decide which object belongs to a certain set and which do not. Therefore, these objects are considered to form a certain fuzzy subset. The fuzzy sets concept gives an ideal framework to deal with the case of absence of precise criterion for determining which object belongs, or does not, to a certain set (Miceli, 1998:5). Looking at the notion of vagueness of poverty (Quizilbash, 2003), already discussed in section 2.3.2 of this chapter, it appears appropriate to model the vague concept of poverty using the fuzzy set approach. Sen (1981:13) maintained that poverty and well-being concepts can be vague or inexact and he (Sen, 1989:317-318) suggested that, to address this vagueness or inexactness, the fuzzy set theory and incomplete orderings are relevant methods to be used.

It is also argued that there are possibly a range of living standards, from the poor to the rich, that renders any cut-off point somewhat arbitrary (Mack & Lansley, 1985:41). With this approach, it is not required to indicate an arbitrary poverty line, as may be necessary when defining poverty using headcount ratio. The logic behind the fuzzy set approach to poverty analysis is that, in some instances, a person in a certain state of deprivation would be certainly regarded as poor, whereas in others his/her level of welfare is high enough so that she/he should be regarded as non-poor (D'Ambrosio *et al.*, 2011:952). There would be persons for whom such a categorisation is not that clear. This is particularly valid when considering the multidimensional approach to poverty measurement, since different criteria are used to identify who is poor. One would be considered poor, according to some criteria, while others would define the same person as non-poor. The fuzzy set approach would attribute those persons various degrees of membership of the set of the poor.

Suppose $x \in X$ be any element of a set X and $A \in X$ being a fuzzy subset of X . $A = \{x, \lambda_A(x)\} \forall x \in X$ is characterised by a membership function $\lambda_A(x) \rightarrow R \in [0,1]$ indicating the degree of membership of element x to the fuzzy set A . Applying this mathematical exposition to poverty measurement, suppose that X is a set of n individuals i ($i= 1, \dots, n$) and A a fuzzy subset of X , the set of poor people. In the fuzzy approach $\lambda_A(x_i)$ the membership function of the poor set (of individual i) is defined as:

$\lambda_A(x_i)=0$, if individual x is absolutely non-poor,

$\lambda_A(x_i)=1$, if individual x completely belongs to the poor set, and

$0 < \lambda_A(x_i) < 1$, if individual i reveals a partial membership of the poor set

The key concern here is to determine the membership function $\lambda_A(x_i)$ of the individual. In the literature, the fuzzy approach to poverty analysis has taken different forms. In their empirical application fuzzy set approach to poverty, Cerioli and Zani (1990) developed a fuzzy theoretical model to multidimensional poverty analysis, named the Totally Fuzzy Approach. The idea was to consider a whole range of variables (attributes) that are presumed to each measure a specific aspect of poverty. Cheli and Lemmi (1995) later extended the Totally Fuzzy Approach by deriving the deprivation indices directly from the distribution function of the attributes measured. This method is known as the Totally Fuzzy and Relative (TFR) method.

Contrasting the traditional methods, the fuzzy measure does not dichotomise the population into non-poor and poor via an arbitrary poverty line. It allows the restriction of targeting errors related to the drastic differentiation between the poor and the non-poor, especially between those who share the same circumstances but who just happen to be placed on opposite sides of a poverty line (Makdissi & Wodon, 2004:42). However, it does not remove the possibility of differences in value judgements on poverty. Although the membership function, is not completely arbitrary, two analysts may use two different membership functions since they characterise distinct beliefs on who is poor on the part of the analyst. One can conclude that this approach does not entirely address the issue of arbitrariness.

Even though it is not the arbitrariness in defining the poverty line or cut-off, the arbitrariness lies in the specification of the precise boundaries of the imprecise borderline (Qizilbash & Clark, 2005:1-2). Therefore, in terms of empirical application of this approach, the very advantage of this approach shares the same root with its disadvantage, where the impreciseness makes poverty comparisons very problematic. This is the most important motive why the analysis of the current study did not undertake the fuzzy set approach.

2.5.2.2 The distance function approach

The distance function is a concept widely used in efficiency analysis, particularly in production economics, as a mean of summarising the series of information deriving from the multi-output nature of production into merely one dimension (Coelli *et al.*, 1998).

Distance functions can be differentiated according to their input or output orientation. Intuitively, the output distance function $D_{out}(x,y)$ measures the extent to which an output vector $y \in R_{++}^M$ can be proportionally increased, given a fixed input vector $x \in R_{++}^N$ (Rippin, 2009:10). Let $P(x)$ be defined as the output set of all output vectors y which can be produced by the input vector x . The production possibility frontier $PPF(x)$ shows the maximum among the output combinations, which can be produced given input vector x . The distance function for a particular output combination measures the distance between this combination and the $PPF(x)$ as the inverse of the factor by which the production could be increased for a given input vector x , that is:

$$D_{out}(x,y) = \min\{\theta: (y/\theta) \in P(x)\} \quad (2.4)$$

Where θ is a scalar measuring the distance to $PPF(x)$ (Rippin, 2009:11).

Likewise, the input distance function $D_{in} = (x,y)$ measures the extent to which an input vector $x \in R_{++}^N$ can be proportionally contracted given a fixed output vector $y \in R_{++}^M$. Let $L(y)$ be defined as the input set of all input vectors x which can produce the output vector y . The isoquant $IQ(y)$ represents the minimum among the input

combinations which can generate a certain output vector y . The distance function for a specific input combination measures the distance between this combination and the $IQ(y)$ as the inverse of the factor by which the input quantities could be reduced for a given output vector y , that is:

$$D_{in}(x, y) = \max\{\rho: (x/\rho) \in L(y)\} \quad (2.5)$$

Where ρ is a scalar measuring the distance to $IQ(y)$ (Rippin, 2009:11).

Generally, the defined concept is the same as the one that concerns efficiency and productivity analysis, where the main focus lies in determining differences between the amounts of a set of inputs used to generate a given amount of output (Ramos & Silber, 2005:289). Similarly, in the context of well-being measurements one can include all the relevant dimensions into an index, which estimates the extent of well-being experienced by each person (Ramos, 2005:3). Rippin (2009:11) and Ramos (2005:3) pointed out that the function distance approach shares the similar methodological trend to the analysis of well-being, where both approaches attempt to summarise or collapse a whole lot of information deriving from a multidimensional phenomenon into one single dimension. In other words, the distance function approach indirectly aggregates the different attributes of a person into a single cardinal index, with person i considered poor if his/her aggregate index falls short of a certain selected threshold (poverty line). In doing so, any assumptions regarding prices or behaviour is not required in this approach (Rippin, 2009:11). This is indeed an important and desirable property when considering poverty measurements.

The distance functions approach has, however, been rarely used when it comes to its application in analysing household behaviour (Deutsch & Silber, 20005:151). Lovell *et al.* (1994) were the first to apply this approach, by assessing the quality of life, living standards and the efficiency in converting resources into *functionings* of population in Australia. The living standards were determined by a basket of multiple resources/commodities through an index similar to the input quantity index of production economics, while the quality of life was evaluated by an index of individual *functionings* corresponding to the output quantity index of production

economics (Deutch & Silber, 2005:154; Ramos & Silber, 2005:286). This approach is strictly restrictive in the way that it generalises the multidimensional nature of poverty into the simple, income-based approach, by using a wider concept of income. Because of the nature and underlying purpose of this study, this method cannot be followed in this thesis.

2.5.2.3 The information theory approach

The information theory is borrowed from engineers in the field of communication and Theil (1967) was possibly the first one to relate this concept to economics theories (Deutsch & Silber, 2005:155). Cover and Thomas (2006:1) viewed the information theory as follows: “information theory answers two fundamental questions in communication theory: What is the ultimate data compression (answer: the entropy H), and what is the ultimate transmission rate of communication (answer: the channel capacity C)”. In inequality and poverty measurement, there is a particular and extremely valuable result regarding the entropy: two entropies are equal if, and only if, underlying distributions are identical. Thus, “the basic measure of divergence between two distributions is the difference between their entropies” (Maasoumi & Lugo 2006:9). Maasoumi (1986) was the first to borrow this concept and use it in defining multidimensional measures in well-being and inequality in well-being. The subsequent studies built on Maasoumi’s (1986), to measure multidimensional poverty (Miceli, 1997; Deuth & Silber, 2005; Naidoo, 2007).

Call $x_{ij} \in X$ the value taken by indicator j ($j=1,...,k$) for individual i ($i= 1,...,n$). Maasoumi’s opinion is to replace the k pieces of information on the values of the various indicators for the different individuals by a composite index x_{ic} which will be a vector of n components, one for each individual (Silber, 2007:47). In other words, each vector of attributes $(x_{i1},...,x_{ik})$ is aggregated into a single scalar x_{ic} . Individual i will be considered as poor at any time his/her scalar x_{ic} falls below a predefined poverty line. In order to select the aggregated function that would allow generating a composite welfare index x_{ic} , Maasoumi (1986) proposed the use of a vector $x_c=(x_{1c},...,x_{nc})$ that would be the closest to the various m vectors x_{ij} providing the welfare level the various individuals derive from these m indicators.

To define such 'proximity' Maasoumi (1986), referred to the information theory and suggested a class of generalized divergence measures that fit in the multidimensional case and that are expressed as follows:

$$D_{\gamma}(x_c, X, \alpha) = \begin{cases} 1/(\gamma(\gamma + 1)) \sum_{j=1}^m \alpha_j \{ \sum_{i=1}^m x_{ic} [(x_{ic}/x_{ij})] \} & \text{when } \gamma \neq 0, 1 \\ \sum_{j=1}^m \alpha_j [\sum_{i=1}^m x_{ic} \log(x_{ic}/x_{ij})] & \text{when } \gamma \rightarrow 0 \\ \sum_{j=1}^m \alpha_j [\sum_{i=1}^m x_{ij} \log(x_{ij}/x_{ic})] & \text{when } \gamma \rightarrow 1 \end{cases} \quad (2.6)$$

The minimisation of this class of proximity measures then lead to the desired composite indices x_{ic}

$$x_{ic} \alpha \begin{cases} [\sum_{j=1}^m \delta_j (x_{ij})^{-\gamma}]^{-(1/\gamma)} & \text{when } \gamma \neq 0, -1 \quad (\text{harmonic mean}) \\ [\prod_{j=1}^m (x_{ij})^{\delta_j}] & \text{when } \gamma \rightarrow 0 \quad (\text{geometric mean}) \\ [\sum_{j=1}^m \delta_j (x_{ij})] & \text{when } \gamma \rightarrow 1 \quad (\text{arithmetic mean}) \end{cases} \quad (2.7)$$

Where $\delta_j = \alpha_j / \sum_{j=1}^m \alpha_j$ (Rippin, 2009:13)

It turns out that the composite indicator x_c is a weighted (harmonic, geometric or arithmetic) mean of the different indicators.

What remains to be selected are the weights δ_j , γ and the corresponding poverty line, which is commonly defined as being equal to some percentage of the median value of the composite indicator x_c (D'Ambrosio, 2005:953). This method of identification is similar to the distance function approach, where poor are recognised after respective endowments have been aggregated, that is, reducing the multidimensionality of poverty to a simple generalisation of the income approach. The information theory approach has the potential to be easily used as an add-on in almost all poverty measurements. Maasoumi and Lugo (2006:15) explained that the information theory methods are able to reveal the meaning and the working multidimensional framework when one allows compensation to an individual/household from the above threshold attributes for those attributes that fall short.

2.5.2.4 Axiomatic derivations of multidimensional poverty Indices

In his famous 1976 article, Sen blamed the head count ratio and poverty gap indices for being insensitive to the distribution of income among the poor (Sen, 1976:219). Using the axiomatic approach, Sen (1976) proposed a more sophisticated poverty index, satisfying a number of desirable axioms. The axiomatic approach to the measurement of poverty sets out the axioms (a set of desirable and ethically defensible properties) against which a poverty index should be judged (Xu & Osberg, 2001:155). The list of axioms which reasonable poverty indices should satisfy devised by Sen (1976), has later stimulated interest in the derivation of axiomatic multidimensional indices of poverty. It is revealed that only a few studies have attempted to axiomatically derive multidimensional poverty measures (Alkire & Foster, 2011b; Bossert *et al.*, 2009; Bourguignon & Chakravarty, 2003; Chakravarty *et al.*, 1998; Chakravarty & D'Ambrosio, 2006; Chakravarty & Silber, 2008; Tsui, 2002). Each of these studies defined different axioms and combined them in various ways, so that different classes of multidimensional poverty measures can be developed. However, the present study only discusses the one that is implemented in this investigation (Alkire and Foster class of multidimensional measurements).

The general framework provided by the Alkire and Foster methodology was inspired by Sen's capability approach (Alkire & Santos, 2013a:246). This approach suggests an important shift in the emphasis of means of living towards the actual freedoms an individual has (Sen, 2009:253). Alkire and Santos (2013a:240) maintain that through the Multidimensional Poverty Index, the methodology suggested by Alkire and Foster (2011a; 2011b) remains the one which has been empirically applied to the largest scale, either internationally (Alkire & Santos, 2010) or as national multidimensional poverty measurements developed by countries (among others, Colombia, Bhutan, Pakistan and, recently, South Africa, in its report of 2014). In the following subsections, the classes of the multidimensional poverty measures of Alkire and Foster are discussed. Their main advantages and limitations are highlighted. An overview of a series of axioms that this method satisfy is provided along with the discussion.

In the view of Sen (1976:219), poverty measurement has to address two important steps: identification of who is poor among the population and the aggregation of information about poverty across society. These two basic steps have become the standard conceptual framework for poverty measurement (Alkire & Foster, 2011a:290). They were considered in Alkire and Foster's methodology of measuring poverty. The identification of the poor is based on counting the number of (weighted) deprivations and identifying the poor using 'dual cut-off' method, while the aggregation method extends the existing unidimensional FGT family of measures towards the multidimensional context.

2.5.2.4.1 Identification

In unidimensional, income-based analysis, differentiating the poor from the rest of the population is relatively straightforward. It is generally carried out by the use of a threshold or poverty line, with poor individuals being identified as those whose level of resources (income or expenditure, in this case) fall below the poverty line. However, identifying the poor from the non-poor becomes a more complex exercise in the multidimensional measurement setting, where multiple variables are considered. From the capability approach perspective, a fundamental conceptual shortcoming of considering multidimensional poverty through a unidimensional lens is the loss of information on the dimension specific shortfalls (Alkire & Foster, 2011b:478). Aggregation before identification (as it is in most monetary poverty lines) converts dimensional attainments into one another, without considering deprivation cut-offs (Alkire & Foster, 2011b:478). The dimensions are independently assessed and certain dimensional deprivations are inherently undesirable. In this case there are convincing reasons to look further, beyond a unidimensional approach to identification methods that concentrate on dimensional shortfalls. The identification method of Alkire and Foster methodology is discussed, based on Alkire and Foster (2011b) and Batana (2008).

When multiple dimensions are taken into account, distributional data are presented in the form of $n \times d$ matrix X^{nd} of achievements, where element x_{ij} is the achievement of individual i ($i=1, \dots, n$) in indicator j ($j=1, \dots, d$). x is as follows:

$$x = \begin{bmatrix} x_{11} & \cdot & x_{1j} & \cdot & x_{1d} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ x_{i1} & \cdot & x_{ij} & \cdot & x_{id} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ x_{n1} & \cdot & x_{nj} & \cdot & x_{nd} \end{bmatrix} \quad (2.9)$$

As the most of axiomatically derived multidimensional poverty measures, the AF methodology follows the counting approach in the identification step (Alkire & Santos, 2013a:240). In counting approaches, a deprivation cut-off for each used indicator is defined, in order to indicate a normative minimum level of attainment required to be non-deprived (Alkire & Santos, 2013a:240). Let z ($z_1, \dots, z_d$) be a row of vector of dimension-specific thresholds z_j (deprivation cut-offs). For each dimension there is a specific poverty line z_j in order to identify the individuals deprived in that particular dimension. Concerning the weight to be assigned to each indicator, the Alkire and Foster Methodology is flexible to assign equal or various weights to different dimensions depending upon their relative importance. They then have to be tested for robustness.

For clarity of the presentation, an example can be given where all dimensions are equally weighted (Batana, 2008). Assume that a matrix of deprivations $x^{\sim 0} = [x_{ij}^{\sim 0}]$ is resulting from x , as follows: for all i and j , $x^{\sim 0} = \begin{cases} 1 & \text{if } x_{ij} < z_j \\ 0 & \text{otherwise} \end{cases} \quad (2.10)$

This means that an individual i is identified as deprived in any single indicator j when her/his achievement x_{ij} is strictly less than the defined threshold z_j for that particular indicator. When the summation of each row is done, there is a presence of a new column vector c of deprivation sums having c_i as the number of deprivations suffered by individual i . This is the first cut-off, while the Alkire and Foster methodology is known as ‘dual cut-off’ method of identification, which follows two kinds of cut-off, as indicated by its name.

For recognising who really is poor, let the identification function be $\rho(x_i, z)$ such that:

$$\rho(x_i, z) = \begin{cases} 1 & \text{if individual } i \text{ is poor} \\ 0 & \text{otherwise} \end{cases} \quad (2.11)$$

Consider k to be the cut-off. An individual i is identified as poor when $\rho_k(x_i, z)=1$ or $c_i \geq k$. $\rho_k(x_i, z)$ is the identification function corresponding to the threshold k . Therefore, equation (2.11) can be written as follows:

$$\rho_k(x_i, z) = \mathbb{I}(c_i \geq k) = \begin{cases} 1 & \text{if } (c_i \geq k) \\ 0 & \text{otherwise} \end{cases} \quad (2.12)$$

$\mathbb{I}(c_i \geq k)$ stands for the standard indicator function which can get the value 1 if the expression in brackets stands and the value 0 for otherwise.

There is still a decision to be made in multidimensional context: among those who fall below the threshold in some dimension(s); who should be regarded as poor? What is the minimum number k of deprivations a person should experience to be regarded as poor? The starting point is the *union approach*, which considers a person as multidimensionally poor if that person falls short in only one dimension ($k=1$) (Atkinson, 2003:51). This method may be too inclusive and may overestimate the poverty if the number of dimension d is large (Alkire & Foster, 2007:8). Likewise, an individual may be deprived in one or other dimension for some other reasons (such as beliefs, preference and norms) than the lack of opportunity (Basarir, 2009:5; Alkire & Santos, 2013a:242). As a result, a union method may not be useful to discern and target the most highly deprived. This is the approach that is used in the HPI, the UNDP's index that assesses poverty using three dimensions, including health, education and income (Basarir, 2009:5).

The other end of the spectrum is the *intersection approach*, which considers an individual as poor if he/she is poor in all dimensions ($k=d$) (Atkinson, 2003:51). Inversely to the union approach, this identification method is too strict and it generally generates low estimates of poverty, but is expected to detect the most indigent people. It certainly fails to notice individuals who are facing extensive, but not universal deprivation (i.e. a healthy homeless person). This may conclude by considering a person who extensively suffers multiple deprivations as non-poor. Bresson (2009:2) and Lugo and Maasoumi (2009:25) claimed that *union* and *intersection criteria* to the identification of poverty appear to be too rigid for most cases. This shows a need for determining a different number of dimensions k (cut-

off) in which someone is deprived on to be regarded as multidimensionally poor. The Alkire and Foster (2011b) measure suggests selecting the second cut-off k to be any value between one (the *union approach* $k=1$) and the maximum number of dimensions d (the *intersection approach* $k=d$). In other words, the identification point lies somewhere in the middle, between the two extremes $1 < k < d$. Thus, ρ_k depends on both the indicators' cut-offs z_j and the poverty cut-off k , and that is where the Alkire and Foster methodology gets to be called 'a dual cut-off method of identification'.

2.5.2.4.2 Aggregation

In his seminal article, Sen (1976:219) indicated that the head count ratio does not satisfy the core axioms, including monotonicity and transfer. In a multidimensional context, the issue of monotonicity is addressed where, for a poor individual, a new deprivation in a previously non-deprived indicator should increase the overall poverty level. H indicates the incidence of poverty, but does not satisfy the monotonicity, dimensional monotonicity or deprivation severity axioms.

Consider q_k as the number of the poor identified according to the thresholds vector z and the cut-off k . This means that the headcount ratio H will be as follows:

$$H = q_k / n \quad (2.13)$$

where $q_k = \sum_{i=1}^n \rho_k(x_i, z) = \sum_{i=1}^n \mathbb{I}(c_i \geq k)$

If a poor individual suffers a deprivation in a new dimension, the headcount ratio H stays unchanged. This implies that the axiom of dimensional monotonicity is violated. The dimensional monotonicity states that if poor individual i becomes newly deprived in an additional dimension, this should increase the overall poverty level. Moreover, H cannot be broken down to reveal how much each dimension contributes to poverty (Alkire & Foster, 2011b:479). To overcome these drawbacks, Alkire & Foster (2011b:479) decided to add information on the breadth of deprivation suffered by the poor.

The *share of possible deprivations* suffered by a poor individual i is provided by:

$$\bar{c}_i(k) = \frac{1}{d} [c_i \rho_k(x_i, z)], \quad (2.14)$$

while the *average deprivation share* across the poor will be given by:

$$A = \frac{1}{q_k d} \sum_{i=1}^n c_i \rho_k(x_i, z) \quad (2.15)$$

The *adjusted headcount ratio* M_0 indicates not only the incidence but also the breadth of poverty (Alkire & Foster, 2011b:479; 2011a:299; Alkire & Santos, 2013a:244; Alkire & Seth, 2009:12).

$$M_0 = HA = \frac{1}{nd} \sum_{i=1}^n c_i \rho_k(x_i, z) \quad (2.16)$$

Looking at the equation (2.16), it is certain that if an individual i suffers an additional dimension, A will increase and so will M_0 . Thus M_0 satisfies the dimensional monotonicity. M_0 can be used when selected indicators are purely ordinal, categorical or dichotomous (Alkire & Foster, 2011b:479, Alkire & Santos, 2013a:244). This is mostly the kind of data used in multidimensional approaches based on capabilities. The values of ordinal indicators do not have cardinal meaning. They are merely ranked as birth order or self-assessed health. Alkire and Santos (2013a:244) reasoned that there is no single method that can convert into cardinal distances between the different categories. Categorical indicators do not have cardinal values, but they can be clustered into groups showing adequacy or deprivation (such as water source, roof materials, sanitation facilities or occupational category). By dichotomizing all the variables into deprived and non-deprived categories, the M_0 measure combines the indicators in a robust way. In this case, robust indicates the point that the M_0 measure does not vary under any monotonic transformation of the scale of any of the indicators and the corresponding deprivation threshold (Alkire & Santos, 2013a:244).

The M_0 indicates only the extent and intensity of poverty, but it does not use any dimension-specific information on the depth of deprivation. As result, it violates the traditional monotonicity condition that poverty should increase as a poor individual suffers more deprivation in any given dimension. Alkire & Foster (2011a:279)

developed a class of adjusted FGT measures that are sensitive to the depth of deprivation when all indicators are represented by cardinal data. In this instance, a matrix $\hat{y}^1$ will be constructed deriving from $x^{\sim 0}$ by replacing 1 by the respective normalised gaps $g_{ij}^1 = \frac{z_j - x_{ij}}{z_j}$ for all cardinal data j and for all individual i . When G is considered as the average poverty gap across all cases in which poor individuals are deprived, then

$$G^1 = \frac{1}{\sum_{i=1}^n c_i \rho_k} \sum_{j=1}^d \sum_{i=1}^n g_{ij}^1 \rho_k(x_i, z) \quad (2.17)$$

The *adjusted poverty gap* M_1 , which is described as the weighted average of indicator-specific poverty gaps, is therefore calculated as follows:

$$M_1 = HAG = \frac{1}{nd} \sum_{j=1}^d \sum_{i=1}^n g_{ij}^1 \rho_k(x_i, z) \quad (2.18)$$

In addition to being sensitive to the number of deprivations suffered by the poor, M_1 takes into account their depth. For example, whenever a poor individual becomes more deprived in a specific indicator, M_1 increases. If the shortfall from the deprivation threshold in any indicator is diminished, then poverty decreases, even though that individual continues to be poor. However, as far as inequality among the poor is concerned, the M_1 is not able to capture any impact of increase or decrease in the number of deprivations among the poor.

Replacing G by S the severity of deprivations among the poor or the average squared poverty gap among the poor in equation (2.18), the measure obtained is the *adjusted squared poverty gap* M_2 .

$$S = \frac{1}{\sum_{i=1}^n c_i \rho_k} \sum_{j=1}^d \sum_{i=1}^n g_{ij}^2 \rho_k(x_i, z) \quad (2.19)$$

$$\text{Then, } M_2 = HAS = \frac{1}{nd} \sum_{j=1}^d \sum_{i=1}^n g_{ij}^2 \rho_k(x_i, z) \quad (2.20)$$

The adjusted squared poverty gap M_2 measure is sensitive to the number of deprivations the poor suffer, the depth of the deprivations, and to the inequality of deprivations among the poor.

This class of multidimensional measures of Alkire and Foster clearly shows a trend, which can be generalised as simply the *adjusted FGT class of multidimensional poverty measures* M_α .

$$M_\alpha = \frac{1}{nd} \sum_{j=1}^d \sum_{i=1}^n g_{ij}^\alpha \rho_k(x_i, z) \text{ with } \alpha \geq 0 \quad (2.21)$$

Where $\alpha=0$ for M_0 the *adjusted headcount ratio*, $\alpha=1$ in the case of M_1 *adjusted poverty gap* and $\alpha=2$ in the case of M_2 the *adjusted squared poverty gap*.

2.5.2.4.3 The weights

Besides identification and aggregation, in multidimensional poverty measurement another critical challenge is how to assign weight to different dimensions. The *weights* or *deprivation values* are used to show the corresponding importance of the various deprivations. If all deprivations are perceived to have equal importance and are therefore equally weighted, this leads to a standard case where all weights are one and sum to the number of dimensions d . In several other instances, certain dimensions are judged to have more importance than others and therefore obtain a relatively higher weight. This case is shown by a vector whose entries sum to d but can change from one, with higher weights reflecting greater importance. The identification of the poor is affected by the deprivation values, since they establish the minimum combinations of deprivations that will classify an individual as being poor. The aggregation step is also affected where the relative contributions of deprivations to overall poverty vary (Alkire & Foster, 2011a:295-296).

2.5.2.4.4 Insights into, and limitations of, the Alkire and Foster method

For multidimensional poverty measurement, the Alkire and Foster methodology presents a flexible framework which acknowledges a series of identification criteria to be applied on the basis of counting the deprivations individuals suffer in the way that emphasis can be directed to those showing coupled or simultaneous deprivations. The parametric family of measures of Alkire and Foster does not violate a range of desirable properties which subgroup decomposability and dimensional breakdown among others are especially convenient. This is simple to compute (Alkire & Santos, 2013a:246). Every measure is composed of intuitive partial indices including poverty

incidence, average intensity and average poverty gap (Alikre & Santos, 2013a:246). Apart from considering more than one single indicator, poverty is fundamentally measured in a multidimensional way, because shortfalls in every selected indicator enter the measure, and every deprivation gets an independent acknowledgement as being “inherently undesirable” (Alkire & Foster, 2011b:478).

Many alleged drawbacks to the Alkire and Foster methodology were said to be misunderstandings as was clarified by Alkire and Foster (2011a) in their article entitled ‘Understandings and misunderstandings of multidimensional poverty measurement’. This criticism was that:

- The Alkire and Foster methodology does not add value over marginal data arrays. However, through the identification step, which is established on the experience of simultaneous deprivations, it does;
- It loses information by generating one overall number. The fundamental novelty is that the overall number is related to a set of consistent partial indices which indicate how much every indicator has contributed, the total contribution, and the contribution of the headcount ratio;
- It is too sensitive to weights. Yet this criticism was not supported by empirical results of robustness tests of the studies which used the same methodology (Alkire & Santos 2010, 2013b; Alkire *et al.*, 2010); and
- The requirement that indicators are available for the same household is too demanding. There is however, growing availability of data the household level, which is shown by voluminous published papers and reports using this methodology.

2.5.2.4.5 Alkire and Foster methodology compared with the MPI and UNDP’s indices (HDI and HPI)

The Alkire and Foster methodology is a general structure for multidimensional poverty measurement, which can be implemented in various ways. The dimensions and cut-offs could vary and so do the weights and poverty cut-off (Alkire & Foster, 2011a:306). This methodology can be implemented at various levels including community or national levels (Alkire & Foster, 2011a:306). The choice of measures

could vary where some would use cardinal data to measure the depth (M_1) or severity of poverty (M_2), while for others, ordinal data would be the only one available and so would describe M_0 and the intensity of poverty.

One example of the Alkire and Foster methodology is the Multidimensional Poverty Index (MPI), which is seen now in numerous studies (Alkire & Santos, 2010, Alkire & Santos, 2013b; Alkire *et al.*, 2015; UNDP, 2010). Based on a set of 10 indicators, MPI applied M_0 for 109 developing countries (approximately 78% of the world's population), following the availability of internationally comparable data in Alkire & Santos's (2010) study. Poor people were identified relatively to the attainment of household members. The cut-offs applied in MPI were roughly related to international benchmarks, mostly MDGs. The MPI has the same three dimensions as the Human Development Index (HDI), that is, education, health and standard of living. As aforementioned, the former measures poverty using 10 indicators, while the latter uses four indicators. In MPI, all three dimensions are equally weighed and indicators within dimensions are also equally weighted. A household is identified as multidimensionally poor if, and only if, it is deprived in some combination of indicators whose weighted sum is 30% or more of the dimensions (Alkire & Santos, 2010:7).

Although the HDI has similar dimensions as the MPI, they differ significantly. In measuring poverty, the AF methodology (and its example of the MPI) identifies poor from non-poor and solely concentrates on data of poor, while ignoring the non-poor (Alkire & Foster, 2011a:307). The HDI, first used in the Human Development Report (HDR) in 1990 (UNDP, 1990), is a welfare index constructed on three marginal distributions that combine into one overall, the aggregate dimensional attainments of all individuals (both poor and non-poor). The MPI offers a considerable detailed background of the extent and breadth of deprivations. In 2010, the UNDP, in co-operation with the Oxford Poverty and Human Development Initiative (OPHI) (based in the United Kingdom), introduced the MPI as a replacement for and improvement on the Human Poverty Index (HPI), which have been published since 1997. This HPI retained the similar three dimensions, but defined the indicators in a different way. The HPI could not identify overlapping deprivations as the MPI does. However, in the

MPI, each household has its specific profile of multidimensional poverty, which could be broken down indicator-wise to indicate what composes multidimensional poverty among various population sub-groups (such as gender, race group or ethnic group) or regions, with convenient implications for policy directly addressing the interlocking deprivations suffered by poor individuals. This instrument could be utilised to target the poorest more efficiently, evaluate the impact of programmes and monitor the progress of MDGs.

Both the HDI and the HPI have been criticised for ignoring additional dimensions and indicators, including those recognised by human rights or the MDGs (Alkire & Santos, 2010:12). They are also alleged to be limited in terms of data, dimensions and methodology. However, these indices made it possible for other kinds of multidimensional measures (including poverty measures) to be envisaged.

2.6 SUMMARY AND CONCLUSION

Poverty is a much-contested concept and its definitions are debatable. While there is unanimous agreement on the alleviation of poverty as the main challenge of the international community, the meaning in conceptual terms of poverty, how to measure it and to monitor its reduction, remain uncertain. A more crucial concern is whether income deprivation is the most appropriate benchmark to assess poverty, or should it be supplemented by other indicators. The widespread agreement emphasises that poverty is a multidimensional phenomenon, rather than a question of income-consumption, which has been extensively studied in the past. Human deprivation is analysed in terms of shortfalls from the minimum levels of basic needs themselves, rather than income as an intermediary of basic needs when poverty is viewed in multidimensional perspective. In this sense, poverty is understood not only as a shortfall of income, but more largely as deprivation in numerous life domains, including financial difficulties, basic needs, housing conditions, durables, health, social contacts, participation and life satisfaction.

In general, any definition of poverty contains a certain level of welfare, below which an individual must fall to be considered as poor. In other words, poverty is a

pronounced deprivation in well-being. There are numerous contesting approaches to poverty and welfare definition and assessments; but the most important are the welfarist and the non-welfarist approaches. Welfarists stress the existence of market imperfections and incompleteness and the lack of perfect correlation between relevant dimensions of well-being, which directs the attention towards a single indicator, such as income, rather unsatisfactorily. Non-welfarists emphasise the necessity of directing the emphasis away from the narrower space of utilities to a wider space, where multiple dimensions are both instrumentally and intrinsically crucial. Several non-welfarist approaches have consistently contested the prevalent paradigm (welfarist approach). The well-known non-welfarist approaches are the basic needs approach and Sen's capability approach. The former stresses consumption, whereas the latter emphasises an individual's values and choices. As a result, the non-welfarist approaches lead to distinct anti-poverty policies.

There is ample literature in how best to measure poverty. Poverty may be represented by a unidimensional indicator (income/consumption) or a multidimensional approach (such as living standards, health conditions and education). For a long time, policy-makers worldwide have embraced a unidimensional perspective of poverty, where poverty is defined on a single monetary indicator for standards of living. The assumption was that the level of income or its proxy consumption could describe accurately if individuals are able to achieve certain minimum thresholds on various dimensions, such as nutrition, clothing and housing.

Some of the most important contributions of unidimensional measures are the FGT measures and the Sen Index. The FGT poverty measurements are a family of three indices, namely headcount index, poverty gap index and squared poverty gap. The headcount index (P0), or incidence of poverty, identifies the proportion of population whose income is less than the poverty line. The poverty gap index measures the amount of income by which each person falls below the poverty line, while squared poverty gap describes the severity of poverty. The Sen Index sought to combine the effects of the number of poor, the depth of their poverty and the distribution of poverty within the group. The fundamental and severe limitation of

Income/consumption-based measures is how they assign weights of zero to the potential dimensions of poverty and one weight to a single dimension (income/consumption). Income is merely a means to ends. The ends are valuable than the means. It can be expected that a person with a reasonable consumption budget or higher income may be able to enhance the position of a number of his/her monetary and non-monetary attributes. However, some indispensable needs may not be satisfied because the markets might not exist.

The multidimensional analysis of poverty established a clear breakthrough in treating the traditional concept of poverty. Less agreement exists about how information indicating the different aspects of poverty should be aggregated to produce a global measure of poverty and whether the measure should focus on the state of those who are poor according to all dimensions simultaneously, or according to a shortfall in only one dimension. Numerous methodologies for multidimensional poverty measurement have been suggested, including a fuzzy set approach, a distance function approach, an information theory approach and axiomatic derivations of multi-dimensional poverty indices.

The logic behind the fuzzy set approach to poverty analysis is that, in some instances, a person in a certain state of deprivation would be certainly regarded as poor, whereas in others his/her level of welfare is high enough so that he or she should be regarded as non-poor. This is particularly valid when considering the multidimensional approach to poverty measurement, since different criteria are taken into account in order to identify who is poor. The fuzzy set approach would attribute those persons various degrees of membership of the set of the poor. Even though this approach does not suffer from arbitrariness in defining the poverty line, the arbitrariness lies in the specification of the precise boundaries of the imprecise borderline.

The distance function is a concept widely used in efficiency analysis, particularly in production economics, as a means to summarize the information deriving from the multi-output nature of production into just one dimension. Similarly, in the context of

well-being measurements, one can include all the relevant dimensions into an index which estimates the extent of well-being experienced by each person.

The information theory answers two fundamental questions in communication theory: what is the ultimate data compression (answer: the entropy H) and what is the ultimate transmission rate of communication (answer: the channel capacity C). In inequality and poverty measurement, there is a particular and extremely valuable result regarding the entropy: two entropies are equal if, and only if, underlying distributions are identical. The basic measure of divergence between two distributions is thus the difference between their entropies. The information theory methods are able to reveal the meaning and the working multidimensional framework when one allows compensation to an individual/household from the above threshold attributes for those attributes that fall short. However, this method of identification is similar to the distance function approach, where the poor are recognised after respective endowments have been aggregated. This reduces the multidimensionality of poverty to a simple generalisation of the income approach.

The axiomatic approach to the measurement of poverty sets out the axioms against which a poverty index should be judged. The methodology of Alkire and Foster methodology was discussed in this chapter as one of axiomatic approaches to the measurement of poverty. Their methodology follows two basic standard conceptual framework steps for poverty measurement, namely, identification and aggregation. The identification of the poor is based on counting the number of (weighted) deprivations and identifying the poor using 'dual cut-off' method, where there is a specific poverty line for each indicator in order to identify the individuals deprived in that particular dimension. To identify who is multidimensionally poor, the methodology of Alkire and Foster nominates the second cut-off to be any value between one (the union approach) and the maximum number of dimensions (the intersection approach). The aggregation method extends the existing unidimensional FGT family of measures towards the multidimensional context. The adjusted FGT family of measures comprises the adjusted headcount ratio, adjusted poverty gap and the adjusted squared poverty gap. The adjusted headcount indicates not only the incidence (headcount ratio) but also the intensity of poverty while the adjusted

poverty gap indicates the incidence, breadth and depth of poverty. The adjusted squared poverty gap measure is sensitive to the number of deprivations the poor suffer, the depth of the deprivations and to the inequality of deprivations among the poor. The parametric family of measures of Alkire and Foster does not violate a range of desirable properties which subgroup decomposability and dimensional breakdown, among others, are especially convenient.

Based on this chapter, which explored the theoretical background of poverty, emphasising poverty viewed in a multidimensional perspective, chapter 3 discusses how these theories have been applied in South Africa.

CHAPTER 3: OVERVIEW OF POVERTY RESEARCH IN SOUTH AFRICA

3.1 INTRODUCTION

Poverty has remained topical in international development policy efforts, particularly in the developing world. It is much more topical in the South Africa context, due to the legacy left by the apartheid system. One of the features of this system was a procedure of active dispossession, whereby assets, such as livestock and land, were confiscated from the majority African population (Carter & May, 1999:1; May & Norton, 1997:95; Seekings, 2007:2; Woolard, 2002:6). Opportunities to build up these assets, such as education, infrastructure and markets, were denied to them (Carter & May, 1999:1; May & Norton, 1997:95). Black South Africans faced restricted opportunities for employment or self-employment, were limited to low-quality health care, and were physically confined to impoverished areas of the countryside or cities (Seekings, 2007:2). Explaining the effect of apartheid's aggression towards the poor, Wilson and Ramphela (1989:204:230) recorded that a such system of intentional destitution marked the experience and dynamics of poverty in South Africa. On the contrary, the White minority benefited from discriminatory public policies (Seekings, 2007:2). As a result, developed white localities owned a *per capita* income similar to that of an upper-middle-income country, while the majority black people faced extreme poverty in terms of income and basic services, health facilities, educational opportunities and the right to choose one type of life or another.

South Africa is regarded as an 'upper-middle-income' country by The World Bank (World Bank, 2014). In terms of social indicators such as life expectancy, quality of education and infant mortality, however, South Africa is closer to countries of 'lower-middle-income' or even 'low-income' countries. A South African's life expectancy at birth in 2013 was 60 years, 17 years lower than that of Panama (upper-middle-income country), nine years lower than that of the Philippines (lower-middle-income country) and four years lower than that of Eritrea, a low-income country (WHO, 2015). In South Africa, a small percentage of people earn a very high income, which

sharply increases the overall average income of the country, but has less of an effect on HDI and other social indicators (Van Der Berg, 2011:120).

Since the genesis of the democratic dispensation, the South African government, in its development plan, has initiated a comprehensive anti-poverty policy stressing poverty alleviation and improvement of the quality of life for all South Africans. In general, it is speculated that from 2001 there has been some improvement in welfare, where poverty levels and depth of poverty are declining, but this does not seem to have attained the groups often termed 'the poorest of the poor' (children and women) (Leibbrandt *et al.*, 2010; MDG, 2013:29). How poverty is conceptualised considerably influences poverty profiling and policy guidance. The main concern here is to identify which conceptual approaches to poverty is appropriate for the particular case of South Africa. Poverty differs from one country to another. It is thus crucial to adapt the concept of poverty to the appropriate framework, as there is no conventional concept that can be accurately believed to embrace all countries at all times (Gordon & Spicker, 1999). The exploration of the meaning of poverty in the South African context is very important, to devise more effective poverty reduction strategies. In turn, this description can then be employed to reveal the extent, depth and intensity of the problem.

Various ways of conceptualising poverty in the South African context are introduced in the body of this chapter. These vary, from the historical subsistence understanding that associates poverty with a lack of resources required for the basic survival of an individual, to a broader understanding that acknowledges the multidimensionality nature of poverty. When endeavouring to tailor different poverty conceptualisations in the South African context, the existing arguments and trade-offs become alive (unidimensional vs. multidimensional poverty). This exercise includes the concept of inequality, as it is unavoidable to talk about poverty in South Africa without referring to inequality, due to its history.

3.2 POVERTY CONCEPTUALISATION IN THE SOUTH AFRICAN CONTEXT

Poverty conceptualisation, definition and measurement in a society appear to be a mirror-image of the standards of that society (SPII, 2007:5). The concept of poverty should be adapted according to the appropriate context, as there is no common concept that is believed to hold the meaning of poverty for all countries, at all times. Notwithstanding the fact that poverty exists, there is no unanimous agreement, thus far, concerning the meaning thereof. There is a multitude of definitions, measurements and policy recommendations by development analysts and institutions, concerning how to efficiently address this phenomenon. As discussed in the previous chapter, some of the frameworks to conceptualize poverty include the absolute against the relative approach and the unidimensional (i.e. monetary approach) against the multidimensional approach (i.e. capability approach).

The ways the concept of poverty is utilised by politicians, experts and citizens, hold very divergent and various roots in social, political and philosophical discourses (Meth, 2006:23-24). Nowadays, a debate on poverty pulls out multiple and sometimes conflicting underlying assumptions about what is needed for an individual in order to have a minimally human life, about the link between the have and the have-nots, about well-being, ill-being and suffering, about the obligations between individuals and society and about social life and individual agency (SPII, 2007:5). These fundamental discussions and narratives indicate that what was considered as an ordinary concept of poverty has inherent 'messiness' about it. Given this 'messiness', it is not possible to refer to any single 'scientific' understanding of poverty (Alcock, 1993:3).

It is very important to adopt appropriate concepts, definitions of poverty to the society in which they are applied. Sen (2004:78) stipulated that the sets of valued *functionings* should be derived from a genuinely deliberative discussions or public reasoning, so that significant individual's valued *functionings* could be revealed. Apart from the technical concepts and definitions of poverty discussed in the previous chapter, it is important to take into account the way the poor themselves

perceive poverty. This exercise was done by the South African Participatory Poverty Assessment (SA-PPA), in the Poverty and Inequality Report (PIR) in 1998. The SA-PPA found that the way poor people conceptualized and defined poverty differs from that of non-poor people. Poverty is apparent to the human eye and is profiled by shacks, homelessness, unemployment, casualised labour, poor infrastructure and lack of access to basic services (Triegaardt, 2006:2). According to Orshansky (1969:37), poverty, like beauty, lies in the eyes of the beholder.

While people who are not poor perceive poverty as a lack of income and a result of bad choices by the poor, during the SA-PPA (May *et al.*, 1998), poor people characterised their conditions as follows:

- ***Alienation from the community:*** This means that they are isolated from the institutions of kinship and community.
- ***Food insecurity:*** the inability to provide enough or good quality food for the family is perceived as an outcome of poverty.
- ***Crowded homes:*** The poor are perceived to live in crowded conditions and in homes in need of maintenance.
- ***Use of basic forms of energy:*** The poor lack access to safe and accessible sources of water and energy. In rural areas the poor, mostly the female, walk long distances to gather firewood and water, risking physical attack and sexual assault.
- ***Lack of adequately paid, secure jobs:*** Lack of employment opportunities, low wages and lack of job security is considered to be a main contributor to the population's poverty.
- ***Fragmentation of the family:*** Many poor households are characterised by absent fathers, or children living apart from their parents. Households may be split over a number of sites as a survival strategy.

Beside the aforementioned characteristics, poverty matters as it is the pre-eminent forecaster of the individual's future life trajectory. The negative effects of poverty tend to accumulate throughout a person's lifetime. A greater vulnerability derived from poverty tends to lead to a continuous exposure to a range of risks

(unemployment, ill health and disability), effectively trapping people and their dependants in a cycle of poverty. These become inter-generationally perpetuated (Taylor Committee, 2008:103-104).

3.3 HISTORICAL OVERVIEW OF POVERTY RESEARCH IN SOUTH AFRICA

The investigation of poverty levels among South Africans is not new. The poverty condition among the South African white population was founded in the First Carnegie Commission of Inquiry into Poverty, when investigating the “Poor White Problem” (Magasela, 2005). Almost from its establishment as the Union of South Africa in 1910, the country has been concerned with poverty problems among white people, long before the Carnegie Commission and some major poverty-related investigations were undertaken (Botha, 1956:159; Seekings, 2006). The Carnegie Commission of Investigation into the Poor White Question in South Africa started its work in 1929 and published the findings in a report known as the “Carnegie Poor White Study” in 1932 (Seekings, 2006:2). This report was subdivided into a set of five reports namely economic, psychological, educational, health and sociological reports (Seekings, 2006:2). The Commission distinctly recognised the multidimensional nature of poverty, even if they did not construct an index of multidimensional poverty. At that time, the report was the largest and most complex social science study ever conducted in Africa (Golden, 2004:4). More than a sociological investigation, this inquiry was to become a watershed event in South African social and political history (Golden, 2004:4).

This investigation was motivated by a visit to South Africa, in 1927, by the president and secretary of the foundation that had been created by the philanthropist, Andrew Carnegie, known as Carnegie Corporation, based in New York. It is after this visit of the two representatives of the Carnegie Corporation that individuals from different sides, including the Dutch Reformed Church, asked for support for an inquiry into the Poor White Problem (Vosloo, 2012:6). In addition to funding the major share of the costs, the Carnegie Corporation organised two prominent American sociologists to assist with the investigation (Grosskopf, 1932:i).

For many years after the First Carnegie Commission of Inquiry into Poverty, there had been no comprehensive study of poverty in South African, due to the fact that sanctions against South Africa's apartheid system had prevented The World Bank from performing any serious investigations into the economy of the country. Therefore apartheid's spin doctors had been able to uphold their statements that the country had a relatively strong economy and that the blacks African population was not as economically deprived as in to other areas of Africa (Columbia University, 2006).

Fifty years later, the Carnegie Corporate of New York sponsored the Second Carnegie Inquiry into Poverty and Development in Southern Africa. This time it was an all-encompassing inquiry in terms of the population studied (Lulat, 2008:xlvi). Unlike its predecessor, which was limited to the white population, the second study examined the effects of poverty in all groups residing within the southern African region, including Botswana, Lesotho and Namibia (Golden, 2004:11). In this Second Carnegie Commission of Inquiry, black poverty was found to be far more devastating and far more extensive than that of anybody else (Bell, 2002:514; Golden, 2004:11). The surprising results were achieved partly due to the fact that the Carnegie Corporation team involved black interviewers, with whom the interviewees felt free to discuss the problems they experienced.

Before the Second Carnegie Commission of Inquiry's official opening in 1982, a two-year period of preparatory and consultation took place among various stakeholders, including members of corporations, various black and white people (English- and Afrikaans-speaking groups) and Francis Wilson, the appointed consultant to the Corporation in 1980 (Bell, 2002:513). During this period other studies related to poverty, all over the world were evaluated. Those include studies done during the 1970s in Britain, Ireland, the European Common Market, Australia and the United States, where they were compared and contrasted not only with each other but with various studies, frequently supported by the ILO and The World Bank, in Kenya, Sri Lanka, Brazil, India and elsewhere (Wilson & Ramphele, 1989:X). The tone of the Second Carnegie Inquiry's report was summarised in its introduction statement: "Poverty is a profoundly political issue" (Pick, 2001:14). It then focused on the

various dimensions of poverty (hunger, illness, unemployment, widespread inequality, lack of adequate fuel), a series of causes and a wide range of policies for integrated development (Pick, 2001:14). The Second Carnegie Commission of Inquiry into Poverty in South Africa thus appeared with a concept of poverty that had many numerous facets (Wilson, 1996:233).

The Second Carnegie Commission of Inquiry into Poverty in South Africa was followed by the 1993 'Project for Statistics on Living Standards and Development' (PSLD), carried out by The World Bank, in collaboration with South African researchers for the ANC as a way of finding a definitive assessment of the extent of poverty in the country before occupying office, as negotiations were taking place with the intend of putting the country on the road to democracy (Magasela, 2005). The PSLD commissioned by the Southern African Labour and Development Research Unit (SALDRU), at the University of Cape Town, was the first nation-wide, representative household survey in South Africa. It was funded by the Governments of Denmark, the Netherlands and Norway (Klasen, 1997:52). Prior to the commencement of the survey itself, The World Bank proposed to undertake research into the existing literature, in order to assemble all information about living standards and development in South Africa. The findings of this survey will be discussed in this chapter, subsection 3.4.

The South African government, led by the ANC after coming to power, changed and renamed the parastatal statistics agency as Statistics South Africa. It also invested greatly in poverty data collection, initially from the October Household Surveys (OHSs) and Income and Expenditure Surveys (IESs), and later the General Household Surveys (GHSs), as well as on labour market matters (through dedicated Labour Market Surveys or LFSs) (Seekings, 2007:2).

After 1994, a series of important reports on poverty were commissioned and a series of public strategies were reoriented around developmental issues. These included the 1995 Key Indicators of Poverty in South Africa, the Participative Poverty Assessment-South Africa Report and the Poverty and Inequality Report, both published in 1998 (SPII, 2007:5). These reports and studies were part of a

government commitment to eliminating poverty that was exemplified as the “War on Poverty” proclaimed in 1996 by the then President, Nelson Mandela, on behalf of government and civil society organisations (SPIL, 2007:5). Subsequent works followed in the footsteps of these previous studies and reports. Some of the works include an important study of poverty status in South Africa, entitled ‘Transforming the Present-Protecting the Future’, published in 2002 (Taylor Committee, 2002). The report suggested the implementation of some social protection structure to deal with not just prevalent income poverty, but also extensive capabilities poverty and lack of access to basic needs and assets (Taylor Committee, 2002:122-124).

In terms of the 1995 Copenhagen Declaration, South Africa has a commitment to adopt an official measure of poverty. However, academics, agencies and different government departments have been developing and using different measurements. This use of different measures of poverty has led to disagreement and occasionally confusion about some of the results of poverty research. The conceptual inexactness of poverty significantly affects the development plans, while encouraging biased discussion (Everatt, 2003:77). Sometimes this has led to enormous ambiguity about poverty levels and variations in the terms of the nature and extent of poverty in South Africa (Meth, 2006). Referring to their specific constitutional mandates, some government departments conceptualised and defined poverty in terms of different dimensions of poverty manifestation, which allowed them to devise more effective policies than they could have developed if the income poverty line was used (SPIL, 2007:6). The indicators used were mostly related to the socioeconomic rights guaranteed in the South African Constitution (Seekings, 2007:3). For government departments to accurately realise their constitutional mandates, any poverty investigation needs to use dimensions of multiple deprivation instead of income/consumption-based poverty line (Magasela, 2005).

This difference in conceptualising poverty impacts considerably on how poverty is defined and measured, as well as the instruments that are utilized to operationalize these measurements. The South Africans government, academics and institutions ought to beware of merely determining poverty in terms of income, since a significant percentage of the population experience deprivations from means to meet basic

needs (such as food, housing, education and health provision) and to maximise their capabilities.

3.4 POVERTY DIMENSIONS IN SOUTH AFRICA

The poverty dimensions which have been taken into account in South Africa seem to be based on those which explored poverty in terms of income or expenditure and those which considered the multidimensionality nature of poverty and therefore different dimensions of deprivation. A number of poverty studies have been undertaken in South Africa, summarised in Table 3.1.

Table 3.1: Poverty studies in South Africa (1997-2014)

Author	Techniques	Data sets used
Klasen (1997)	Income based analysis	SALDRU 1993
Vichi (2000)	Index of deprivation	SALDRU 1993
Klasen (2000)	Index of deprivation	SALDRU 1993
May and Carter (1999)	Income based analysis	SALDRU 1993
Leibbrandt and Woolard (1999)	Income based analysis with FGT measures	LSDS 1993, IES 1995
Department of Health and Social Services, (1999)	HDI	1996 census
Klasen (2000)	Composite deprivation index	SALDRU 1993, using 14 indicators
Hirschowitz <i>et al.</i> (2000)	Provincial level development indices	1996 census
McIntyre <i>et al.</i> (2000)	General index for demographic and socioeconomic aspects, policy-perspective index of deprivation, SID	1996 census
Woodlard and Leibbrandt (2001)	Income-based approaches	1995IES
Ngwane <i>et al.</i> (2001)	CHAID Analysis	OHS 1995
Oosthuizen and Nieuwoudt (2002)	FGT poverty indices	OHS 1995
Alderman <i>et al.</i> (2000)	Household expenditure	1995 IES, 1995 OHS, 1996 Census
Qizilbash (2002)	Borda score, HPI	Census 1996

Table 3.1: Poverty studies in South Africa (1997-2014) (Cont...)

Author	Techniques	Data sets used
Ngwane <i>et al.</i> (2003)	Head count index, Watts measure	OHS 1995
Mattes <i>et al.</i> (2003)	LPI	Afrobarometer surveys 1999-2002
UNDP (2003)	Service deprivation index	Census 2001
Bhorat <i>et al.</i> (2004)	Asset and service deprivation	Census 1996, Census 2001
Van der Walt (2004)	TFA, TFR	Census 1996
Keller (2004)	Heckprobit analysis	OHS 1995, IES 1995
Simkins 2004	Income-based analysis	1995, 2000 IES and 1996, 2001 census
May <i>et al.</i> (2004)	Micawber threshold, Asset index	KIDS 1998
Van der Berg & Louw (2004)	Income-based approach	1995, 2000 IES
Naidoo <i>et al.</i> (2005)	TFR	Census 1996, Census 2001
Woolard (2005)	Shorrocks rigidity index, Gini index	PSLSD 1993, KIDS 1998
Western Cape Department of the Premier, 2005	HDI	2001 census
Leibbrandt <i>et al.</i> (2005)	income-based and access-based measurement approaches	1996 and 2001 Census
Noble <i>et al.</i> (2006)	PIMD	Census 2001
Hoogeveen & Özler, 2006	Income-based analysis (cost-of-basic-needs approach)	1995 OHS, 2000 IES
Van der Berg <i>et al.</i> 2006	Income-based approach	AMPS
Simelane (2009)	Asset-based index	2007 Community survey and the 1996 and 2001 censuses
Leibbrandt <i>et al.</i> , (2010)	Income-based approach	survey data from 1993, 2000 and 2008
Bhorat and Van der Westhuizen (2013)	Asset and service deprivation	PSLSD 1993, 1999 OHS, 2004 GHS
Finn <i>et al.</i> (2013)	MPI	PSLSD and NIDS Wave 2 datasets
Noble <i>et al.</i> (2014)	SAIMD	2011 Census

For the sake of brevity, the next subsection's emphasis will be laid on some prominent studies that have used national representative samples. These studies not only reported the global poverty level but also disaggregated poverty based on various socioeconomic, demographic and geographical aspects. The starting point will review the consumption-based approach works and thereafter multidimensional poverty measures that have been primarily used to profile poverty in South Africa. Studies will be discussed chronologically, to detect the poverty trends in South Africa.

3.4.1 Review of income poverty in South Africa

The income/expenditure-based measures follow The World Bank method of consumption/income wellbeing, where poverty is seen as the inability to achieve a minimal living standard in terms of consumption needs. The assumption is that the level of income, or its proxy consumption, could describe accurately whether or not individuals are able to achieve certain minimum thresholds on various dimensions such as nutrition, clothing and housing. This is the fundamental approach used by Statistics South Africa in profiling poverty (StatsSA, 2012a; 2014a). A large volume of the literature on inequality and poverty in South Africa focuses on population surveys either on a national or a sub-national level.

Using the PSLSD of 1993, the World Development Report indicated that, in South Africa, 11.5% of the population was living below the purchasing power parity (PPP) of one US dollar per day, while 35.8% was living on less than \$2 per day (World Bank, 2000:64). It is important, however, to consider and adopt local conceptions and constructions of poverty. In South Africa, as an upper middle-income country, boasting substantial material wealth, with corresponding high aspirations of its inhabitants, local poverty definitions suggest that even individuals having somewhat more than \$1 a day are viewed as poor (Klasen, 1997:54). The statistics indicate that poverty is more acute when local poverty measures established on minimum acceptable living standards are used than international rules of thumb would suggest. Due to the absence of a common national poverty line, Klasen (1997:37; 2000:55) followed the RDP's (1995) type approach, presuming that the poorest 40%

of households, measured in terms of adult equivalent expenditures, are regarded as poor; while the poorest 20% of households are regarded as ultra-poor. In 1993, these poverty lines were situated at R300 and R178 monthly expenditure per adult equivalent. More than a half (53%) of South Africa's population was found to be poor, while 29% was regarded as ultra-poor. Over 60% of Africans were poor compared to 1% of the white population. Poverty among South Africa's black African population was more severe compared to the countrywide poverty status. Klasen (1997:36-37, 2000:90) explains that the 40% benchmark corresponds to the locally applied poverty cut-off in South Africa, while the severe criterion is close to the \$1 a day poverty threshold applied by The World Bank for international comparison purposes.

Woodlard and Leibbrandt (2001:56-59) applied a series of standards (Household Subsistence Level and \$1 a day international poverty line) on 1995 IES and found that 40-50% of South Africans seem to be poor, while 25 appear to be ultra-poor. Woolard and Leibbrandt's (1999:6) study marks one of the prominent poverty studies that have used the 1993 PSLSD and 1995 IES surveys in analysing poverty using different definitions of poverty measures (including *per capita* consumption, total household consumption, *per capita* income, *per capita* food expenditure, *per capita* caloric intake, budget share of food expenditure and educational level of adult household members). Woolard and Leibbrandt (1999) disaggregated survey data according to demographic, socioeconomic, and geographical units.

In both surveys, a higher poverty rate was found among black South Africans and Coloureds compared to Asians and whites (Woolard & Leibbrandt, 1999:6-7). With the same 1993 survey, but this time focusing on poverty among the South African black population in rural areas, Carter and May (1999:2) found that more than a half of the considered population live below the poverty line of R237 (\$67) per adult equivalent per month. In terms of gender, due to the nature of the surveys (household level survey), the intra-household gender dynamics were not considered and the gendered poverty analysis was thus based on the household headship characteristics. In other words, the comparisons incorporated female-headed and male-headed households. Using the 1993 PSLSD, female-headed households were

found to have a far higher rate of poverty (60%) compared to male-headed households (31%). Female-headed households depend greatly on remittances as the main source of income, while they spend much of their time assuming caring and other domestic unpaid work, which makes them more vulnerable to poverty.

Comparing poverty across locational classification for 1993, a higher proportion of poor population was found to be living in rural areas (65%), compared to urban dwellers (22%), with 27% of poor rural dwellers living below half of the threshold (Woolard & Leibbrandt, 2001:59-60). The 1995 IES distribution of poverty, according to local classification, confirms that rural dwellers hold the highest share of the poor (48%), nearly double the second highest (metropolitan: 23.9%). The poverty gap is also higher among rural dwellers and poverty is severe in small towns. The distribution of poverty on a provincial level, based on the 1995 data, showed that poverty is mostly and consistently pronounced in the Eastern Cape Province (according to the three FGT poverty measures), while Gauteng province rated the lowest.

The poverty distribution by education attainment did not reveal a significant difference between people without formal education and those who have less than seven years' education. In terms of poverty distribution by health, a higher burden of illnesses, including fever, diarrhoea and mental disability, was found most among poor individuals. The 1993 PSLSD survey involved also a physical check-up of the heights and weights of children less than five years old, in order to assess their health status. Higher percentages of poor (31%) and ultra-poor children (38%) suffer from under-nutrition (such as stunting). An important note should be taken on how health should be assessed, as self-reported subjective health may be biased as the non-poor are more health aware and therefore over-report, while poor individuals would under-report.

Using the 1995 data (1995 IES and 1995 OHS), the race distribution of unemployment indicated that the highest unemployment rate was among the ultra-poor (59.4%) and poor blacks (52.7%), followed by ultra-poor unemployed Coloureds (46.1%) (HSRC, 2014:27). The trends appeared to be the same when the ultra-poor

were compared to the poor, while intriguing results showed that urban unemployment among the poor is worse than rural unemployment. While the non-poor's main sources of income are wages (72%), capital income (13%) and self-employment (6%), for poor households it is wages (40%), state transfers (26%) and remittances (17%). Access to services was also assessed with 1995 IES data. In general, poor and ultra-poor individuals lag behind significantly in accessing piped water inside dwelling, toilets inside dwellings and electricity. The access to the means of transport is another important indicator, as most poor individuals cannot afford their own transport. As a result, they spend much time walking or waiting for public transport, when they could have been using that time in income-generating activities.

The earlier representative surveys, especially that of 1993, reflect a clear picture of the living standards of South African under apartheid. With democracy, after 1994, the population was full of hope that inequality and income poverty would be decreased. The new South African government expressed, through the RDP, that it would “empower the poor to seize opportunities to develop to their full potential and to sustain themselves through productive activity, with the state ensuring improved access to social security, public education and other services. All South Africans should enjoy a decent living standard and economic security” (ANC, 1994:15, 16, 79). However, there is no consensus when it comes to poverty trends during the period 1995 to 2002.

Based on the real *per capita* expenditure from the 1995 and 2000 survey data, Hoogeveen and Özler (2006:64) found a great increase from 7.7% of people who were living below 1\$ a day in 1995, to more than one in 10 in 2000. By 2000, there were roughly 1.8 million additional South Africans living below the \$1/day and approximately 2.3 million more living below \$2/day than there were in 1995 (Hoogeveen & Özler, 2006:64). Using similar survey data to Hoogeveen and Özler (2006), Leibbrandt *et al.* (2005:37) found that real individual incomes deteriorated from 1995 to 2000 in South Africa. Similarly, through inflation adjustment, both household and individuals average income dropped sharply (StatsSA, 2002:27). Simkins (2004:6) revealed that between 1995 and 2000 poverty rose against a

constant real poverty line per individual, as confirmed by a couple of poverty measures (all FGT measures and Sen Index: these are discussed in section 2.5.1.). The analysis of the data from the 1999 OHS and the 2002 LFS indicates that the number and percentage of households and people living in poverty had increased (Meth and Dias, 2004).

The study of Van der Berg & Louw (2004:18) suggested a least decline or stabilised rate in poverty over 1995 and 2000, while Van der Berg *et al.* (2006:29) concluded that the poverty trend over this period was not clear. UNDP's (2003) reports indicated that the level of poverty seems to have dropped marginally over the period 1995-2002, but the poverty gap increased. Van der Berg and Louw (2004:18) concluded that the number of people living in poverty rose because of the population growth. However, the fact that the post-apartheid society started off with a high level of inequality adds an ominous note to the poverty trend. Due to the skewed distribution of human and physical assets that undergirds poverty and inequality trends in South Africa; it is not surprising that there has not been an impressive recovery in income/consumption-based poverty over the early years of the post-apartheid period (Leibbrandt *et al.*, 2010:18).

More recent years, have witnessed greater improvements against poverty in South Africa. The most highlighted impact of this gain was the importance of the social grant system as a social safety net, especially the state old age pension and the child support grant (Leibbrandt *et al.*, 2010:36). There is another share which is attributed to a modest drop in unemployment, mainly due of the expansion of the public welfare programmes (Leibbrandt *et al.*, 2009; Seekings, 2007; Van der Berg *et al.*, 2008). Using a lower-bound poverty line of R219 and R515, StatsSA (2012a:7) revealed that poverty has dropped over the period between 2000 and 2006, from 43.5% to 41.1%. It dropped from 57.0% to 54.1% when the upper-bound criterion is used, as indicated in Table 3.2.

Table 3.2: Poverty headcount 2000 and 2006

Year	Lower-bound (R219)	Upper-bound (R515)
2000	43.5%	57.0%
2006	41.1%	54.1%

Source: StatsSA (2012a:7)

In spite of the dramatic effect of the global financial crisis of 2008/2009, South Africa succeeded in decreasing poverty between 2006 and 2011. Applying an upper-bound poverty line of R620 to survey data collected through the IES 2005/2006, LCS 2008/2009 and IES 2010/2011, StatsSA (2014a:8) found that poverty levels in South Africa have fallen since 2006, from 57.2% to a low of 45.5% in 2011, as depicted in Figure 3.1. Besides the reduction of the headcount ratio, Stats SA (2014a:8) recorded a decrease in depth of poverty between the considered years. This signifies that beyond a decrease of poverty levels, the country has also been successful in reducing the depth of poverty (poverty gap). The narrower the gap, the closer to the poverty line poor households' incomes would be. As a result, it will be easier to graduate out of poverty. The narrowing of the poverty gap is good sign of effective policies and programmes implemented by the South African government in alleviating poverty among the poorest.

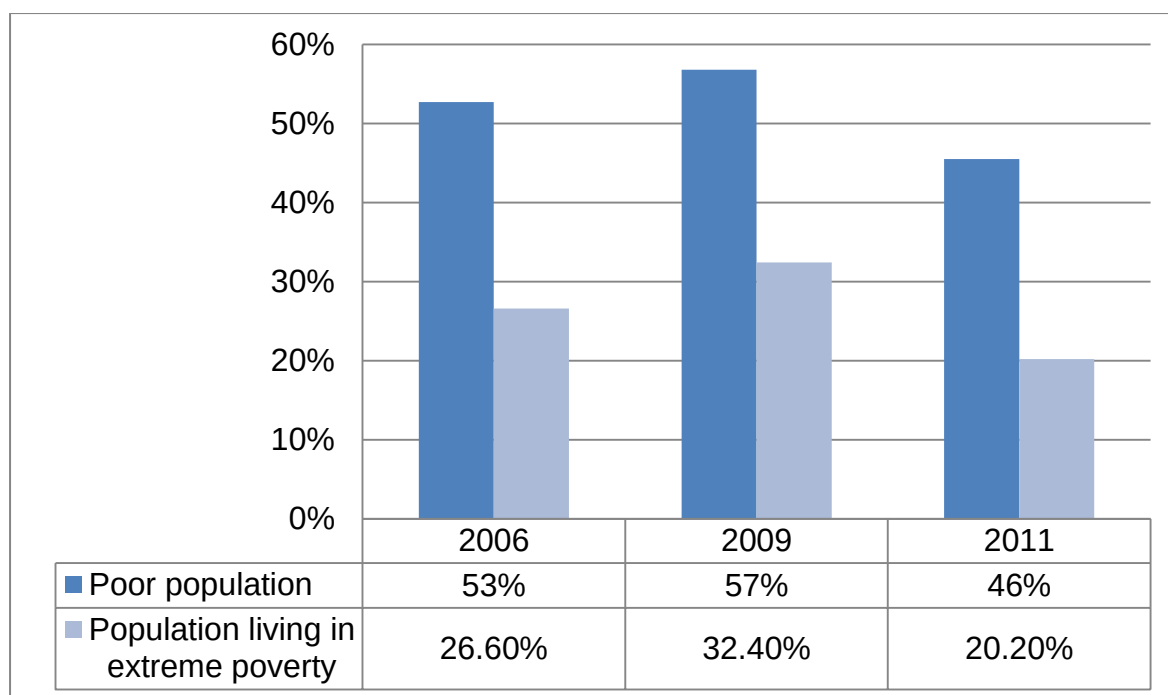


Figure 3.1: Poverty headcounts 2006-2011

Source: StatsSA (2014a:12)

3.4.2 Review of non-monetary poverty

There have been numerous of early efforts to measure poverty using deprivation indices. These include Vichi's (1997) and Klasen's (2000) deprivation indices based on the 1993 PSLSD; a Capability Poverty Measure (UNDP 1996), a Lived Poverty Index (LPI) (Afrobarometer 2004; 2005; Davids, 2010a; 2010b; Dulani *et al.*, 2013; Mattes, 2008; Mattes *et al.*, 2003); the UNDP's indices (including HDI HPI, Gender Empowerment Measure and Service Deprivation Index SDI) (UNDP, 2003) and Noble *et al.*'s (2006; 2010) PIMD and SAIMD. There are also a number of studies which concentrate on assets. These involve Booyesen's (2002), Sahn and Stifel's (2003), Simelane's (2009) and Bhorat and van der Westhuizen's (2013) studies. For the review, this subsection will consider only some of these examples. It is important to note that studies which used multiple deprivation indices or composite indices differ from those which presented data to show only discrete indicators (e.g. Bhorat *et al.*, 2004).

Based on the 1993 PSLSD, Klasen (2000) constructed a composite index of 14 components, including education, income, wealth, housing, water, sanitation, energy, employment, transport, financial services, nutrition, health care, safety and perceived well-being indicators. Similar to the monetary approach, Klasen's deprivation index found the black African population to be more deprived (67.1%) than other races (Klasen, 2000:50). Both categories of female-headed households (*de jure* and *de facto*) were found more deprived (61.7% and 83.5%, respectively) than male-headed households (44.3%). In terms of location, rural dwellers were more deprived compared to other types of location. People without formal education were found to experience more deprivation (81.5%), compared to other categories (less than primary: 69.5%, less than secondary: 36.8 %, secondary and above: 7.0%) (Klasen, 2000:50). When the multiple deprivation index was compared to the expenditure poverty, Klasen (2000:56) found a very strong overall correlation between expenditure levels and the deprivation index and a much weaker one among the worst-off sections of society. The deprivation index found a much more accentuated picture of poverty among the least favoured groups in society.

McIntyre *et al.* (2000) examined the link between socioeconomic status and health in South Africa, at magisterial district level, on the basis of three deprivation indices using data from the 1996 Census. A general index of deprivation of some demographic and socioeconomic variables was produced through principal component analysis (PCA). A policy-perspective index of deprivation was generated on the basis of groups acknowledged by policy-makers to be priorities, while a Single Indicator of Deprivation (SID) was concerned only with access to piped water. Once the results of these indices were compared to mortality indicators, the findings indicated that, in the South African context, deprivation is multi-faceted and is condensed in some regions of the country, where it is associated with ill-health (McIntyre *et al.*, 2002:30). Except for the SID, the other indices used in McIntyre *et al.* (2000) may be considered as indices of multiple deprivations, as they include variables relating to various characteristics of deprivation. These indices, however, were not created to conform to any specific model of multiple deprivations (Noble *et al.*, 2006:10).

Through the Afrobarometer project, Mattes *et al.* (2002:8) applied the multifaceted, but unidimensional, LPI in South Africa and other countries of southern Africa. The LPI measure was first implemented by the New Democracies Barometer surveys in Central and Eastern Europe, then in Africa by Afrobarometer (Davids, 2010b:14). The LPI measures people's capacity to access the basic necessities of life. To generate the LPI the participants answer questions about how often a family has gone without the seven items on the scale: food, water, medical treatment, a cash income, home fuel, electricity and home security. Respondents use an ordinal level response scale, with the following options: 'Never', 'Just Once or Twice', 'Several Times', 'Many Times', or 'Always' (Mattes *et al.*, 2002:6). The Afrobarometer surveys combine indicators of LPI and dimensions of political values and behaviour. Supporting this combination, Mattes *et al.* (2002:3) cautioned that poverty could inhibit individuals from participating in processes that create opportunities for stable democracy. These include education, modernisation and using the mass media. Instead, it may well be that poor individuals do not see the reason to be concerned with satisfying "higher order" needs (security, freedom, equality, self-government) due to the priority of satisfying a series of basic subsistence needs (Mattes *et al.*, 2002:3). In line with this argument, The World Bank (2000:15) claims that poor individuals are usually exposed to adverse incidents outside their command. They are frequently neglected and excluded from voice and power by society and the institutions of state (World Bank, 2000:15). The UNDP (2003:47) generated an SDI for South Africa in order to offer a more inclusive yardstick of progress distribution and to quantify the backlog of deprivation in seven considered dimensions. The basic services examined were housing, refuse removal, water, energy for cooking, lighting and heating and toilet facilities (UNDP, 2003:47).

Noble *et al.* (2006) proposed a multiple deprivation index, using five broad domains or dimensions of well-being. Every domain is produced as a separate domain index indicating a certain aspect of deprivation. Each domain index is made up of various indicators, totalling 13 generally. The first domain is income and material well-being, which applies to individuals living in households whose income is less than 40% of the average equivalent household income and do not own some assets, including

fridge, TV and radio. Second comes the employment deprivation, which assesses individuals of working age (15-65) who are either officially unemployed or not working due to illness or disability. Health deprivation is the third domain, which captures years of potential life lost. The fourth dimension measures the level of deprivation in education, based on the number of 18-65 year old people with no schooling at secondary level or above. The fifth is living environment deprivation distinguishing deprivation concerning the poor quality of the living environment. The indicators of this domain include access to piped water, a toilet facility, electricity, telephone, type of dwelling (e.g. shacks) and number of people in the household.

Noble *et al.* (2006) created the PIMD to measure deprivation at provincial and ward levels. In each province, wards are ranked by PIMD scores. However, the PIMD rates do not allow deprivation comparison between provinces and they are alleged to be difficult to interpret for policy specificity purposes (HSRC, 2014:28). Noble *et al.* (2006:31) assigned equal weights to the different domains, claiming that there is no evidence suggesting the use of different weights. Intuitively, it would be absurd to believe that the various domains are considered equally important by the policy-makers or the deprived people (HSRC, 2014:24). This kind of analysis would be preferable once it allows the policy-makers to target the neediest regions. Even though the idea of deprivation is provided, it ignores the need for identifying the possible resource requirement that would be needed to deal with the deprivation issue. Moreover, it does not consider the severity of poverty (inequality among the poor). Noble *et al.* (2010) used a similar conceptual and methodological technique and extended the PIMD into the SAIMD, which this time included all areas in South Africa to be set alongside one another, in order to allow the comparison of geographical units which happen to have the same population size.

Simelane (2009) followed the method employed by Noble *et al.* (2006) in creating an index of the assets and capabilities poverty, to measure deprivation in South Africa during the period 1996-2007. Simelane (2009:13) generated an index of living standards, by bringing together various dimensions of wellbeing, combining relative, absolute and capability deprivation approaches. Unlike the study of Noble *et al.* (2006), to elude the subjective weight allocation Simelane (2009:14) used the PCA,

which involves the use of covariation of the variables in the index to ascribe weights to every dimension of deprivation. The composite index of assets and capabilities poverty was generated based on the information on eight types of household assets/features and two indicators of household functional capabilities. Assets consist of source of energy for cooking, lighting and heating, type of toilet facility, types of dwelling, ownership of telephone, means of refuse disposal and main source of household water supply. Capabilities include proportion of adults with high school and above and the proportion of employed adults in each household. The main concern of the asset-based deprivation approach is that it ignores the importance of health-related issues in determining one's well-being.

An important note to take from Simelane's (2009) work is the approach used in determining the spatial mapping of poverty. It is considered that the interpretation of geographical maps of poverty could be misinforming, given the fact that some cluster patterns could occur randomly, without any public policy meaning (Wang, 2006). Simelane (2009) employed the spatial clustering test to investigate the autocorrelation between variables, by location, looking at the association of values of variables at a given location with those observed in neighbouring locations. As a result, the statistical significance removes any suspicious random occurrence of clustering. After determining the geographical map of assets and capabilities distribution, Simelane (2009) determined the levels and trend in household assets and capabilities poverty during the period 1996-2007. The asset poverty index indicated that assets and capabilities poverty dropped approximately 10% over the considered period, while access to the included assets and capabilities all improved. The results of cross-tabulation and logistic regression are consistent with the conclusions drawn from income/consumption-based studies of poverty concerning the disparities of poverty levels by place of residence, age and sex of household head and race in South Africa. For example, African households were found to be the poorest in the country, while urban households were found to be less likely to be asset and capabilities poor, compared to their rural counterparts. Male-headed households were found to be less asset and capabilities poor than their female-headed counterparts to be poor

Based on the MPI, which uses nine indicators within three dimensions, Finn *et al.* (2013) measured the deprivation trend for South Africa from 1993 to 2010. Indicators considered were years of schooling, school enrolment, child mortality, nutrition, cooking fuel, sanitation, water, electricity and assets. The computation of the MPI has two components. Firstly, the multidimensional poverty headcount ratio, defined as the proportion of individuals that are multidimensionally poor, in order to determine the incidence of poverty. Secondly, there is a need for the determination of the average proportion of the nine indicators in which poor individual are deprived, in order to identify the average intensity of poverty. A huge decrease in overall multidimensional poverty in South Africa from 1993 to 2010 was found. It was influenced mostly by sizeable increase in access to water, modest sanitation and electricity while mortality and nutrition deprivation declined.

However, even though some multidimensional poverty measures are trying to reach agreement on just determining what basic needs are, there is still necessity for considering more than just the fulfilling of the basic needs. In this regard, certain significant respects and stark economic divisions might remain existent, even if every individual has successfully achieved the most basic needs. Therefore, it is necessary to recognise and discuss the effect of equal and unequal access to resources, in addition to the study of poverty or deprivation, especially South Africa where it is very difficult to avoid the issue of inequality when discussing poverty.

3.5 POVERTY AND INEQUALITY

Inequality is defined as a feature of social power relations in the sociological sense (SPII, 2007:8). Inequality exists when the membership of different social groups is related to extremely differential power relations. In this regard, inequality is strongly related to the social exclusion concept, in the way that unequal power relations can be associated with differential access to socioeconomic or political rights (Warwick-Booth, 2013:6). Inequality is also related to the presence of strictly institutionalised social hierarchies, as between 'masters' and 'servants' in societies where there are, or have been slaves, or in societies where class identity and race are directly connected (SPII, 2009:8). It is therefore a difficult exercise to directly measure

inequality, since it is a characteristic of relations. However, it is still possible to break down indirect dimensions that assess the effect of unequal social power relations. Looking at a narrower economic and quantitative sense, inequality in a particular population could describe the imbalance in the distribution of specific resources, including income (SPII, 2007:10).

Inequality matters for poverty. Poverty and inequality have co-existed for years in developed and developing countries. Despite the manifold interventions, the improvement in eradicating this issue in South Africa continues to be tenuous (Triegaardt, 2006:1). SPII (2007:11) pointed out that in a well-resourced nation, the presence of poverty can be said to be a manifestation of inequality. Poverty and inequality in South African society is rooted in its complex history and cannot be comprehended without referring to the effect of race and racism of the apartheid system. South Africa's history presents a particular background of causes of poverty. According to Hunter *et al.* (2003:3), these involve:

- The impact of apartheid which stripped people of their assets, mainly land, distorted economic markets and social institutions through racial discrimination and resulted in violence and destabilisation;
- The undermining of the asset base of individuals, households and communities through ill-health, over-crowding, environmental degradation, the mismatch of resources and opportunities, race and gender discrimination and social isolation; and
- The impact of a disabling state, which included the behaviour and attitudes of government officials, the absence of information concerning rights, roles and responsibilities and the lack of accountability by all levels of government.

These past restrictive economic practices shaped the nature of South Africa's society and economy. They reflect apartheid's legacy of poverty and inequality. They led to a skewed income (or resource) distribution, but also to an unequal distribution of skills and training (Hunter *et al.*, 2003:3). In 1998, the former president of South Africa, Thabo Mbeki, famously referred to South Africa as a 'two-nation' society,

where there is a relatively prosperous nation of white people irrespective of gender or geographic distribution. The other nation was the larger, composed of black and poor, with the worst-tormented being black rural people, in general, particularly females and the disabled (Gelb, 2003:1; Seekings, 2007:9).

The inequality dynamics have shown different trends since the beginning of a democratic South Africa. One way of expressing the inequality level in a country is utilising the Gini coefficient. The Gini coefficient is widely used to measure inequality. Values can vary from 0, indicating perfect equality, to 1, representing perfect inequality. South Africa's income inequality levels are among the highest in the world, with a Gini coefficient at around 0.70 in 2013 (OECD, 2013:25). Income disparities seem to be even starker within South Africa, compared with the global level. Looking at some of the BRICS countries (an association of five major emerging national economies: Brazil, Russia, India, China and South Africa), for example, the Gini coefficient was 0.68 in South Africa, while it was 0.55 in Brazil in 2008 and 0.40 in the Russian Federation in 2009 (OECD, 2013:25).

While income inequality among the races may have dropped to some extent, it has widened and shifted from race to the income gap among different social strata within the population as a whole (Netshitenzhe, 2013:1). This has led to the conclusion that poverty and inequality are less likely related to race and more to class, but no less a severe menace, looking at the effect on social stability (Friedman & Bhengu, 2008:12). Over time, race-based redistribution might turn out to be less successful relative to policies concerning the rise of inequality within every racial group and particularly within the African group. Growing inequality within the labour market, caused by the increase in unemployment and the increase in remuneration inequality, remains behind increasing aggregate inequality levels (Leibbrandt *et al.*, 2010:4). Consequently, these trends have barred the labour market from contributing positively to inequality reduction.

The Gini coefficient for every racial group as indicated in Table 3.3 shows that the intra-race inequality has risen significantly for all racial groups. By 2008, among the four main racial groups, the African majority racial group had the highest inequality.

This indicates that the intra-racial dynamics have become more influential, especially when looking at the African group in influencing the aggregate changes in inequality. A comparison of aggregate Gini coefficients for 1993, 2000, 2005, 2008 and 2013, shown in Table 3.3, demonstrates this increase in income inequality in South Africa.

Table 3.3: Gini coefficients of *per capita* income, aggregate and by race (1993-2008)

Year	Aggregate	African	Coloured	Indian	White
1993	0.67	0.55	0.43	0.46	0.42
2000	0.67	0.61	0.53	0.50	0.47
2005	0.72	0.62	0.60	0.58	0.51
2008	0.70	0.62	0.54	0.61	0.50
2013	0.70	-	-	-	-
1993-2008, % change	4.50	12.70	25.60	32.60	19.10

Source: PSLD 1993, IES (2000, 2005), National Income Dynamics Study (NIDS) (2008) & OECD (2013)

Notwithstanding the impact of state transfers on poverty, as discussed in section 3.3.1, government social assistance has not succeeded in pulling down inequality levels. As a result, the problem of high inequality inherited from apartheid has continued to dominate the economic strategic efforts of the post-apartheid government. To get to the bottom of this post-apartheid high income inequality, it is important to take into account the impact of source of income of the households. The source of income can be grouped into four categories, including income received in terms of salaries and wages (self-employment income included), capital income (such as dividends, interest, rent income, imputed rent from residing in own dwelling and private pensions) and transfer payments received from private or government sources (social grants and remittances) (Taylor Committee, 2008:100; Leibbrandt *et al.*, 2010:19). Each of these groups is closely related to a set of economic relationships that describe and structure a modern capitalist economy. Exclusion from, or marginalisation within, these sources of economic resource flows, greatly increases the risk of poverty and inequality. Leibbrandt *et al.* (2010:19) found that wages income (including self-employment income) hold the highest share of income

(approximately 70%) and greatly contribute to inequality, with a share around 85%. This is pushed by the great number of population without labour income, given a high unemployment rate and inactivity (OEC, 2013:25). In contrast to wages, state transfers appear to contribute up to 10% of income, but they have almost no effect on inequality (Leibbrandt *et al.*, 2010:19). As result, the labour market appears to be one of the main drivers of South African income inequality.

Geographical aspects should also be emphasised strongly in the understanding of what influences inequality and poverty South Africa. During the apartheid era, some areas were not only prioritised and developed to the detriment of others. There was forced relocation into the rural areas, centred on rural labour reserves, designed as Bantustans (homelands), with rigorous limitation of movement (Coovadia *et al.*, 2009:819). ‘Homelands’ continued to be mostly underdeveloped and poor with low economic activity, low employment and limited infrastructure (Noble *et al.*, 2014:1). Since 1993, migration from rural areas/homelands to cities and towns, in pursuit of a better life, has enlarged urban inequality while reducing rural inequality (Leibbrandt *et al.*, 2010). For instance, the Gini coefficient in 1993 and 2008 in rural areas was 0.58 and 0.56, respectively, while in urban areas the 1993 Gini coefficient of 0.61 rose to 0.67 in 2008 (Leibbrandt *et al.*, 2010:33). The lower and decreasing rural inequality does not necessarily explain that the living conditions have improved, since it is the result of a large influx of poor individuals into areas where higher incomes are being earned.

Beside the spatial differences, one can still wonder to what extent access to endowments, such as social services and education, can influence the wealth and income distribution. Improved access to endowments brings a positive change, but it is far from being sufficient in changing *per capita* income distribution (Leibbrandt & Levinsohn, 2011). Persistent unemployment, a low demand for unskilled labour and an unequal education system have been frequently discussed as the immediate causes of persistent poverty and inequality in South Africa (Friedman & Bhengu, 2008:9; Seekings, 2007:12).

3.5.1 Causes of poverty and inequality: unemployment and education

From the poor's own perspective, through the interviews conducted by the South African National Development Agency (NDA), the key determinant of poverty was recorded as education, which immediately associates with employment status (HSRC, 2014:15). It was found that all other concerns are secondary.

Unemployment is one of those things which everybody understands, but which turns out to be controversial to define and to measure, even more so than poverty and inequality. There are two widely used definitions: a 'strict' and an 'expanded' definition. According to the strict definition, unemployed persons are those persons who, being 15-65 years, (a) are not in paid employment or self-employment, (b) were available for paid employment or self-employment during the seven days preceding the interview and (c) took specific steps during the four weeks preceding the interview to find paid employment or self-employment. The expanded definition omits requirement (c) (Mohr *et al.*, 2008:498). Prior to 1994, the strict definition was used by Statistics South Africa to estimate unemployment, with the result that the official estimates were generally regarded as being too low. Statistics South Africa subsequently switched to the expanded definition, but some observers (including the ILO) regarded the new official estimates as being too high.

Poverty South Africa originates from deagrarianisation and unemployment (Seekings, 2007:12). South Africa has one of the most interesting labour markets in the world. Its sharp segmentation, high unemployment and low non-farm informal sector employment make it an international outlier (Sekhampu, 2010:104). Poor people are not land-holding peasants, supplementing subsistence production with occasional sales of agricultural produce, casual employment or remittances from migrant labour (Seekings, 2007:12). The only assets they have are their own two hands and their willingness to work. In such a situation the best investment is in human resource development Seekings and Nattrass (2005) felt that peasantry was gradually demolished during the Twentieth Century. Seekings (2007:12) claimed that forced removals from large commercial farms, overcrowding in the 'homelands' or 'Bantustans', low-quality schooling, poor links with urban and industrial labour

markets and the growing capital intensity of production in most economic sectors resulted in the growth of unemployment among unskilled workers and of mass poverty among them and their dependants.

Poverty and inequality accompany unemployment (Triegaardt, 2006:3). The impacts of unemployment on poverty South Africa are amplified by the increase of in 'underclass' of individuals who experience systematic marginalisation in the labour market and find it difficult to escape poverty (Seekings & Nattrass, 2005). For a number of unemployed individuals, poverty is transitory and could end any time they find employment (Seekings, 2007:13). However, another group of people lack the skills (including language skills), credentials and (particularly) the connections (such as social capital) which are very important in order to find employment (Seekings, 2007:13). These include the underclass. With wages being the main source of income for individuals, the loss of employment, or the failure to get employment, has a devastating effect on society in general and on individuals and their dependants. A person who becomes unemployed suffers a loss of income, shock and frustration. In certain circumstances unemployment can result in hunger, cold, ill-health or death and sometimes to criminal activities.

Unemployment is always a loss to society. Unlike factors of production (capital and land), labour cannot be saved and used later. If labour is not used when it is available it is lost forever. In South Africa there appears to be a definite correlation between criminal, social and political violence and the level of unemployment (Mohr *et al.*, 2008:499). Unemployment benefits and other social welfare programmes assist only unemployed people who have contributed to unemployment insurance schemes during the time they were employed. Many people do not have access to unemployment benefits, and those who *do*, receive benefits for a limited period only (Mohr *et al.*, 2008:499). Undoubtedly the most important form of social capital is having family or friends who are employed and are capable of helping someone to find employment (Seekings, 2007:13). It is thus perturbing that some households do not have any member in waged employment.

The unemployment statistics presented in Figure 3.2 used the narrow definition. The unemployment rate is shown to increase in the period from 1993 to 2000 (from 13.70 % to 25.70%, respectively), followed by a marginal decrease from 2000 to 2008 (25.70 to 24.40, respectively) and rise again to 25.20% at the beginning of the year 2014. This was confirmed by the IMF (2013:49), where it was mentioned that South Africa has one of the highest unemployment rates, one of the lowest labour force participation rates (55%) and exhibits one of the highest income inequality gaps in the world.

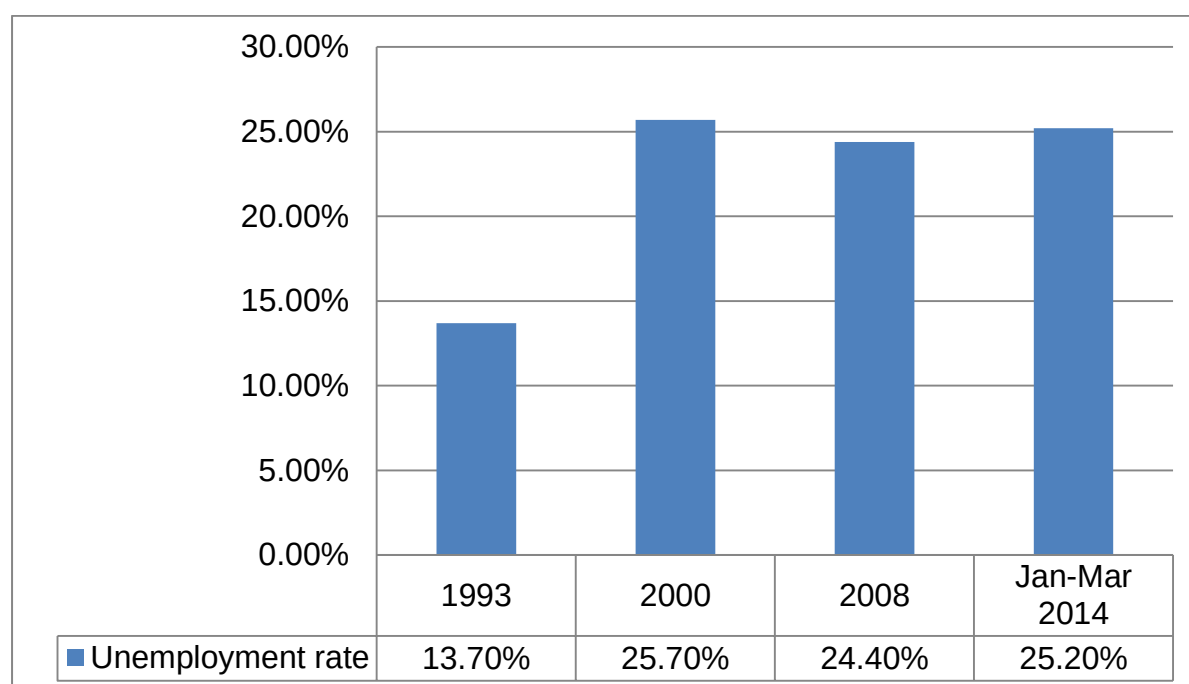


Figure 3.2: Unemployment rates in South Africa

Source: The calculation of Leibbrandt *et al.* (2010:32), using data from SALDRU 1993, IES 2000, NIDS 2008 data sets & StatsSA (2014b)

The era of eminent growth has been accompanied by a certain decrease in unemployment, but has been unable to tackle structural unemployment. Since 2009, the number of jobless has grown. South African unemployment is mainly a structural problem, not a cyclical problem, and the response strategy should address the kind of unemployment existing in the labour market (Triegaardt, 2006:5). In South Africa, as elsewhere in the world, unemployment is predominantly a youth problem, with

youth unemployment in South Africa registering 50% (ILO, 2013). There are many who recommend a need for extending the social grant system to focus precisely on the unemployed who are not covered by other social grants (Woolard & Leibbrandt, 2010:28). While economic growth has supported the sustainability of the growth of the grants system thus far, it is questionable whether or not a permanent income support for the unemployed would lead to the desired outcomes. As pointed out earlier, unemployment in South Africa is dominated by the youth and, while they clearly need some sort of social safety net or temporary social insurance, the longer-term goal of policy should be directed at helping this group enter the labour market and remain in work in the long term. Unemployment is very high among persons with a low level of formal education and lower skills (IMF, 2013:49).

Education as a major indicator of human capital should not be forgotten as a correlate with poverty. On the one hand, poor education attainment and skill mismatches contribute to unemployment (IMF, 2013:7). On the other, good education does not only predispose people to be able to acquire employment opportunities, but also gives them the capabilities to be able to access and make productive use of the other capitals (HSRC, 2014:15). The importance of education to households being poor shows differing results, as found by many researchers (Baiyegunhi & Fraser, 2010:2; Botha, 2010:142; May *et al.*, 1998, Woolard & Klasen, 2005:890). Primary education has been found by these studies to have little impact on a household's ability to escape poverty. Only those with secondary and post-secondary education contribute positive returns to household income.

Unequal distribution of education, both in quantity and quality, is perceived as an accelerator, leading to inequality in labour market earnings and as a major factor in the intergenerational transmission of inequality (Lam, 1999:2). As result, the emphasis should be laid on education, given its potential as a policy tool that can simultaneously decrease inequality and lift the mean income. High income inequality in South Africa was found to be connected with the differential rates of return to educational and unequal grade attainment (Lam, 1999). Seekings (2007:14) stresses that education and skills of new entrants to the labour force greatly influence the determination of the ways that inequalities change over time.

In spite of considerable expenditure on public education, Seekings (2007:14) warned that most young South Africans leave school and join the labour market with limited skills, where they are not equipped for semi-skilled or, particularly, skilled employment. This leads to a serious mismatch between the supply and demand for labour which would be characterised by high unemployment among the unskilled and low salaries and wages among the unskilled workers who were lucky enough to be employed. In line with this, Terreblanche (2002:467) pointed out that South African unemployment is structural. This kind of unemployment results from the fact that the composition of the labour force does not respond immediately or completely to the new structure of job opportunities.

Given the systematic reorganisation of the whole school system due to the change in government in 1994, there were unavoidable destabilisation impacts on schools. When one looks at the grade 12 examination (Senior Certificate or matric), as stated by Taylor (2007:524) to be the only system-level indicator of the school sector in South Africa, it is clear that the period between 1994 and 1999 has been marked with a decline in the official pass rate, from 58% in 1994 to 49% in 1999. Matric exemptions declined from, 88 497 persons in 1994 to 63 725 in 1999 and exemption rate from 18% in 1994 to 12% in 1999. After 1999, the Minister of Education established a National Monitoring Forum, which was aimed at improving the senior certificate examination results (Ministry of Education, 2001; 2002). The impact of this initiative was indicated with a sharp turnaround of pass rates from the year 2000. However, Umalusi (2004) and Seekings (2007:14) revealed that a great part of this was due to the idea that the matric exam had become less demanding. It is also reported that the numbers writing matric exams declined from 540 562 in 2008 to 504 368 in 2011 (Taylor, 2012:4-5).

It is seemly that public policy needs to target poverty and inequality reduction, keeping in mind that poverty alleviation may not necessarily ensure the inequality decrease. Since 1994, the South African government initiated different anti-poverty policies. Those policies are the Reconstruction and Development Programme (RDP), the Growth, Employment and Redistribution (GEAR), the Integrated, Sustainable Rural Development Programme (ISRDP), the Urban Renewal Programme (URP),

the Accelerated and Shared Growth Initiative for South Africa (ASGISA), the Joint Initiative on Priority Skills Acquisition (JIPSA), the New Growth Path (NGP) and the National Plan Development (NPD) (Republic of South Africa, 20013:17-18).

3.6 POVERTY IN THE FORMER HOMELANDS

3.6.1 Background

As a matter of background, 'homelands' were established in 1951, under the Bantu Authorities Act. They were established for black African groups approximately 20 million black South Africans until they were reincorporated into South Africa in 1994 (Mariotti, 2012:4). There were 10 homelands that were established, namely, Transkei, Bophuthatswana, Ciskei, Venda, Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa and Qwaqwa. In terms of land area, homelands occupied approximately 122.1 million hectares, which represented 13.96% of the total South African land (Pienaar & Von Fintel, 2013:9), yet they housed approximately 50% of the African population (Mariotti, 2012:4).

In terms of land quality, most homelands were not only geographically fragmented, with poor infrastructure between them, but land quality was poor and not suitable for agriculture because of its mountainous nature (Horrell, 1973:6). More than 70% of black households practised crop farming, on plots smaller than two hectares, with the majority (56.8%) farming on less than half a hectare. Most farmers were classified as backyard farmers. Most homelands experienced poor rainfall, aggravating the problem of depending on agriculture. Most farmers had no personal ownership of the land, which was communal or tribally owned (Mariotti, 2012:12; Lahiff, 1997:vii). This had an effect on asset ownership, which is a critical coping mechanism in most poor communities. It is also meant that household farmers would have limited economies of scale in the homelands and could not penetrate in the markets. (Pienaar & Fintel, 2013:15).

The South African government granted independence to some of the homelands during the 1970s. These were Transkei, Bophuthatswana, Venda and Ciskei, although, they were never recognised by any other country (Mariotti, 2012:10). The

remaining six, Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa and Qwaqwa, had insufficient self-governance (Beinart, 2001). There was resistance from the homeland governments to have independence, mainly because of their limited land areas and poor quality of land, which rendered them economically unviable nations. The quality of the land was a crucial factor, especially during the 1960s, when there were limited alternative opportunities for employment. This period also saw forced resettlement increasing within the homelands, when millions of Africans were forced off white-owned farms and out of towns (Feinstein, 2005:194).

Most homelands could not offer a variety of employment opportunities, as they contained very few towns and, in some cases, no cities at all (Collinson *et al.*, 2006:4). In spite of this, there were some employment opportunities, mostly in the nearby white-dominated towns. These opportunities were not sufficient to absorb the massive labour supply. As time went by, in 1962, there was an increase in agricultural employment (Feinstein, 2005:195) which later declined mainly due to mechanisation in the agricultural sector, as well as the downscaling of labour tenancy (Crush, 1986; Feinstein 2005). This was in contrast with the manufacturing sector employment, which was booming, but not growing fast enough to absorb the high levels of accumulative unemployment in the homelands (Mariotti, 2012:11-12). Wilson (1972:135) claims that a R180 wage was a minimum income per year to sustain a family living in an urban area. Despite this being a small income, most people would have preferred that basic level of income for a better living than being in a homeland (Wilson, 1972:135). In other words, the social and economic conditions within the black homelands were exceptionally harsh, by any standards. In general, there was poor infrastructure development and welfare services, coupled with high levels of poverty, which gave homelands very low standards of living, compared to most parts of South Africa (Lahiff, 1997:vii). Despite the fact that data collection was inadequate in the homelands, most literature descriptions have shown that life in general was hard for most people in the homelands. The worst poverty concentration was experienced in the former homelands, also called 'Bantustans' as further discussed by Lahiff (1997:vii).

3.6.2 Previous studies in former homelands

The former homelands were reincorporated into the Republic of South Africa in 1994. In spite of this development, these areas still significantly differed in terms of deprivation and income poverty, compared to other parts of the country. With some exceptions, there has not been much research undertaken in terms of a multidimensional measure of poverty in the former homelands, and more specifically, the use of the Alkire and Foster methodology. This methodology distinctly identifies the multidimensional poor from non-poor. There are several advantages in using this methodology, identified by Alkire and Seth (2009), to estimate multidimensional poverty and identify poor households.

The methodology provides a valid treatment when using the ordinal/categorical data. It treats the dimensions of poverty and deprivation independently of other dimensions, without assuming substitutability across dimensions. The methodology is flexible in terms of assigning equal or different weights to other dimensions according to their relative importance. The Alkire and Foster methodology, by increasing the aggregate cutting off point, becomes a strong tool in isolating the poorest of the poor from just the poor. The methodology is highly useful for policy orientation, as it provides more information on the dimensions which are behind the multidimensional poverty when comparing certain regions or groups of households. It can provide a basis for proper social protection mechanisms for households. For example, which household falling under the poverty line and deprived in health dimension would require health insurance?

Using the 2001 data zone level, based on the South African Index of Multiple Deprivation (SAIMD), Noble & Wright (2012) profiled the deprivation level within South Africa, particularly in the former homelands. There were four domains of deprivation that were incorporated namely, income and material deprivation, employment deprivation, education deprivation and living environment deprivation, with the deprivation dimension expressed as a simple rate. Table 3.4 indicates, in terms of deprivation, the percentage of the population of each former homeland. With a population of about 43% of the total South African population in 2001, by a

wider margin, the results show that all former homelands areas were deprived compared to the rest of South Africa. In respect of income deprivation, the least deprived former homeland is the former Bophuthatswana, where 85% of the population are income deprived, compared to 'the rest of South Africa', where the overall income deprivation rate is 64%. The table indicates in Living Environment domain the apparent distinction between rates of deprivation in the former homelands and elsewhere, where the rate is at 50%.

It can be reasoned however, that the comparison with 'the rest of South Africa' gives a much broader category, as it may obscure the fact that there is great spatial heterogeneity in areas that are not former homelands; particularly because there are some urban townships which are also part of the spatial legacy of apartheid (Christopher, 1994). This was the case due to a lack of a comprehensive set of digitised boundaries for all townships in South Africa. Noble & Wright (2012) used digitised boundaries for a large township within the Cape Town Metropolitan area as a case study. Khayelitsha Township is a predominantly black African community about 30 km from the centre of Cape Town. Approximately 60% of the dwellings were classified as shacks in the 2001 Census and its non-institutional population was just over 300 000. Khayelitsha provides a better replica of deprivation dimensions, as presented in Table 3.5 compared with that of South Africa, but they were still significantly lower than the rate in former homelands.

Table 3.4: SAIMD 2001 deprivation rates by domain by former homelands and for ‘the rest of South Africa’

Region	% Income deprivation	% Employment deprivation	% Education deprivation	% Living environment deprivation
Former Bophuthatswana	85.4	55.8	41.6	82.7
Former Ciskei	89.8	69.2	38.5	77.7
Former Gazankulu	91.0	63.4	50.3	89.5
Former KaNgwane	91.2	56.8	50.2	87.6
Former KwaNdebele	88.6	56.2	45.4	84.8
Former KwaZulu	92.0	66.6	47.2	87.2
Former Lebowa	92.6	63.4	45.6	92.9
Former Qwaqwa	91.5	64.4	40.3	84.0
Former Transkei	96.1	71.5	56.9	97.0
Former Venda	90.7	60.3	44.6	93.7
Rest of South Africa	64.3	37.3	30.2	50.0

Source: Noble and Wright (2012:11)

Table 3.5: SAIMD 2001 deprivation rates by domain for all former homelands, Khayelitsha and the rest of South Africa

Region	% income deprivation	% Employment deprivation	% Education deprivation	% Living environment deprivation
Former Homelands	91.6	63.9	47.3	89.2
Khayelitsha	85.5	52.7	30.9	76.3
Rest of South Africa	64.3	37.3	30.2	50.0

Source: Noble and Wright (2012:11)

Using the Provincial Indices of Multiple Deprivation for South Africa (PIMD) 2001, Noble *et al.* (2006) gave an analysis of multiple deprivation, using five domains (Income and Material Deprivation, Employment Deprivation, Health Deprivation,

Education Deprivation and Living Environment Deprivation), but it was not possible to use their indices in terms of comparison between provinces. With a focus on the current research, the former homeland of Qwaqwa in Maluti-a-Phofung municipality was found to have the highest levels of deprivation as compared to the whole province of the Free State (Noble *et al.*, 2006:39).

The General Household Survey (GHS) 2010 found that of the approximately 4.79 million black individuals in the former homeland, almost half were involved in agricultural production (Pienaar & Von Fintel, 2013:10). On average, the population in former homelands was more advanced in age, with low education. Most of the households were female-headed (Pienaar & Von Fintel, 2013:11). In terms of income, most households, on average, had lower income levels and critical differences could be drawn in comparing the household incomes in the homeland, which was about R1 446.29 per month, compared to the R2979.79 of non-homeland households. This clearly shows that most non-homeland farming households had greater access to salary income, while homeland households were highly dependent on government social grants, i.e. an average of R1 000 in total grants per month, with two recipients, while the average non-homeland households received a grant of R631.01 per household. In general, the sources of income in homelands can be classified as, first, government grants at 49% of African farming households, second salaries, at 24%, and third remittances, at 16% (Pienaar & Fintel, 2013:13). The composition of the grants was mainly old age grants, reflecting the fact that the homelands had many elderly people and that they were providing livelihoods to the families. A remittance payment is another important source of income, which averaged at R214 for homelands households and R143 in non-homelands (Pienaar & Von Fintel, 2013:11). Farming activities themselves can therefore be considered as not sufficiently providing for livelihoods in the homelands.

Using the similar dimensions as Noble and Wright (2012), but based on the 2011 Census, Noble *et al.* (2014) measured poverty in terms of a 'multiple deprivation index'. It was found that poverty is still concentrated in the former homelands. Deprivation rates for the rest of South Africa were found significantly lower than the average for the former homelands, with only 28% (against 74%) of the population

being deprived in the living environment domain, 18% (against 28%) in the education domain, 30% (against 54%) in the employment domain and 33% (against 46%) in a situation of material deprivation. This gives an indication that former homelands were still more deprived than the rest of South Africa. Using income poverty, and taking into account the lower-bound poverty line, the former homelands had an average poverty rate of 73%, compared to 46% for the rest of South Africa. This is a wide gap. However, using the deprivation gap in the period 2001-2011, there was a narrowing of the gap when compared to the rest of the country (Noble & Wright, 2012; Noble *et al.*, 2014).

These findings indicate that there is need to give priority to former homelands when implementing efforts to alleviate multidimensional poverty in South Africa. Otherwise history might repeat itself as far as spatial is concerned in homelands in the future. More research is needed on the on multidimensionality of poverty, using all kinds of methodology in the former homelands, which will not only help in providing an in-depth understanding, but will also raise the awareness of issues depending on dimensions when being compared to the rest of South Africa.

3.7 SUMMARY AND CONCLUSION

Poverty has remained topical in international development policy efforts, particularly in the developing world. It is much more topical in the South Africa context due the legacy left by the apartheid system. One of features of this system was a procedure of active dispossession, whereby assets, such as livestock and land, were confiscated from the majority black people.

Poverty conceptualization, definition and measurement in a society appear to be a mirror image of the standards of that society. The concept of poverty should be adapted according to the appropriate context, as there is no common concept that is believed to hold the meaning of poverty for all countries at all times. Apart from the technical concepts and definitions of poverty discussed in the previous chapter, in the current chapter it has been important to take into account the way poor South African people themselves perceive poverty. Poverty, like beauty, lies in the eyes of

the beholder. In South Africa, the poor characterize poverty as isolation from the community, a lack of security, low wages, a lack of employment opportunities, poor nutrition, poor access to water, having too many children, poor education opportunities and the misuse of resources.

In chapter 3, the history of poverty research in South Africa has been discussed. It was stated that investigation of poverty levels among the South African population is not a new exercise. The poverty condition among the South African white population was highlighted in the First Carnegie Commission Inquiry into Poverty, when investigating the so-called 'Poor White Problem'. The report, entitled 'Carnegie Poor White Study, subdivided into a set of five reports, including economic, psychological, educational, health and sociological reports, and was published in 1932. The Commission distinctly recognised the multidimensional nature of poverty, even if they did not produce an index of multidimensional poverty. Fifty years later, the Second Carnegie Inquiry into Poverty and Development in Southern Africa was undertaken. Unlike its predecessor, the second study examined the effects of poverty in all groups residing within the southern African region, including Botswana, Lesotho and Namibia. The Second Carnegie inquiry appeared with a concept of poverty that had many numerous facets, including hunger, illness, unemployment, widespread inequalities and lack of adequate fuel. Black African poverty was found to be far more devastating and far more extensive than that of anybody else. The Second Carnegie Commission Inquiry into Poverty in South Africa was followed by the 1993 PSLSD, which was considered to be the first nation-wide, representative household survey in South Africa. After 1994, the government invested in poverty data collection and a series of important reports on poverty were commissioned, where a series of public strategies were reoriented around developmental issues.

Studies that investigated poverty in South Africa fitted into two categories, those which explored poverty in terms of income or expenditure and those which considered the multidimensionality nature of poverty. They therefore considered different dimensions of deprivation. The poverty rankings by race were totally robust, looking at the 1993 SALDRU survey and 1995 IES. At any poverty dimension and any poverty line, Africans were found to be much poorer than Coloureds, who are

very much poorer than Indians/Asians, who are poorer than whites. Female-headed households have a far higher rate of poverty compared to male-headed households, while a higher proportion of the poor population live in rural areas compared to urban dwellers. The distribution of unemployment indicated that the highest unemployment rate was among the poor, especially poor blacks, followed by Coloureds. In general, from 1993, income poverty has dropped and a large decrease in overall multidimensional poverty in South Africa has been noticed.

Even though some multidimensional poverty measures are trying to reach agreement on just determining what basic needs are, there is still a necessity for considering more than just fulfilling the basic needs. The effect of equal and unequal access to resources, in addition to the study of the poverty or deprivation, was discussed in this chapter. Inequality matters for poverty. The problem of high inequality inherited from apartheid has continued to dominate the economic strategic efforts of the post-apartheid government, where South Africa's income inequality levels are among the highest in the world with a Gini coefficient at around 0.70 in 2013. The intra-racial dynamics are influential, where the African group has the highest inequality and, as a result, influences the aggregate changes in inequality.

Unemployment and education were described to be at the base of causes of poverty and inequality in South Africa. From the poor's own perspective, through the interviews conducted by the South African National Development Agency (NDA), the key determinant of poverty was recorded to be education, which immediately associates with employment status. Many poor people have no physical assets, neither a small farm nor a small industry. They are the landless or urban poor. The only asset they possess is their own two hands and their willingness to work. In such a situation the best investment is in human resource development. South Africa has one of the highest unemployment rates and one of the lowest labour force participation rates and exhibits one of the highest income inequities in the world. Unequal distribution of education, both in quantity and quality, is perceived as an accelerator leading to inequality in labour market earnings, and as a major factor in the intergenerational transmission of inequality. Education has the potentiality of being a policy tool that can simultaneously decrease inequality and lift mean income.

It is appropriate that public policy should target the reduction of poverty and inequality, proceeding from the understanding that the reduction of poverty may not necessarily result in the reduction of inequality.

Chapter 3 has reviewed the poverty literature on the former South African 'homelands'. These 'homelands' were established in 1951, under the Bantu Authorities Act, and were established for black Africans. There were ten homelands that were established, namely, Transkei, Bophuthatswana, Ciskei, Venda, Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa and Qwaqwa. In terms of land quality, most homelands were not only geographically fragmented, with poor infrastructure between them, but had poor land quality not suitable for agriculture because of its mountainous nature, which was aggravated further by poor rainfall. Most homelands could not offer a variety of employment opportunities, as they contained very few towns and in some cases no cities at all. The social and economic conditions within the black homelands were exceptionally harsh, by any standards. In general, there was poor infrastructure development and welfare services, coupled with high levels of poverty, which made the homelands have very low standards of living compared to most parts of South Africa.

Numerous studies in former South African homelands revealed that poverty is concentrated in the former homelands. Deprivation rates for the rest of South Africa were found to be significantly lower than the average for the former homelands. On average, the population in the former homelands was more advanced in age with low levels of education. Most households were headed by females. In terms of income, most homelands households had lower average income levels, with critical differences compared to non-homeland households.

This chapter explored poverty studies in South Africa, where different measures and methodologies have been followed. The next chapter discusses the methodology which is followed in investigating the multidimensional poverty in a South African semi-rural township. The methodology that will be followed in the present study differs from those used by the discussed previous multidimensional poverty studies.

It will go deeper, by showing how to determine not only the incidence and intensity of poverty but also the depth and severity of poverty.

CHAPTER 4: RESEARCH METHODOLOGY AND DESIGN

4.1 INTRODUCTION

This chapter discusses the research design and methodology to be followed in investigating the multidimensional poverty in a former South African homeland. A research design is a framework or plan for a study used as a guide in collecting and analysing data (Gilbert & Churchill, 1996:11436; Hair *et al.*, 2013:36). It is the blueprint that is followed in completing a study. A well-defined research design ensures the effectiveness and efficiency of the research project and includes the following tasks: the specification of the sampling process and sample size, the design of the questionnaire, the specification of the measurement and scaling procedures and the development of a plan of data analysis.

Research methodology is a scientific way to systematically solve the research problem (Kumar, 2008:5). It includes the research methods but explains the logic behind the research methods used. The reasons why some methods and techniques are selected to be followed in collecting and analysing data in the present study are discussed in this chapter. The chapter further discusses the type and description of data used in the study including, its justification.

4.2 SAMPLING PROCESS

There are five steps in the sampling design process, according to Malhotra (2010:372). These steps are the definition of target population, the identification of the sampling frame, the selection of a sampling procedure, the determination of the sample size and the execution of the sampling process. These steps are closely interrelated and relevant to all aspects of the research project, from problem definition to the presentation of the results.

4.2.1 Target population

The sampling process begins by specifying the target population, which is the collection of elements that possess the information sought by the researcher and about which inferences are to be made (Malhotra, 2010:372). In order to identify the

source of data accurately, it is vital to carefully define the target population. This entails translating the problem definition into a precise statement of who should and who should not be included in the sample. The target population is defined in terms of elements and sampling units, extent and time (Hair *et al.*, 2002:328, Malhotra, 2010:372; Taylor-Powell, 1998:2). In the current study, the target population is households (sampling units) that are based in South Africa, in the Free State province, Maluti-a-Phofung Local Municipality, Qwaqwa in 2015. The research is conducted on all household members. This makes the sampling units the same as the elements.

4.2.2 Sampling frame

A sampling frame is a representation of the elements of the target population. It consists of a list or a set of directions for identifying the target population (Malhotra, 2010:373). The list rarely matches the target population exactly (Proctor, 2000:89). For example, a list of residents of a given area does not include new arrivals or households living in dwellings built after the last list was compiled. A set of direction was used in the case of this study, where sampling units (households) were identified individually from the map of Qwaqwa before the beginning of the survey. Where households' members were not available for an interview, or where it was not possible to locate the selected house, a next pre-selected household was used.

4.2.3 Sampling techniques

Sampling technique refer to the method used in selecting the sample units. Sampling techniques are divided into two major categories of probability and non-probability samples (Coldwell & Herbst, 2004:79; Gilbert & Churchill, 1996:479; Hair *et al.*, 2013:38; Proctor, 2000:91; Zikmund, 2000:65). Probability samples comprise samples in which the elements being included have a known chance of being selected. The chances of each member of the population being included in the sample may not be equal, but everyone has a known probability of inclusion. With non-probability samples however, there is no way of estimating the probability that any population element will be included in the sample. They rely on personal

judgement somewhere in the sample selection, rather than on a mechanical procedure to select sample members. The participants are selected in a purposeful way. While the judgements may sometimes yield good estimates of a population characteristic, there is no way of determining objectively if the sample is adequate. It is only when the elements have been selected with known probability that one is able to evaluate the precision of a sample result (Gilbert & Churchill, 1996:480). It is for this reason that probability sampling is mostly considered to be superior (Gilbert & Churchill, 1996:480) and it is the one which is undertaken in the present study to sample the target population. Probability sampling includes simple random sampling, systemic sampling, stratified sampling and cluster sampling. The simple random sample is used in this study, because it is the most acknowledged probability sampling, through which every element of the population has an equal chance of being selected and every combination of population elements is a sample possibility (Coldwell & Herbst, 2004:80; Gilbert & Churchill, 1996:487; Zikmund, 2000:65).

4.2.4 Sample size

Sample size refers to the number of elements to be included in the study (Malhotra, 2010:374). It is difficult to conclude that the sample is too large or too small (Kinnear & Taylor, 1991:396). It is argued that the larger the sample, the higher the chance of the research being precise (Zikmund, 2000:64). Zikmund stated that if appropriate probability sampling is applied, a small number of the whole population may provide a reliable measure of the entire population. There are, however, important factors that should be considered in determining the sample size. These include the nature of the research (i.e. descriptive analysis) and analysis (i.e. multivariate analysis), sample sizes used in similar studies, completion rate and resource constraints (Malhotra, 2010:374). Sample size is influenced by the average size of samples in similar studies, where their sample sizes were determined based on experience and they can better serve as rough guidelines, particularly when non-probability sampling techniques are used. In this study a sample of 404 households was randomly selected in eight villages of Qwaqwa, to meet the analytical needs of this study. These are Kudumane village, with a sample of 46 households, 42 households for Boitekong village, 43 households for Mphatlalatsane village, 42 households for

Mabolela village, 44 households for Ntshehele village, 42 households for Qholaqhoe village, 99 households for Bochabela village and 46 households for Matsikeng village. A similar range of sample size was analysed by Case and Deaton (2009) in their analysis of health and well-being in Khayelitsha Township and by Sekhampu and Dubihlela (2012), in Bophelong Township, studying the impact of rising food prices on households in a low income township in South Africa.

4.2.5 Execution of the sampling process

A sample of 404 households was randomly selected to meet the analytical needs of the study. The target population are households based in the former homeland of Qwaqwa in South Africa. In order to collect the necessary data, a survey questionnaire was undertaken. Structured face-to-face interviews with participants in their own households was undertaken by field workers. During the survey interviewers read the questions aloud and wrote down the answers given by interviewees. The fieldworkers were well trained in conducting the interviews. They were also made aware that the people to be interviewed were probably not conversant in English, so they had to be able to translate the questions in the language understandable to the interviewee. Households to which the questionnaires were administered were pre-selected from a map.

4.3 QUESTIONNAIRE

The survey questionnaire was developed after a literature review of similar research projects (Alkire & Seth, 2009; Battiston *et al.*, 2009; Basarir, 2009; Ferreira & Lugo, 2012; Klasen, 2000; Noble *et al.*, 2006; 2010; Salazar *et al.*, 2013; Santos & Ura, 2008). The questionnaire included eight sections, allowing for enough information to attain the objectives of the study. The first two sections of the questionnaire covered different aspects of households' socioeconomic and demographic characteristics, such as household size, gender distribution, household structure, education attainment, employment status and income. The third section of the questionnaire covered the household expenditure, especially from the point of view that consumption is the most used poverty indicator, as it is said to better reflect the

concept of permanent income of a person (as discussed in the second chapter section 2.5.1). The fourth section was concerned with household housing and clothing characteristics, while the fifth section had questions about access to assets. The sixth section was concerned with water and sanitation of households, while the seventh section included questions assessing the air quality in terms of fuel for lighting, fuel for cooking and fuel for heating. The last section, section eight, investigated the time used to get to the nearest clinic or hospital, using the usual means of transport. The section included a Household Food Insecurity Access Scale (HFIAS), as issues under food insecurity are closely related to health in the study. These sections cover some dimensions of multidimensional deprivation and will be discussed in the next subsection, where every indicator (question) of poverty and the reason of its inclusion will be dealt with.

4.3.1 Dimensions of deprivation

The selection of dimensions was based on several factors. These included dimensions used in MPI and in a number multidimensional poverty studies which have been done internationally (Alkire & Seth, 2009; Battiston *et al.*, 2009, Ferreira & Lugo, 2012; Salazar *et al.*, 2013, Santos & Ura, 2008) and nationally (South Africa) in particular (Basarir, 2009, Klasen, 2000; Noble *et al.*, 2006; 2010). In the applied work, there is no common list of dimensions to be included in a study, as there are none in the fundamental theoretical framework of Sen's capability approach. This gives the advantage of selecting specific dimensions to each case study. However, it has been regarded as a disadvantage, because it renders the comparisons less meaningful.

Seven dimensions of deprivation that could be constructed, based on 18 indicators, were identified. These dimensions were education, housing and clothing, water and sanitation, assets, air quality, income and health. Following the framework of the Alkire and Foster method of dual cut-offs, there will be two thresholds, both within and between indicators. Every question of the survey questionnaire has several answer options. Every option is denoted as either deprived or non-deprived, looking

up to the cut-off within indicators of each dimension. By using indicator particular cut-offs, households are categorised as either deprived or non-deprived in that indicator.

4.3.1.1 Education

Education is generally recognised as a relevant dimension in understanding poverty (Vijaya *et al.*, 2014:11). It is also the second goal of the MDGs adopted by the United Nations (UN) (to achieve universal primary education). As a central capability, education has not only intrinsic but also instrumental function in developing the wellbeing of people (Naveed & Tanweer-ul-Islam, 2010:15). It has an ability to empower people to participate in the socioeconomic and political fields of their lives. There is a close connection between educational attainment, the type of work an individual is engaged in and the associated earnings potential. Better educated people have a greater probability of being employed than less educated (van der Berg, 2008:3). They are economically more productive and have higher bargaining power. It is therefore relevant to incorporate education as an essential dimension for multidimensional poverty measurements.

The purpose of this dimension is to capture the extent of deprivation in educational achievement in Qwaqwa, where the individual's own level of education is considered. Referring to the second goal of the MDGs, the first indicator has been created by considering the mean of the years of education of the household members over 16 years (included). The cut-off was Grade 7/Standard 5, representing the completion of primary school. This indicator is vulnerable to the case where a student repeats a year of primary education. The current study therefore took into account household members over 16 years instead of 13 years, which is the commonly completion age of primary education. In terms of the threshold utilised, a household is judged deprived when the average years of schooling of its members aged 16 and above is below seven years of schooling. Even though there might be a number of illiterate members in the household, the average years of schooling was chosen to be used in this study as the distribution of literates across household matters. This is due to the external effects of literacy and

the benefits that illiterate members of a household gain from possessing a literate individual in the household (Basu *et al.*, 2000:2).

Households with illiterate people are vulnerable compared to households without any illiterate people. Suppose that a medical facility is set up in the neighbouring village. The staff distribute pamphlets on methods of preventing disease and infection, as well as information on the various services offered by the facility. This kind of information is very important for the household but if the literate person is not available for different reasons (travelling, sickness) the whole household would be in danger. Consequently, the next indicator is defined as the percentage of people aged 16 or above in the household that know how to read and write. A household is considered deprived if at least one of the household members aged 16 or older does not know how to read or write (i.e. less than 100% of its members 16 years old and over are able to read and write). When there are no household members aged 16 years old or over, the household is considered deprived (Salazar *et al.*, 2013:11)

4.3.1.2 Housing and clothing

This dimension is concerned with housing and access to decent clothing. Housing is a crucial indicator, as it is perceived to be a potential social class indicator which influences the safety and health of household members. Possessing data on the quality and condition of the floor material, walls and roof material of the dwellings is more relevant than analysing the type of the house as a whole. Details of the dwelling quality were taken into account in order to avoid some discussion whether an individual residing in a traditional dwelling should be categorised as deprived, along with an individual residing in a shack. Indicators of dwelling quality are informative for both housing deprivation and vulnerability to shocks, including weather conditions (Bhorat *et al.*, 2004). A household is identified as deprived in terms of the main material used for the floor of the dwelling, bricks, mud/dirt or dung. It is deprived if the main materials used for the walls are corrugated iron/zinc, wood/plastic, stone with mud, unbaked bricks with mud, straw with mud, cardboard or re-used wood (Basarir, 2009:8). In terms of the material and condition of the roof

of the dwelling, households with plastic/thatch/wood and a leaking roof are also considered deprived.

Crowding is an objective measure of the number of persons per room in the dwelling (Webber, 2009:5). Gray (2001) revealed that crowding has an effect on physical and mental health. It is also thought that people living in crowded situations frequently have lower-paying jobs, lower personal incomes, higher unemployment and greater reliance on income support than those in less crowded conditions (Statistics New Zealand, 1998). There is no specific standard set for identifying crowding dwellings. However, the present study follows StatsSA (2004), which fixed the number at three or more people per room in the South African situation. The choice of this standard is supported by the fact that the calculation of the number of persons per room is not based on bedrooms only, but also living rooms. It excludes the storage rooms, garages, bathrooms, toilets, kitchens and rooms for business. The studies of Noble *et al.* (2006) and Bhorat *et al.* (2004) in South Africa considered two or more people per room as a measure of overcrowding.

Access to decent clothing as one of general protection items was included. Decent clothing is one of the items that are given a high degree of importance in South African household. After food, the item that income is spent second most on per month in Free State province is clothes, taking a share of 27.9% of the monthly expenditure (Meyer, 2013:220). Access to decent clothing for different climatic conditions is essential to keep people comfortable. For measuring this indicator, participants were asked “over the last year, how often, if ever, have you or your family gone without enough decent clothing”? The answer options were ranged from 1 (= never) to 5 (= always). The high value indicates the great level of lack of access to what the participant believes to be decent clothing. They are deprived households if at least one member has gone several, many times or always without decent clothing over the 12 month prior to the survey.

4.3.1.3 Assets

The asset is the most-used dimension for its usefulness in overcoming the complete market assumption. This function in developing countries might not be necessarily realistic (Basarir, 2009:18). In the present study, a number of assets have been recorded, but they are grouped according to their function.

Cellphone/landline telephone ownership is an indicator that portrays the essential communication needs of the household. Owning either a cellphone or a landline telephone that is available for the household members for communication purposes is an element of the broader goal (no. 8) of the MDGs: “developing a global partnership for development” (UN, 2003:90). In South African, some households do not own either a cellular phone or a landline telephone, although the proportion of households with a cellular phone has risen significantly in recent years and frequently holds preference over a landline (Noble *et al.*, 2006:23). Consequently, it is crucial to incorporate a measure of lack of access to a telephone.

The ownership of radio/television was also considered. Possessing of one or both of these items to ensures that the household has access to recent news and information at least via one source. The analysis of the present study emphasises capabilities rather than resources. Therefore, cellphone/landline telephone and radio/television were taken to be two separate indicators, apart from other indicators, as they guarantee communication, information and entertainment.

Other types of assets are taken to be one indicator, since the main emphasis of the study is on capability. These include a refrigerator, microwave, dishwasher, washing machine, computer (laptop/desktop), car in working condition, motorcycle/scooter, bicycle, house and livestock. Asset portfolios exhibit both past and future income-generation opportunities throughout their contribution to livelihood choice, and the potential for participating in financial markets, generating rents, interests on savings and profits from business (Vijaya *et al.*, 2013:11). Assets can offer a safety net in periods of economic crises, through their sale or pawning, in order to deal with the income shortage. Carter and Barrett (2006) were of the opinion that households with

few or no productive assets are typically more vulnerable to chronic poverty than households that own a certain level of these assets but face income fluctuations. While the list of assets used in this study might not absolutely seize the poverty level of households, it can clarify whether or not a household is 'non-deprived'.

As some of the items included are luxuries, it is unlikely that poor households would have them. Therefore a household possessing at least one item of included assets would be categorised as non-deprived in this indicator. It is important to note that the included list of assets is not a definitive analysis at this stage. A definitive analysis would entail a refined list of items, sensitive to the income level of the household, in order to generate an index of assets based on index score of each item (Naveed & Tanweer-ul-Islam, 2010:17). This, lies beyond the scope of the present study.

4.3.1.4 Water and sanitation

The dimension of water and sanitation indicates the accessibility of safe drinking water sources, adequate sanitation facilities and sewage disposal (solids), in ensuring the wellbeing of the household. The access to safe drinking water and adequate sanitation are part of the MDG initiatives, which list the 'access to an improved water source' (UN, 2003:64) and 'improved sanitation' as indicators of the MDG's Goal no. 7 ('ensure environment sustainability') (UN, 2003:66). Sewage disposal is closely related to the MDG's Goal no. 7.

A source of drinking water is vital for health and its locality may shape the distribution of duties of the household members, especially children and women. The inclusion of the locality aspect in this case not only represents the hygienic perspective when transporting water but also denotes empowerment as one element of capabilities. For instance, children who have to go to fetch water from far away would use the saved time as an opportunity to attend full-time education, while women could have the extra time devoted to employment. The present study has followed Statistics South Africa (StatsSA, 2014c:6) in deriving the deprivation cut-off where the deprived will be those households with no piped water in the dwelling or on the stand.

The type of toilet available to the household is a very important indicator for sanitation. The type of toilet facility has stimulated a great deal of debate. Originally, the indicator was considering the number of individual staying in households without a flush toilet. However, it was indicated that a number of RDP houses are being built with pit latrines with ventilation. It was concluded that pit latrines with ventilation would be considered as an improved toilet facility (Noble *et al.*, 2006:23). Therefore households with pit latrines with ventilation would be categorised as non-deprived in this study.

Solid sewage disposal is a vital indicator for the overall hygiene and is an indicator that could be recorded as public service in South Africa. Human being and the act of production and consumption go hand-in-hand. In utility maximisation process there are always unavoidable externalities, namely wastes. The way wastes are carried, stored and disposed of can endanger the environment and public health (Free State PSDF, 2013:41). This indicator corresponds therefore to MDG's seventh goal: 'ensure environment'. In terms of solid waste the cut-off distinguishes between households that are served by the local authority or private company once a week and those that are not.

4.3.1.5 Air quality

Electrification is an important indicator of air quality in the household. In South Africa, the post-apartheid era manifests a process of a fast extension when it comes to the utilisation of electricity as a better energy source for lighting (Bhorat *et al.*, 2004:9). As a result, in the South African context, lack of electricity for lighting has to be regarded as a deprivation. The electricity indicator cut-off is a straightforward procedure since the data is implicitly dichotomised. Either the household is connected to the main source of electricity or not.

Cooking and heating fuel is also considered an indicator of air quality in the multidimensional framework as a tool value towards health. The kind of fuel utilised for cooking or heating is consequential for household health, especially for females who are almost absolutely concerned with cooking. If wood/straw, coal/charcoal or

paraffin are used for cooking or heating, the health of household members who breathe regularly in that kind of environment could be harmfully affected. Furthermore, cooking and heating fuel effects the environment. Some of these alternative fuels for heating or cooking can be connected to deforestation and soil erosion (Basarir, 2009:16) where the seventh goal of MDGs ('ensure environmental sustainability') would be violated. This study considers households that use electricity or LPG/natural gas as being non-deprived. Bhorat *et al.* (2004) pointed out, however, that, to a large extent, the choice of fuel for cooking may depend on cultural preferences instead of availability of electricity even if the affordability, availability and effectiveness also remain important factors.

4.3.1.6 Health

The health dimension is an essential dimension which is captured by proximity of the household to the nearest clinic or hospital and the food security of the household. The criterion of access to the nearest hospital or clinic by the usual means of transport within 30 minutes was used by Basarir (2009:18), in the South African context. This, of course, does not mean that, in a case of emergency, the household will use the facility, but at least it is known that they have it.

The second indicator of the health dimension is concerned with food security, which that corresponds to the MDG's first goal, namely 'Eradicate extreme poverty and hunger'. In order to identify households that are not food secured, a Household Food Insecurity Access Scale (HFIAS), developed by the USAID, was used. The HFIAS consists of two sub-questionnaires, including nine occurrence questions which consider two response choice 'yes' or 'no', and nine frequency-of-occurrence questions. The former are used to make a follow-up to the occurrence question and determine if the situation (food insecurity) ever occurred. Following a 'no' answer option, there is a skip code, where the interviewer skips the corresponding frequency-of-occurrence follow-up question (Coates *et al.*, 2007:2). The HFIAS score is computed utilising the responses on the basis of the nine frequency-of-occurrence questions. Participants use an ordinal level response scale, with the following options: 'never', 'sometimes' and 'often' receiving a score of 1, 2 and 3 respectively.

The higher the score the higher the likelihood of being food insecure (Coates *et al.*, 2007:18).

4.3.1.7 Income

Incorporating income in the multidimensional poverty measure has been suggested by several researchers (Basarir, 2009; Santos *et al.*, 2010; Naveed & Tanweer-ul-Islam, 2010) as a way to incorporate material hardship and the ability to attain a minimum basket of goods and services. As mentioned earlier in Chapter 3, there is no national or generally agreed poverty line. Following StatsSA (2012a:7), a lower-bound and upper-bound poverty line of R416 and R577 respectively, were selected as a basis of computing the income poverty line of the study. Adjusted to the inflation rate of 6.2% (2010), 3.8% (2011), 5.8% (2012), 4.5% (2013), 4.8% (2014) and 4.9% (2015), the poverty lines of R557, and R773 for lower-bound and upper-bound, respectively, are computed. The use of a household poverty line in the study entails first its calculation per household and household income is then compared to the corresponding individual household poverty line. The individual household poverty line provides an objective comparison as household's sizes and make-up differ from one household to another. This is unlike the use of the conventional practice, where household consumption provides the basis where the number of people living in a particular household is divided into the respective household consumption expenditure, leading to what is called *per capita* consumption.

4.3.2 The household as the unit of analysis

The unit of analysis of multidimensional poverty in Qwaqwa is on the household level. This means that the deprivations are simultaneously experienced by all household members rather than isolated individuals. For instance, if lack of enough decent clothing to at least one member of the household is a deprivation, it is assumed that this deprivation impacts not only upon the individual who does not have enough decent clothing, but to the whole household. This implies that all other people living in the same household are regarded as deprived with regard to this indicator. This is on the basis that household members are likely to respond to

shocks of life with a combined effort and also among the extended families which provide a social protection network when dealing with such an adverse event (Salazar *et al.*, 2013: 9). Despite such linked social networks, the poverty trap also becomes shared.

The use of monetary poverty measures, by assessing household-based multidimensional poverty, provides consistency with FGT poverty measures, as they most often use the household-based measures of income, consumption or expenditure. This provides easy comparability. This is unlike the use of an individual as a unit of analysis, as the same household would show both deprived and non-deprived individuals, hence poor and non-poor people within the same household. This can complicate the use of an index on policy intervention and monitoring (Salazar *et al.*, 2013:9-10).

4.4 STATISTICAL ANALYSIS: ALKIRE AND FOSTER METHODOLOGY

The analysis of the current study was conducted using a series of methods of statistical analysis. The identification and aggregation of the poor was conducted mainly based on the Alkire and Foster family of measurement, while the comparison of multidimensional poverty and income poverty was based on Spearman correlation.

Using the dual cut-off approach, previously explained (Chapters 1 & 2), for the identification and aggregation of the multidimensionally poor, Alkire and Foster (2011b) propose the dimension-adjusted FGT measures that are explained step by step as a methodology, in the next subsection. Suppose that that a series of dimensional variables has been chosen and data are presented in the form of $(n \times d)$ data matrix Y for n individuals and $d \geq 2$ dimensions.

4.4.1 Identification

In a multidimensional measurements setting, where a number of dimensions are involved, the identification of the poor is not straightforward, as it is in the case of unidimensional analysis. In the latter, identification is generally achieved on the basis

of a poverty line, whereby individuals whose resources fall short of the poverty line are considered poor. In the former, however, the dual cut-off has to be followed in order to identify who is multidimensionally poor (Alkire & Foster, 2011b:478). Those are deprivation cut-off and poverty cut-off.

Deprivation cut-offs: A vector $z=(z_1, \dots, z_d)$ of deprivation cut-offs. Each dimension has its corresponding cut-off that is employed to capture whether or not an individual is deprived in the particular dimension. In other words, if the individual's attainment level in a given dimension j falls below the corresponding deprivation cut-off z_j , the individual is identified to be deprived in that particular dimension. If the individual's level is at least as great as the deprivation cut-off, the individual is regarded as not deprived in that particular dimension. Deprivation cut-offs of the study were explored in section 4.3.1 of this chapter.

Weights: A vector $w = (w_1, \dots, w_d)$ of weights or deprivation values is used to denote the corresponding importance of the various deprivations. In the case where dimensions are equally weighted, all the weights are one and sum to the number of dimensions d . If dimensions are not equally weighted, this is indicated by a vector whose entries sum to d but can vary from one, with greater suggesting weights, indicating higher importance. It is important to note that the weighting structure has influence on the identification in defining the minimal combinations of deprivation which will characterise an individual as being deprived. It also has an impact in aggregation by changing the corresponding contributions of deprivation to the general poverty. In the current study, the identification of households deprived in multiple dimensions and poverty rates are given based on equal weights for every dimension. It is important to note that none of the weighting methods is exclusively self-sufficient (Decancq & Lugo, 2008:23). The Alkire and Foster method provides a more flexible framework, which allows users to set equal or different weights. Despite the equal weights provided in the present study, some dimensions in the study, as a matter of exploring further the flexibility, are provided with double weights and these include education, health and consumption. The basis is on the mere fact that the three dimensions are exceptionally important, as they are components of the HDI (UNDP, 2010:13).

Deprivation counts: A column vector $c = (c_1, \dots, c_n)'$ of *deprivation counts* indicates the extent of every individual's deprivation. The i^{th} individual's deprivation count c_i is the number of deprivations suffered by i (in the case of equal importance of deprivations), or generally the sum of the weights of the deprivations suffered by i .

Poverty cut-off: A poverty cut-off k fulfilling $0 < k \leq d$ is employed to establish whether or not an individual has the necessary deprivations to be judged poor (Alkire & Foster, 2011a:296). If the i^{th} individual's deprivation count c_i falls short of k , the individual is not regarded as poor, but if the individual's deprivation count is k or over, the individual is regarded as poor. The sequential application deprivation cut-off and poverty cut-off in Alkire and Foster methodology refers to 'dual cut-off'. Note that when k is less than, or equal to, the minimum weight across all dimensions, the identification is said to be based *union approach*. In the case where $k=d$, the intersection identification is being applied. The deprivation count and poverty cut-off can also be expressed as percentages of d .

Identification function: The identification function summarizes the result of the aforementioned procedure and reflects whether or not an individual is poor in Y , given deprivation cut-offs, weights w , and poverty cut-off k (Alkire & Foster, 2011a:296). If the individual is poor, the identification function gets a value of 1; and 0 for otherwise.

4.4.2 Censored matrices

There is a transitional step of the investigation of the progression of matrices that should be done after the identification and just before starting the aggregation step (Alkire & Foster, 2011a:296). The *achievement matrix* Y presents the achievements of n individual in each of d dimensions. The *deprivation matrix* g^0 substitutes every element in Y that is below its corresponding deprivation cut-off Z_j with the deprivation value w_j , and every element that is not below its corresponding cut-off with zero. It gives a picture of individuals that are poor, the dimensions they are deprived in and the weights those dimensions have. The *censored deprivation matrix* $g^0(k)$ multiplies every row comprising the information of the individual is unchanged, but if the

individual is not poor the deprivational information of the individual is censored and substituted with zeroes.

If the entries of Y are all cardinally significant, then the normalized gap of an individual in a deprived dimension can be described as the difference between the deprivation cut-off and the individual's achievement, all divided by the deprivation cut-off (Alkire & Foster, 2011a:297). The *normalized gap matrix* g^1 substitutes each deprived entry in Y with the corresponding normalized gap, multiplied by the deprivation value; it substitutes each entry that is not below its deprivation cut-off with zero. The normalized gap matrix presents a picture of the depth of deprivation of every individual in every dimension, weighted by its corresponding importance. The *squared gap matrix* g^2 substitutes each deprived entry in Y with the square of the normalized gap, multiplied by the deprivation value; it replaces each entry that is not below its deprivation cut-off with a value of zero. Squaring the normalized gaps sets relatively more attention on higher deprivations.

The censoring step is important in Alkire and Foster methodology, given that the censored matrices embrace the identification step and fundamental elements in order to build the aggregation step. In the case of a *union approach*, where the cut-off k is equal to the minimum deprivation value, this step is not relevant. Any individual who is deprived in any dimension is regarded poor and both original and censored matrices are the same.

4.4.3 Aggregation

In the aggregation stage, Alkire and Foster (2011b) extended the contemporary unidimensional methodology of measuring poverty proposed by Foster-Greer-Thorbecke (1984) sometimes referred to as FGT measures. Similar to the FGT measures, Alkire and Foster measures are a family of three key measures, appropriately adjusted to account the multidimensionality of poverty (Alkire & Foster, 2011b). Each FGT measure can be considered as the average of a suitable vector made from the original data, and censored by means of the poverty line, and the

Alkire and Foster family of measures have a similar structure. These adjusted FGT measure are:

Adjusted headcount ratio: The adjusted headcount ratio is defined as $M_0 = \mu(g^0(k))$, or the average of the censored deprivation matrix. The adjusted head count M_0 indicates not only the incidence (headcount ratio) but also intensity of poverty (breadth of poverty). The headcount ratio of multidimensional poverty H is defined as the percentage of population who have been identified as multidimensionally poor, while the intensity of poverty is defined as the average deprivation share A across the poor. The intensity of poverty reflects the fraction of the dimensions in which the average multidimensionally poor person is deprived. Therefore the adjusted headcount ratio is also expressed as: $M_0 = H * A$. The M_0 satisfies the dimensional monotonicity principle, as it is sensitive to the number of deprivations the poor individual suffers. (Alkire & Foster, 2011b:479)

Adjusted poverty gap and adjusted-FGT: If all the variables are cardinally significant, then information on the depth of deprivations can be utilised to make two extra poverty measures. The adjusted poverty gap measure is defined as $M_1 = \mu(g^1(k))$, or the mean of the censored normalized gap matrix, while the adjusted FGT measure is $M_2 = \mu(g^2(k))$, or the mean of the censored squared gap matrix (Alkire & Foster, 2011a:299; Alkire & Foster, 2011b:479). The adjusted poverty gap M_1 indicates the incidence, breadth and depth of poverty. The depth of poverty is defined as the weighted average of dimension-specific poverty gaps. Simply, it is the gap G between poverty and the poverty line. It is also the product of H , A , and the average poverty gap among the poor G : $M_1 = H * A * G$. Additional to being sensitive to the number of deprivations suffered by the poor, M_1 also takes into account their depth. Therefore M_1 satisfies monotonicity. The adjusted squared poverty gap M_2 reflects the severity of poverty by emphasizing people or households that are severely deprived. It is expressed by the product of the percentage of multidimensional poor H , the average deprivation across the poor A and average squared poverty gap among the poor S (average severity of the poor): $M_2 = H * A * S$. The adjusted squared poverty gap M_2 measure is sensitive to the number of deprivations the poor

suffer, the depth of the deprivations and to the inequality of deprivations among the poor.

4.4.4 Decompositions

The useful property of decomposition of poverty, which is known in unidimensional measures, was taken into consideration by Alkire and Foster (2011b) in multidimensional measures. The decomposability property stipulates that overall poverty is a population share weighted average of subgroup poverty levels. This condition has been shown to be very important in investigating poverty by areas, by racial groups, ethnic group and by other sub-groups, classified in different ways.

A related unidimensional measure property is the *subgroup consistency*, which entails that the overall poverty, given fixed groups of population, falls with decrease in one subgroup poverty and is not changed in the other subgroups (Alkire & Foster, 2011a:300). This provides a premise for appropriate policies targeting poverty reduction, as a rise in overall poverty may also mean falling of its levels in subgroups. Both of these critical properties are upheld in the traditional FGT measures as well as the Alkire and Foster approaches. The implication is that the measure captures the mean of the censored matrix, since the mean is decomposable as population share weights across the subgroups.

Bearing in mind that the subgroup level of poverty may either be lower or higher than the overall level of poverty, this has a direct effect on the overall level of poverty which is determined by the decomposition. It should be noted that the subgroup poverty level is divided by the overall poverty level, and all is multiplied by the population share of the subgroup, which can be viewed as the subgroup's *contribution* to overall poverty. The subgroup contributions clearly sum to one. This further demonstrates that the measures exhibit a second form of decomposition, by dimension, which is applicable having defined the censored matrices. The breakdown for M_0 , is expressed in terms of the *censored headcount ratio* for each dimension, and can be expressed as the percentage of the overall population who are both poor and as deprived per the given dimension (Alkire & Foster, 2011a:300).

In other words, the dimensional decomposition formula expresses the M_0 as being equal to a weighted average of the censored headcount ratios, where the weight on dimension j is given by w_j/d . The percentage contribution of a given dimension to overall poverty is its weighted censored headcount ratio divided by the overall poverty level. The poverty decomposition in this study hence is done by villages as sub groups and household size categories. The contribution of each dimension was also broken down along the analysis.

4.5 DATA DESCRIPTION

This section provides a general description of data used in the study. The quantitative information gathered is summarised and described by using figures and tables. It discusses the description of the participants, demographic characteristics, literacy of the population and economic features of the sampled population.

4.5.1 Participants in the survey

Figure 4.1 indicates participants in the survey during the site visits. The majority of 90.48% of the respondents to the survey questionnaire were household heads while 1.98% were spouses. Children were the main participants in 6.93% of the cases, where in some cases they are living with very old people or the breadwinner lived in the area of work.

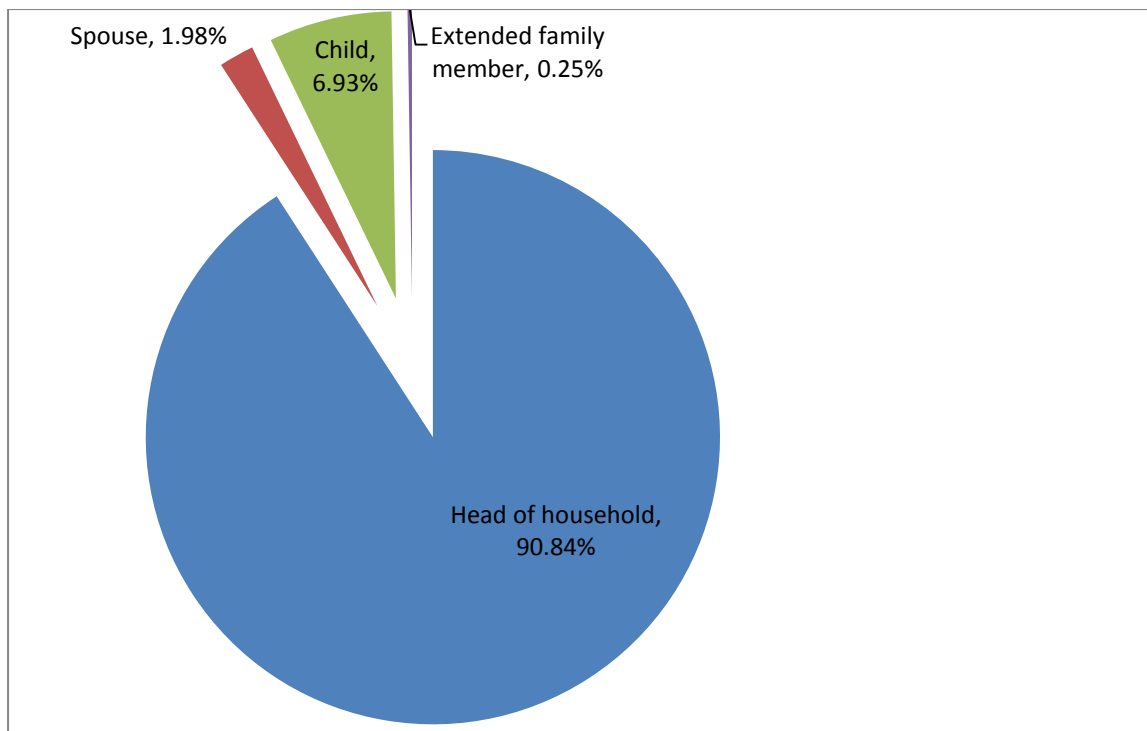


Figure 4.1: Participants in the survey

Source: Survey data (2015)

4.5.2 Demographic features

The analysis of the demographic characteristics of a region has significant implications on employment, income and household structures. In the following subsection the demographic characteristics of the sample population are portrayed from various angles.

4.5.2.1 Household size

The mean household size for Qwaqwa is 3 persons per household. This is marginally low when compared to the average household size for the Free State province (3.3) and South Africa (3.6) (StatsSA, 2012a:56). Looking at the declining trend of the population growth of Maluti-A-Phofung, from 2001 to 2011 (-0.71% p.a), it is not surprising that Qwaqwa has a lower average household size (StatsSA, 2012b:4). In addition, there is a migrant labour system, in which household members

leave Qwaqwa to work in mining areas in order to support their families, as economic activity appears to be low in the area (Department of Water Affairs, 2011:9).

4.5.2.2 Distribution of the members of the household

The distribution of household members is illustrated in Figure 4.2. It shows a higher percentage of mothers (26.04%) compared to fathers (15.97%). This higher difference between fathers and mothers can serve as an indicator of single parenting in Qwaqwa. The figure indicates a more or less equal spread of son and daughters 25.37% and 24.63%, respectively. Other relatives and any other members sharing the same household were categorised as 'Other' and counted 4.58%. In most of the cases of this category were grandchildren.

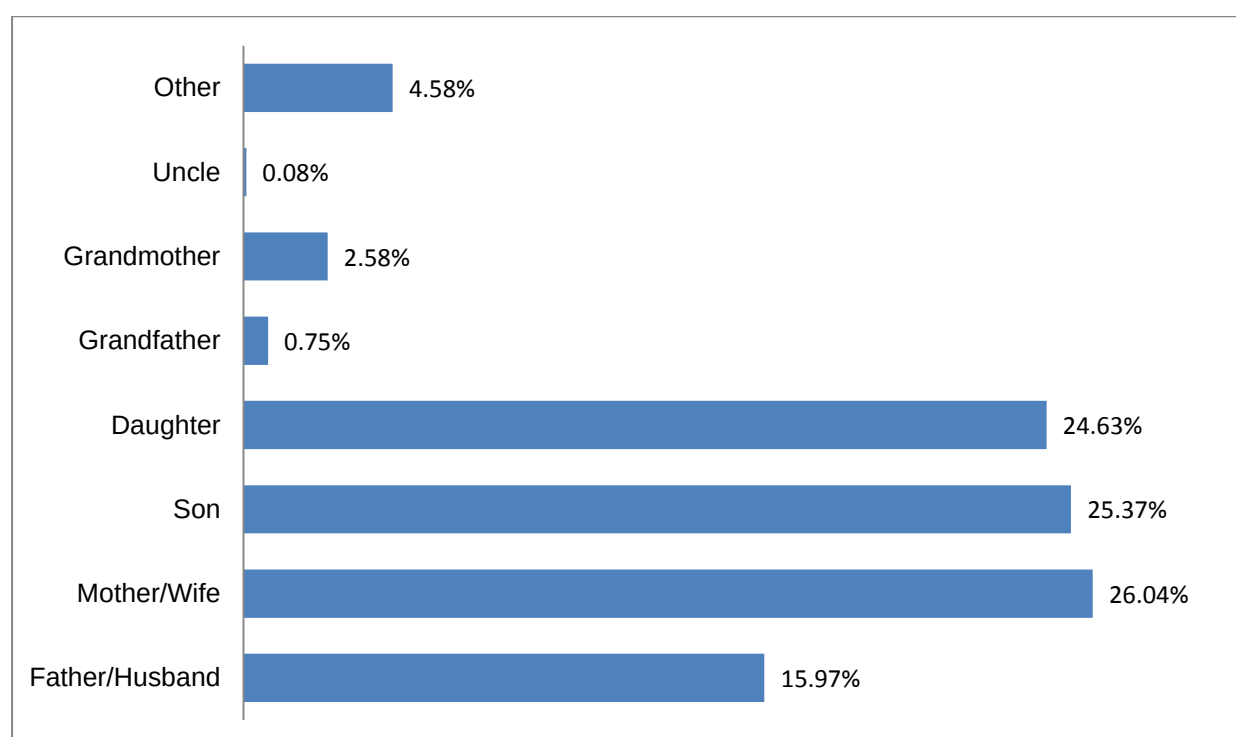


Figure 4.2: Distribution of the members of the household

Source: Survey data (2015)

4.5.2.3 Gender distribution of the population

The gender distribution of the population, as indicated in Figure 4.3, suggests that the Qwaqwa population is predominantly female. On average, the population consists of 44.59% of male and 55.57% of female. A higher percentage of female (51.18%) compared to male (48.82%) is reported on a national level (StatsSA, 2014d:2). Similarly, the population of the Free State comprises a population composition of 48% male and 52% female (StatsSA, 2013:13).

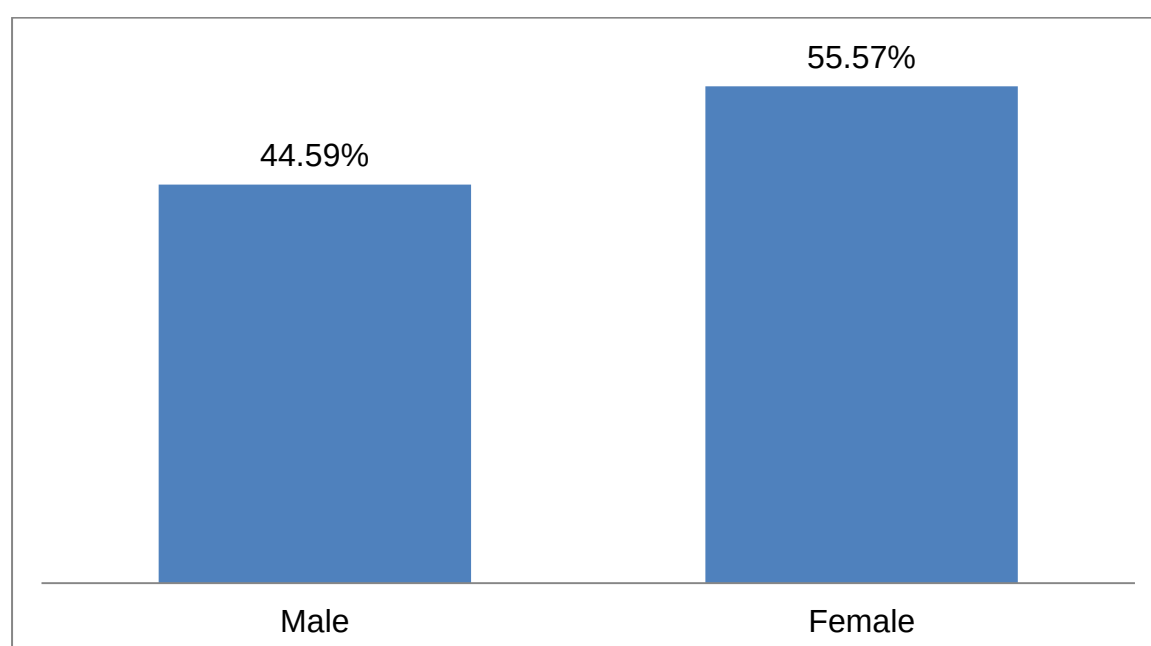


Figure 4.3: Gender distribution of population

Source: Survey data (2015)

In analysing the households by the gender of the head, Figure 4.4 shows a more or less equal spread of female-headed households and male-headed households, 49.75% and 50.25%, respectively. Among female-headed households only 8.46% is *de facto* female-headed households (husband is temporarily absent), while the majority of 91.54% are *de jure* female-headed households (male head is permanently absent; unmarried or divorced women and widows).

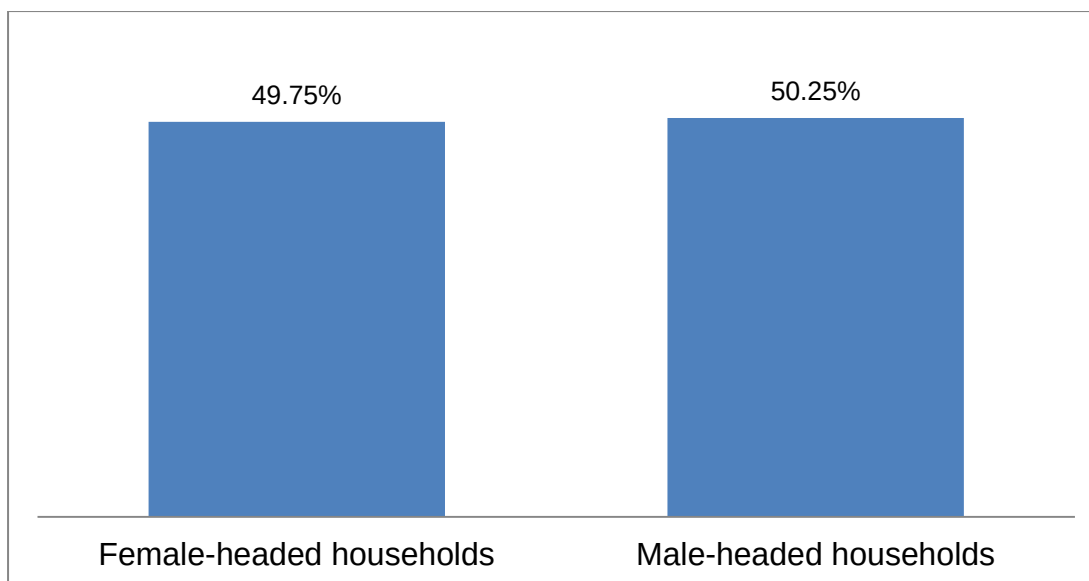


Figure 4.4: Household heads distribution by gender

Source: Survey data (2015)

4.5.2.4 Population estimates by age and gender

Table 4.1 indicates the distribution of the population of Qwaqwa by age, which is skewed towards ages between 15 and 59 and gender. The table shows that about 24.46% of the population is younger than 15 years and approximately 11.98% is 60 years or older with 63.56% between the ages of 15 and 59. Looking at the figure for the whole of South Africa, approximately 29.17% of the population is younger than 15 years and about 7.8% is 60 years or older (Stats SA, 2013:11). Comparing these two figures, Qwaqwa appears to have a higher number of older people. Similarly, the estimates of the Free State province show a higher proportion of older people (60 years or older: 8.29%) compared to the national level (StatsSA, 2013:3). Percentage for males and females aged 60 years and older is 9.93% and 13.62%, respectively, while a higher percentage of males (28.65%) is mostly concentrated in the population younger than 15 years, compared to 21.11% of female in the same age category. The female population records the majority in age category of 15 to 59 years, with 65.27% compared to 61.42% of males. StatsSA (2013:8) shows a higher percentage of female African population aged 60 and older (7.91 %) than male African population (4.74), while in the age category of below 15 years old, the

majority are African males (32%) compared to African females (30%). In the Free State province the estimates show a higher percentage of 28.60% of male population, compared to 26.79% of females who are aged under 15. Females are the majority (9.94%) compared to males (6.53%) in the age category of population of 60 years and older (StatsSA, 2013:13).

Table 4.1: Population distribution by age and gender

Age group	Male	Female	Total
0-4	7.68%	6.44%	6.99%
5 to 9	11.99%	7.63%	9.57%
10 to 14	8.99%	7.04%	7.90%
15-19	9.36%	7.19%	8.15%
20-24	8.61%	7.34%	7.90%
25-29	9.55%	9.73%	9.65%
30-34	6.74%	8.83%	7.90%
35-39	8.43%	6.89%	7.57%
40-44	4.68%	5.54%	5.16%
45-49	4.49%	8.23%	6.57%
50-54	5.06%	6.29%	5.74%
55-59	4.49%	5.24%	4.91%
60-64	2.43%	3.89%	3.24%
65-69	3.75%	3.14%	3.41%
70-74	2.25%	1.95%	2.08%
74-79	0.37%	1.95%	1.25%
80+	1.12%	2.69%	2.00%
Total	100.00%	100.00%	100.00%

Source: Survey data (2015)

4.5.2.5 Migration to Qwaqwa

Figure 4.5 shows the average length of stay in Qwaqwa. At least 32.93% of the population has moved to Qwaqwa in the last 15 years, while approximately 35.64% have been living there for more than 30 years.

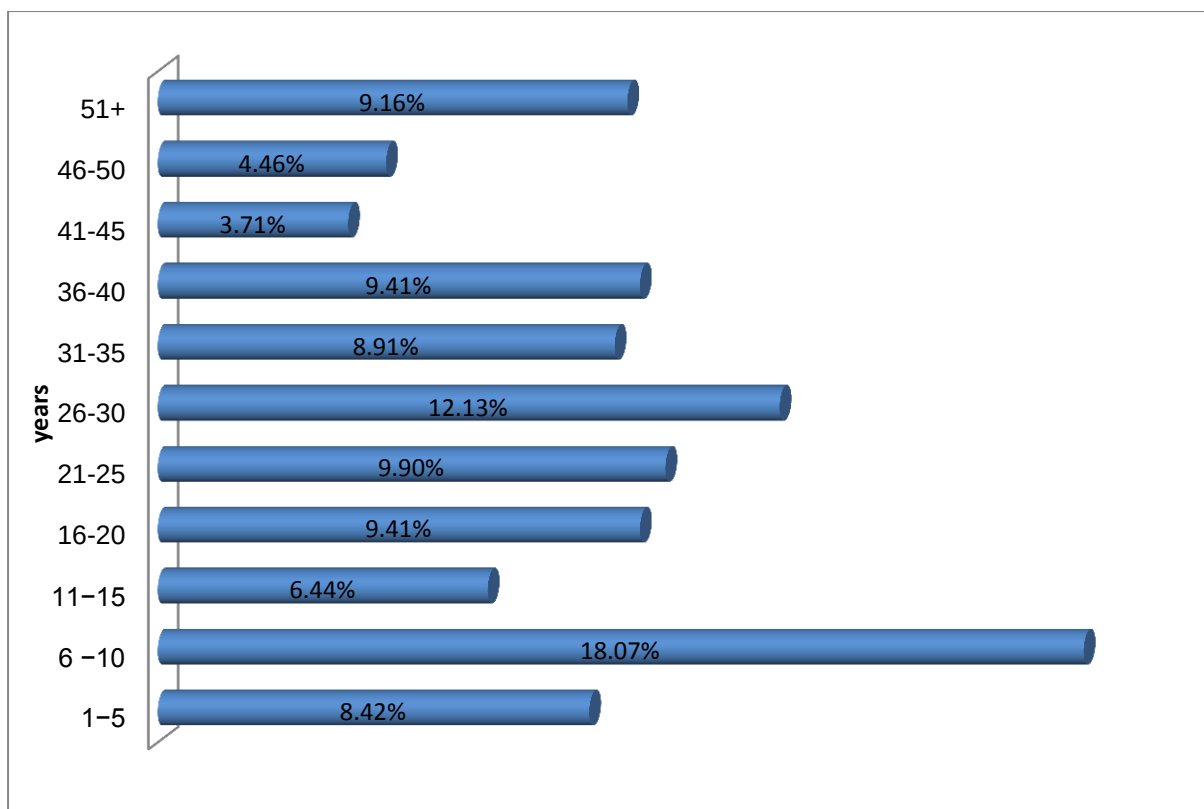


Figure 4.5: Average length of stay in Qwaqwa (in years)

Source: Survey data (2015)

4.5.2.6 Population distribution by marital status

A detailed marital status of the population is displayed in Figure 4.6. The figure indicates that 31.61% of the Qwaqwa population is made up of children (not married), while 27.54% are adults who are not married. The percentage of the population with a married status is 17.97%, with 7.65% of couples living together. Married life in the community provides a social cohesion basis and enables a mechanism through which effective planning by government can be done (Maluti-A-Phofung, 2013:26). Widows and widowers make up 10.32% of the population while those separated make up 4.16%. Divorced people make up 0.75% of the population.

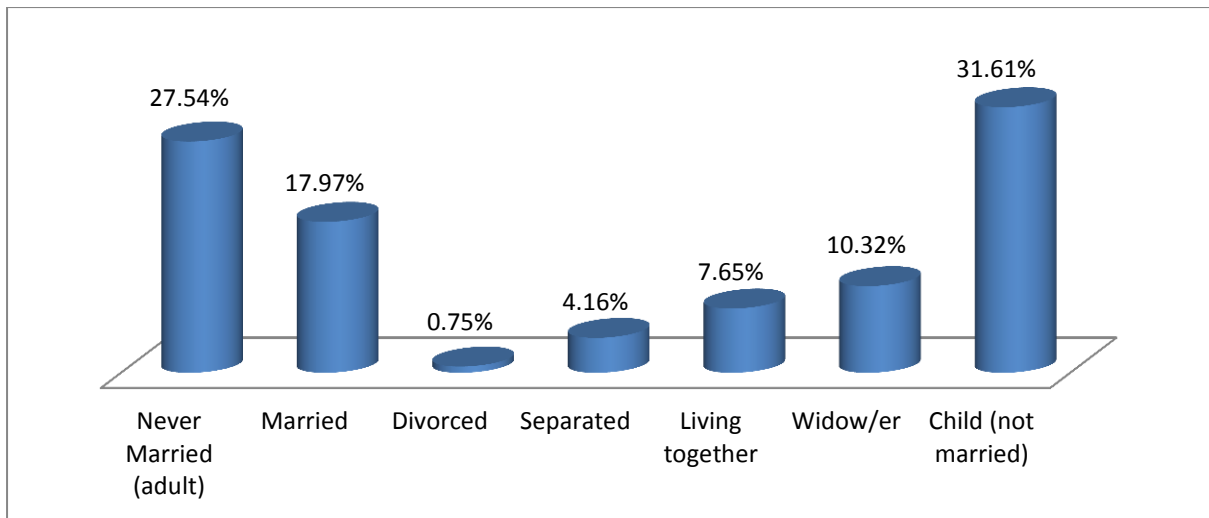


Figure 4.6: Population distribution by marital status and gender of the household head

Source: Survey data (2015)

4.5.2.7 Literacy of the population

Better educated people have a greater probability of being employed than the less educated (van der Berg, 2008:3). They are economically more productive and have higher bargaining power. Almost 30.53% of the sampled population are school-going and the remaining 69.47% are a combination of the population who are no longer at school and those without schooling.

4.5.2.7.1 Population in school

Information about the enrolment of the school-going population is summarised in Figure 4.7. The figure shows that the majority of the school-going population (25.52 %) is still in the first three year, and more than a half (51.50%) of the school-going population is in still in primary education. The enrolment for grade 12 is the second highest (13.62%), with 6.54% doing their tertiary first diploma and 3% doing their tertiary first degree. Only 0.27% of the school-going population is doing post-graduate diploma or degree.

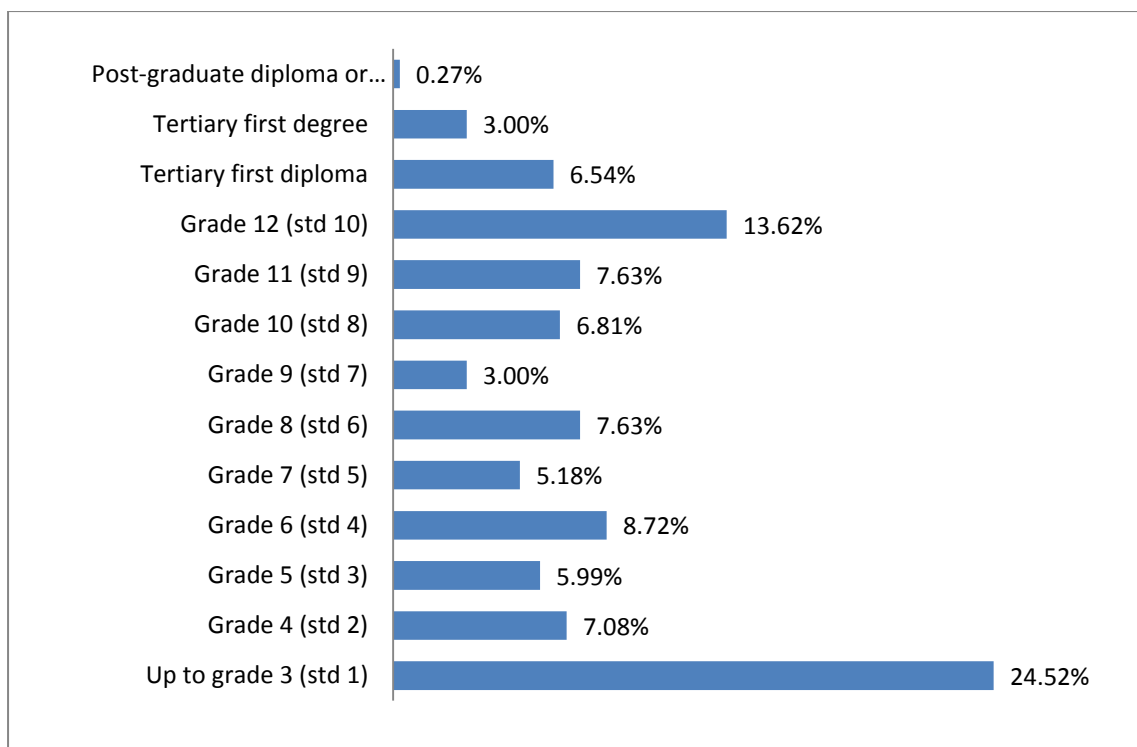


Figure 4.7: Population in school

Source: Survey data (2015)

4.5.2.7.2 Qualifications of post-school population

On the qualifications of the population the non-school-going persons in Qwaqwa, the majority (34.75%) do not have any schooling, as shown in Figure 4.8. About 16.05% have matriculation exemption, while 16.05% have not attained grade 7. Approximately 4.11% have a tertiary first degree while only 0.53% have post graduate diploma or degree. Almost a third of the non-school-going population (34.75%) do not have any schooling at all.

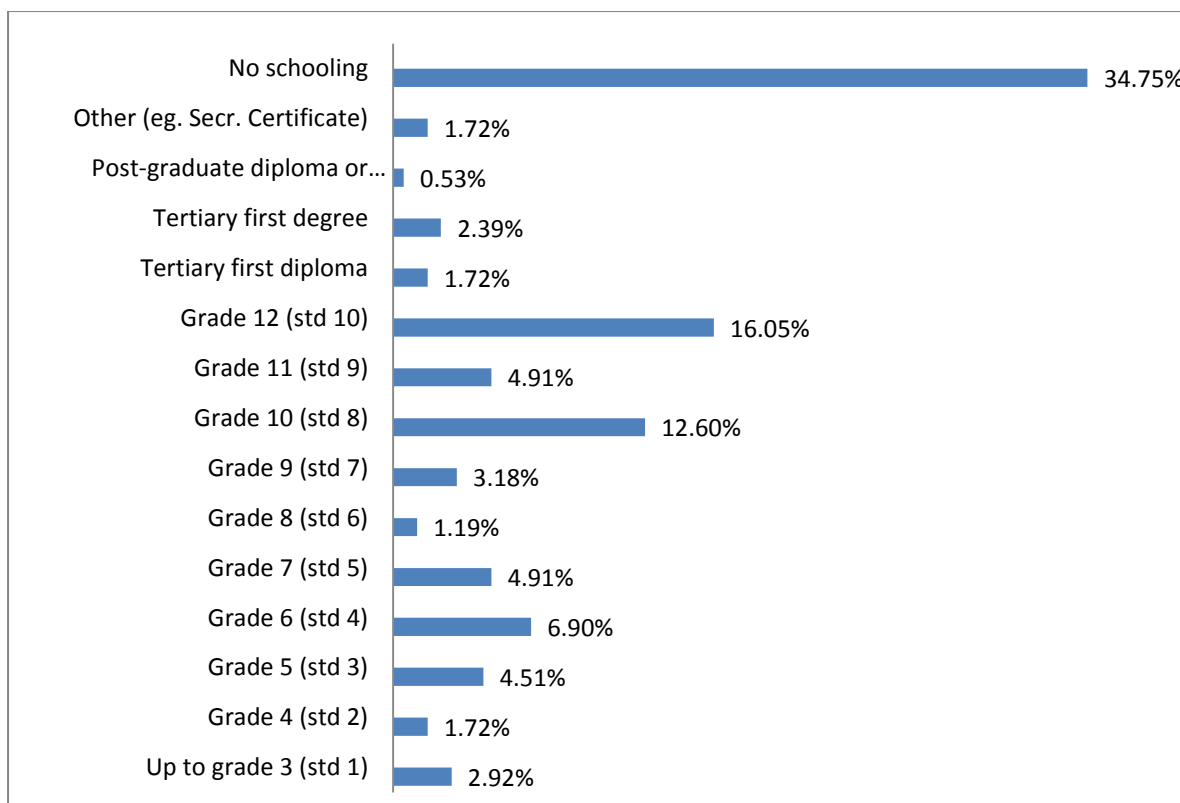


Figure 4.8: Qualifications of population out of school

Source: Survey data (2015)

4.5.3 Economic features of sampled population

The next section will show the employment status and income distribution for the sampled population. Of the sampled population, 46.09% are not economically active.

4.5.3.1 Unemployment and employment

In this study, the term ‘unemployed’ is used according to its official definition. Unemployed persons are those who are not working, but who looked for work and were available to work in the reference period (StatsSA, 2012c:48). The unemployment rate of the sample population is computed at 52.93% (Figure 4.9). Among the remaining, employed 48.10%, only 12.35% is formally employed, while the majority of 34.72% is informally employed. The highest labour absorption for the sample population is in construction (28.09%). The unemployment rate of Qwaqwa is too high when compared to the average of 25.02% nationwide (StatsSA, 2014b:v).

StatsSAs (2014b:ix) estimates that from quarter four to quarter one in 2014, the Free State province was among the five (Limpopo, Gauteng, Mpumalanga, Free State and Northern Cape) of nine provinces in which the employment rate has declined. Between quarter one in 2013 and quarter one in 2014, employment increased in all provinces, except in the Free State (StatsSA, 2014b:ix). This might be one of the reasons for the high unemployment rate in Qwaqwa which is part of Free State province. This is confirmed by a high rate of unemployment (41.8%) in the community of A-Phofung municipality (Maluti Maluti- -A-Phofung, 2014:31).

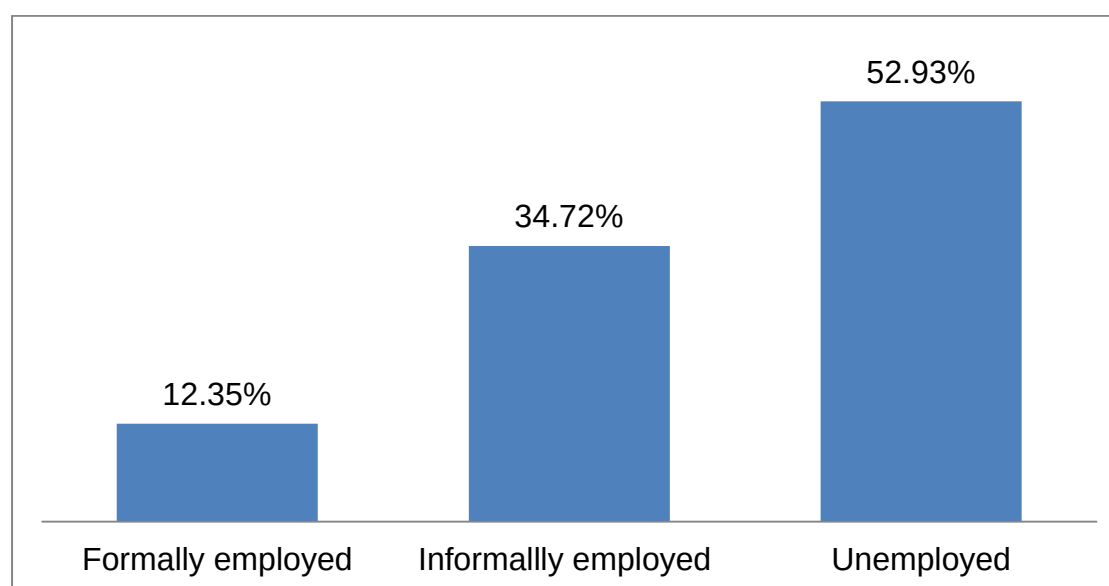


Figure 4.9: Labour force total population

Source: Survey data (2015)

In looking at the length of time the unemployed people have been without work, Figure 4.10 provides the distribution of the unemployed against the period from one to 10 years and beyond. The results show a very high and critical share of 21.63% of the unemployed population being unemployed for 10 years and over. Sixteen point eight three percent (16.83%) of the population have been unemployed for five years and in total, 56.25% have been unemployed for more than four years. sixteen point thirty five percent (16.35%) of the population has been unemployed for a period of three years at least.

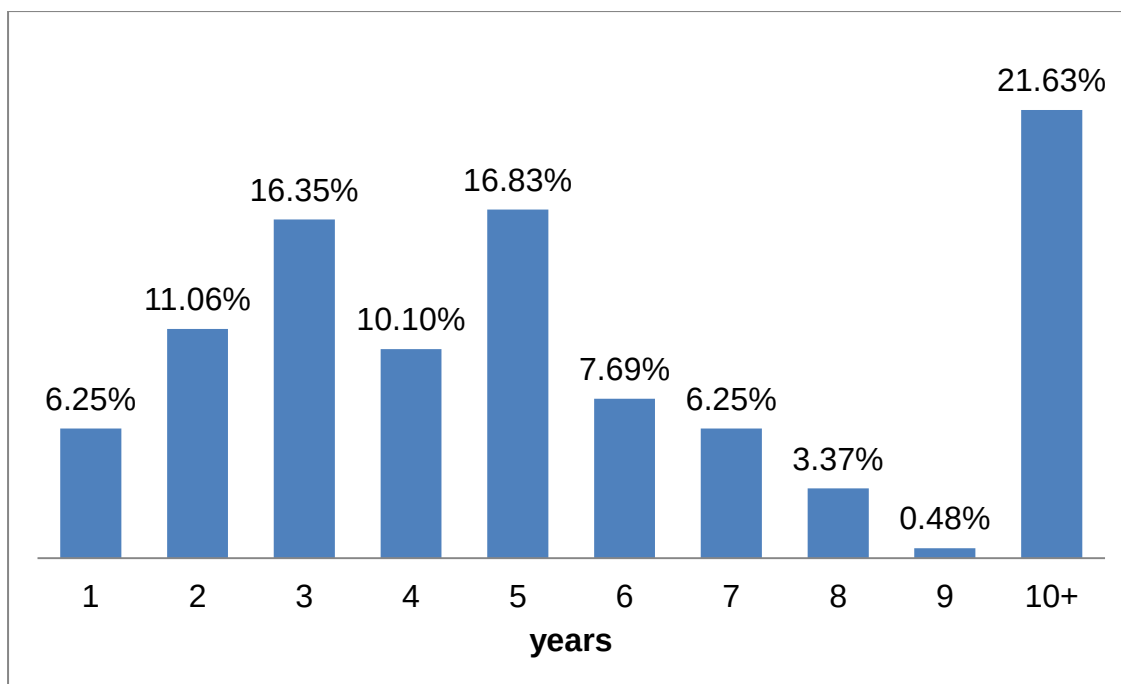


Figure 4.10: Duration of unemployment in years

Source: Survey data (2015)

Further analysis of what the unemployed are currently doing is shown in Figure 4.11. About 55% are actively looking for jobs; 32% of the unemployed population is helping with household duties. Of the unemployed population, 12% is idle, while 1% is attending training in order to improve their knowledge.



Figure 4.11: What are the unemployed doing presently?

Source: Survey data (2015)

4.5.3.2 Income

The income distribution of the sampled population shows that the average income salary/wage of the household head is R982.30 per month, with R2 325.54 being the average household income. This shows that more than half of the household income has a source of income other than household head's salary or wage. The average household head salary/wage can also be an indicator of a low average salary/wage earned by the population in the area. The distribution of household head monthly salary/wage within Qwaqwa is presented in Figure 4.12.

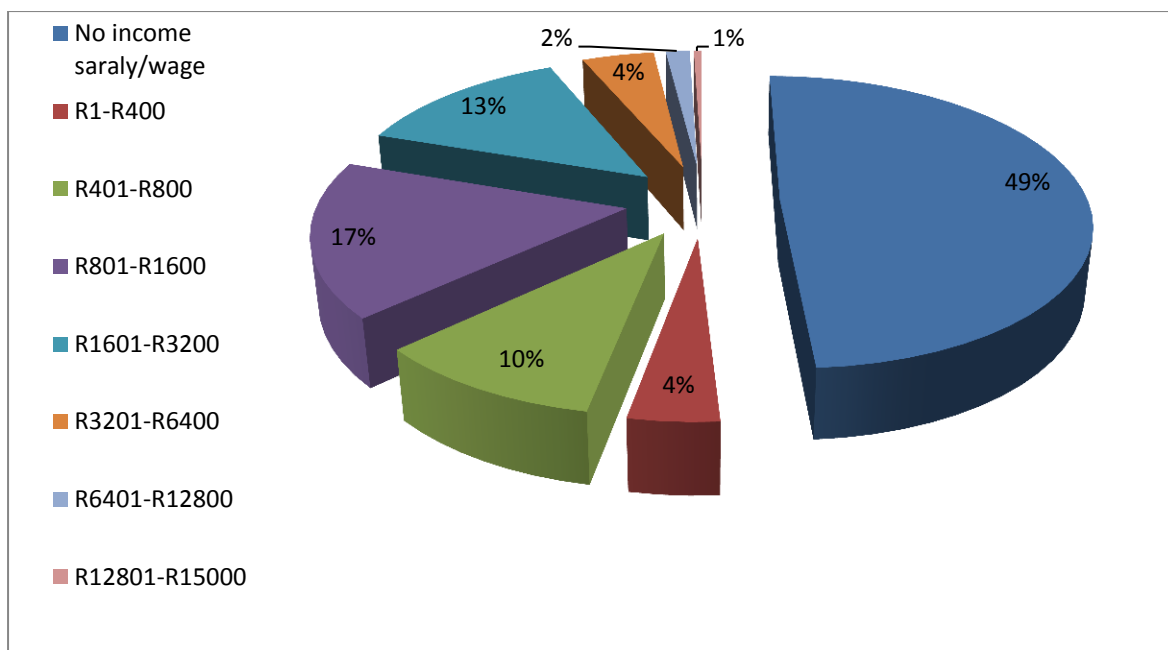


Figure 4.12: Distribution of household heads monthly income (salary/wage)

Source: Survey data (2015)

The figure shows that 49% of the household heads do not earn any income (salary/wage). About 4% earn up to R400, while 10% of the household head earn an income salary between R401 and R800 per month. Approximately 17% earn between R801 and R1600 per month, while 13% earn between R 1601 and R3 200 per month. Only 1% of household heads in Qwaqwa earn a monthly income of between R12 801 and R15 000. The high percentage of non-earning population is not only present in Qwaqwa. The Maluti-A-Phofung figures show that the majority of 40% of the population do not earn any income, while 29% earn between R1 and R400 per month (Maluti-A-Phofung, 2014:27).

A total of 70.54% of households receive government grants (old age pensions, child grants and other grants); 40.59% of households receive the old age pension, with an average amount of R1 440.50 per household; 42.82% of households receive an average amount of R562.20 from child grants; 16.09% of households receive two different types of government grants (either old age pension and child grant or other government grants and child grant) and 36.54% of households have more than one

beneficiary of government grants. This indicates that the number of beneficiaries of government grants in some households is above one, given that the highest amount of old age pension and child grants in the area are R1 370 and R330, respectively.

Based on the survey data, Figure 4.13 shows the sources of households' incomes for the population of Qwaqwa. Salaries/wages of the household head (42.24%) and other market income of the households (14.53%) contribute 56.77% to the average total household income. The old age pension contributes up to 25.14% of the average total household income, while child grants contribute 10.35%. The contribution of help from family/relatives records 5.21% of the household income, while other grants (old age pension and child grants excluded) are the last contributor at 2.52% of household income. Nationally, 57.5% of households reported salaries/wages/commission as the main source of income, followed by grants (21.5%), other sources (9.7%) and remittances (8.4%). (StatsSA, 2015:58).

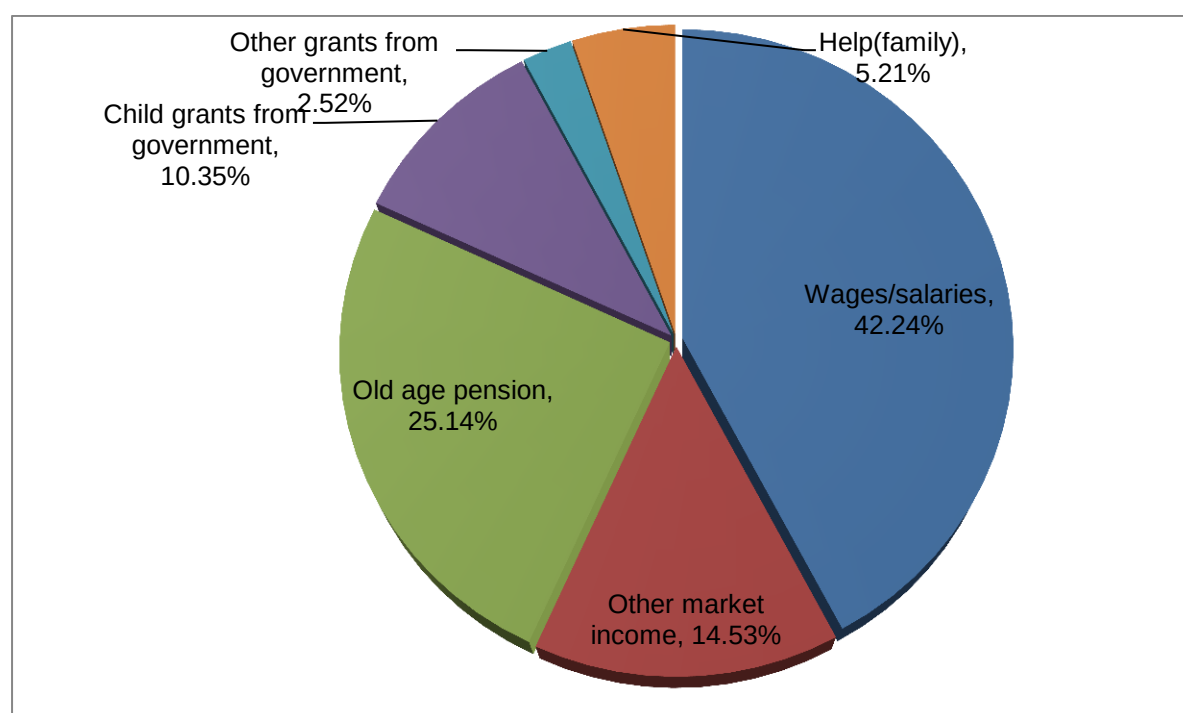


Figure 4.13: Sources of incomes for households

Source: Survey data (2015)

4.6 SUMMARY AND CONCLUSION

It is important to discuss the research methodology and design undertaken by a study so that the way in which the research problem is investigated is clear. A well-designed research design ensures the effectiveness and efficiency of the research project. A random sample of 404 households from the former homeland of Qwaqwa in Maluti-a-Phofung Local Municipality of Thabo Mofutsanyana District Municipality in the Free State province of South Africa was used in the study. Data were collected during February to March 2015, based a questionnaire which included various aspects of households' demographic and socioeconomic characteristics, as well as some aspects of well-being. In this regard, the study included household expenditure, health, education, water and sanitation, air quality, assets, housing and clothing as aspects to be used to analyse the multidimensional nature of poverty in the area. The selection of these aspects referred to the indicators and their cut-offs defined by of StatsSA, MDGs and other studies conducted in South Africa.

The average household size for Qwaqwa is calculated to be three persons per household. There is a low frequency of fathers compared to mothers and more females than males. In terms of household headship, however, there is a more or less equal spread of female-headed households and male-headed households. More than half of the population of Qwaqwa are youth below 35 years of age, while more than one tenth is 60 years old and above. Migration to Qwaqwa shows that at least a third of the sampled population has been staying in Qwaqwa for the last 15 years, while more than a third has lived in the area for the last 30 years.

The sample showed that the majority of the school-going population is still in the first three years of school, and in total; half of the school-going population is still in primary school. A very low percentage of those studying are doing postgraduate diplomas or degrees (0.27%). Almost a third of the non-school-going population (34.75%) do not have any schooling at all. This shows a very high level of illiteracy in the area.

The unemployment rate of the sample population is very high, reaching more than half the population. It was found that, among the small number of employed population, the majority is involved in informal activity and the highest labour absorption for the sample population is in construction. Almost half the sampled household heads do not earn any monthly income salary/wage but, almost three-quarters of the sampled households receive government grants (old age pensions, child grants, and other grants from government). Salaries/wages of the household head and other market income of the households contribute 56.77% to the average total household income. Old age pensions contribute 25.14% of the average total household income, while child grant contribute 10.35%.

Generally, this chapter defined the research design and methodology to be followed in the study. A data description of participants delivered a snapshot of various features of the population under study. This encompassed an overall description of socioeconomic and demographics aspects of the study. The selected dimensions to measure poverty in this study are analysed following the Alkire and Foster poverty measures. The next chapter applies the methodology described by this chapter to investigate the multidimensional analysis of poverty in a former South African homeland.

CHAPTER 5: A MULTIDIMENSIONAL ANALYSIS OF POVERTY IN QWAQWA

5.1 INTRODUCTION

One of the most well-supported goals across the globe in the past decade has been the Millennium Development Goals (MDGs), as they have provided to some extent comprehensive and specific development goals in guiding development agendas. Despite the MDG reports routinely providing progress towards the attainment of the goals and the indicators therein, there has not been an MDG index formation to provide some connectivity and correlation except the reported figures (Ashraf & Usman, 2012:2). In South Africa, and indeed in several countries in the developing world, there is a shift from the sole reliance on income or consumption unidimensional measures of poverty towards the multidimensional indicators measure which ultimately complements the income-based measures. In this regard, the measure also captures households' achievements related to non-tradable goods. These attempts are being made to eventually move beyond the conventional poverty measurement based on the unidimensional money-metric approach.

Using the multidimensional measures of poverty developed by Alkire and Foster (2011b), chapter 5 investigates the multidimensional poverty in a former South African homeland. This analysis is particularly relevant in connection to South Africa's bold adoption of the poverty-related MDGs, keeping in mind the spatial legacy of apartheid. The formulation of effective interventions to combat poverty requires a clear grasp of its manifestations in a particular area. This chapter provides such a poverty analysis in the former homeland of Qwaqwa as a whole and particularly in eight different villages in Qwaqwa. The relationship between income poverty and multidimensional poverty, multidimensional poverty and one of the demographic characteristics of households is described in this chapter. Before starting the multidimensional analysis of poverty in Qwaqwa, the chapter starts with the characteristics of poverty dimensions in Qwaqwa.

5.2 CHARACTERISTICS OF POVERTY DIMENSIONS IN QWAQWA

For a better understanding of the poverty situation in Qwaqwa, a comparative analysis is important. Multidimensional poverty comparisons between individuals and over time can be particularly difficult. The architects (Alkire & Foster) of the methodology used in this study present a flexible framework for users to utilise different dimensions, weights and cut-offs. When more than one indicator of well-being is used without a universal definition of cut-offs and weights to be used, poverty comparisons can only be made for each indicator independently. This comparison requires an estimation of a cut-off value for each indicator, in order to identify those indicators in which each individual is deprived. This process is, ethically and empirically difficult as different cut-offs can be chosen for similar dimensions by different researchers. The indicators and their cut-offs used in the current study have followed the definition of StatsSA (2014c), MDGs' definition and other studies mostly conducted in South African (Basarir, 2009; Noble *et al.*, 2006).

5.2.1 Education

The role of education in personal development has always been dubbed the engine and basis for meaningful personal progress. Higher levels of education provide a higher probability of finding employment and higher earnings follow a similar trend. Through labour markets, education impacts not only on the earnings but also on productivity and minimises the effects of poverty (Orazem *et al.*, 2007:5; Rycx *et al.*, 2015:2). This means that, in the labour market, higher productivity is likely among educated people and is compensated for by higher wages. It is also from this point of view that education indicates the ability of employees, thus the likelihood of better jobs among educated people. In other words better educated household are deemed to be less likely to be trapped in poverty. It is not surprising to see that, in middle-income countries with well-developed markets that benefits of education are likely to be better jobs and better wages. In considering the *level of education* in Qwaqwa, an analysis is shown in Figure 5.1 which compares the number of years in school, especially in the 16 years of age or older group:

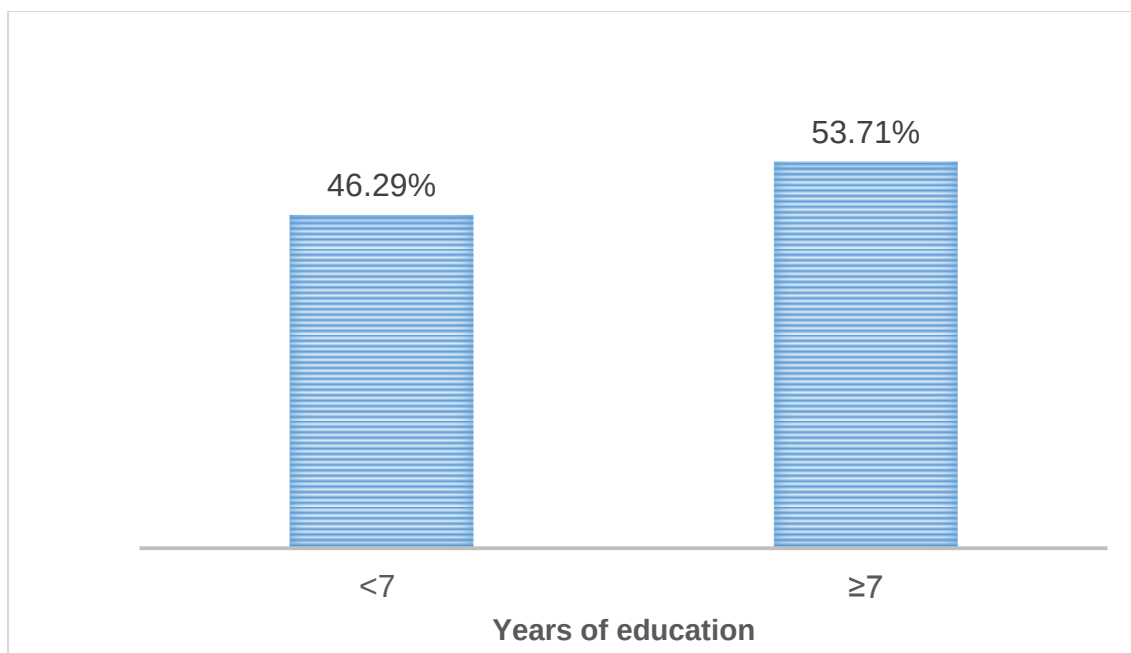


Figure 5.1: Average education level for people aged 16 years and older living in a household

Source: Survey data (2015)

As presented in Figure 5.1, a greater percentage of the 16 years of age and above population have seven years or more years in education, on the average. The figure shows that almost 54% have seven years or more of education of years as compared to the 46% of the people whose average number of education is less than seven.

Using a similar definition of educational achievement, Basarir (2009:33) found that 26.05% of households, whose members are at least 16 years old, on average, failed to complete their primary education, at least up to Grade 7/Standard 5, in the Free State province. On a national level, a slight difference was found, where 26.35% of households are deprived in educational achievement (Basarir, 2009:33). When these provincial and national averages are compared with the estimates of the former homeland of Qwaqwa, it is seen that in the latter educational achievement is the lowest. Some of the issues found in this study are that the educational achievement of a household was mainly reduced by a high level of illiteracy in the area (34.75 %). This illiteracy burden was found in almost of the people aged 50 years and above.

As indicated in Figure 4.8, the level of education achievement of the non-school-going population in Qwaqwa is still low. The effects of illiteracy cannot be overemphasised. One effect is the inability to deal with everyday life activities like reading signposts or understanding instruction on labels, or commercial transactions to avoid being cheated (Hassan, 2014:212). As the world looked forward to the rounding up of the MDGs in 2015, increasing levels of literate people cannot be prevented from achieving and consolidating the MDGs effort. Literacy skills not only provide the confidence to participate in development activities, but also provide the basis for playing expected roles in the community, with a sense of being a key member of the society who can be heard.

In adopting the definition of considering household deprivation, where at least one of the household members aged 16 years and above is not able to read and write, the study reveals that in the area many households were deprived. A similar definition of the indicator in multidimensional poverty analysis was used by Salazar *et al.* (2013:14) in Colombia. Although there is no available case for comparison in South Africa on this indicator, the level of illiteracy in the area is 34.75% of the sampled persons. In considering the households, the distribution is 53% of the households with at least one illiterate person, against 47% of households with no illiterate person. This distribution is shown in Figure 5.2.

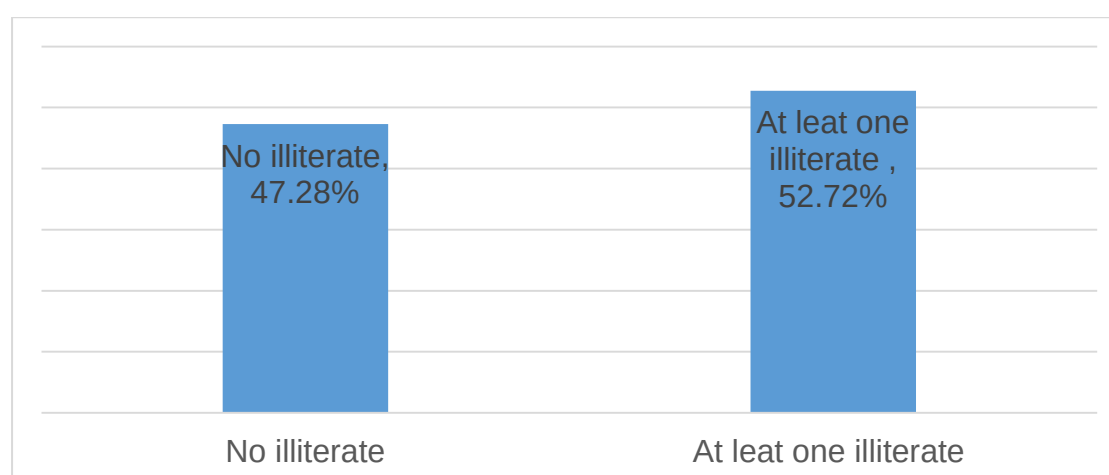


Figure 5.2: Households' illiteracy rate

Source: Survey data (2015)

The distribution analysis in Figure 5.2 shows that the illiteracy level in the former homeland of Qwaqwa is higher than the average illiteracy level in South Africa, which is 16% according to the GHS 2014 (StatsSA, 2015:26). Looking at the disturbing level of illiteracy in the former homeland it was found important to adopt this indicator in the case of South Africa, as the households with an illiterate person might be vulnerable, compared to households without any illiterate person, given the examples provided in Chapter 4, subsection 4.3.1.1.

5.2.2 Housing and clothing

“Don’t ask me what poverty is because you have met it outside my house. Look at the house and count the number of holes. Look at my utensils and the clothes that I am wearing. Look at everything and write what you see. What you see is poverty”. This is a definition provided by a poor man in Kenya, in The World Bank’s report entitled “Voices of the Poor: Can Anyone Hear Us?” (Narayan, 1999:26). Adequate clothing for different climatic conditions is essential to keep people comfortable. The average annual temperature varies between 12.5⁰ and 15⁰C in the eastern Free State, where Qwaqwa is situated (Maphalla & Salman, 2002:8). *Decent clothing* is an item that is given a high degree of importance in a South African household. In the Free State province, after food the item that income is spent second most on per month is clothes with a share of 27.9% of the monthly expenditure (Meyer, 2013:220). The composition of the access to decent clothing in the area is presented in Figure 5.3.

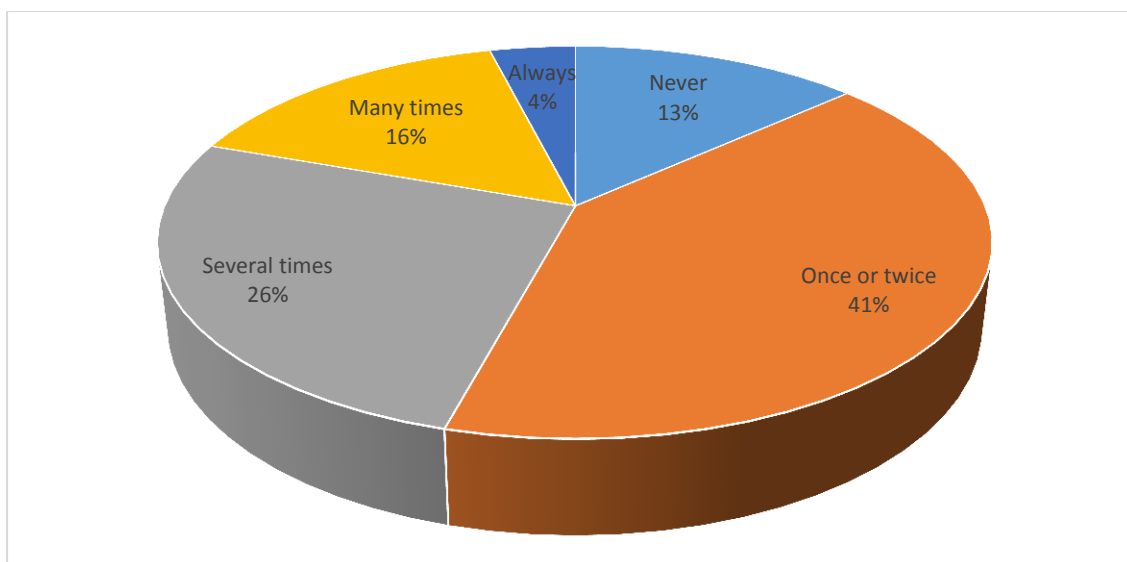


Figure 5.3: Access to decent clothing

Source: Survey data (2015)

Figure 5.3 shows that 13% indicated that, for the past 12 months before the day of the survey, they had never gone without enough decent clothing. Four percent had always experienced a shortage of decent clothing. In considering the categories of never and once or twice, the figure reveals that 54% are non-deprived, while 46% are deprived (several times, many and always categories).

In comparison, this indicator was one of the nine indicators used in measuring the LPI Sicelo community, which is located in the southern part of Gauteng province. It was found that only 24.5% of the population has never gone without enough decent clothing, while 7.1% went only once or twice without enough decent clothing, over the past 12 months. This indicates that the remaining 68.4% went several/many times/always without enough decent clothing (Meyer, 2015:11). When the proportion of the population of Sicelo who have never been without decent clothing are compared with those in the former homeland of Qwaqwa, it is seen that the Sicelo is better than Qwaqwa. When the first two categories are combined (never and once or twice) to compare the two areas, Qwaqwa will show better access to decent clothing (54.21%) compared to the Sicelo community (31.6%).

Floor of the dwelling: The floor of the dwelling is considered in the study as one of the indicators, as included in studies in other countries (Salahuddin & Zaman, 2012; Salazar *et al.*, 2013; Ashraf & Usman, 2012). In the present study, the main dwelling floor types are tiles, carpet, cement, bricks, mud and dung. The distribution is presented in Figure 5.4.

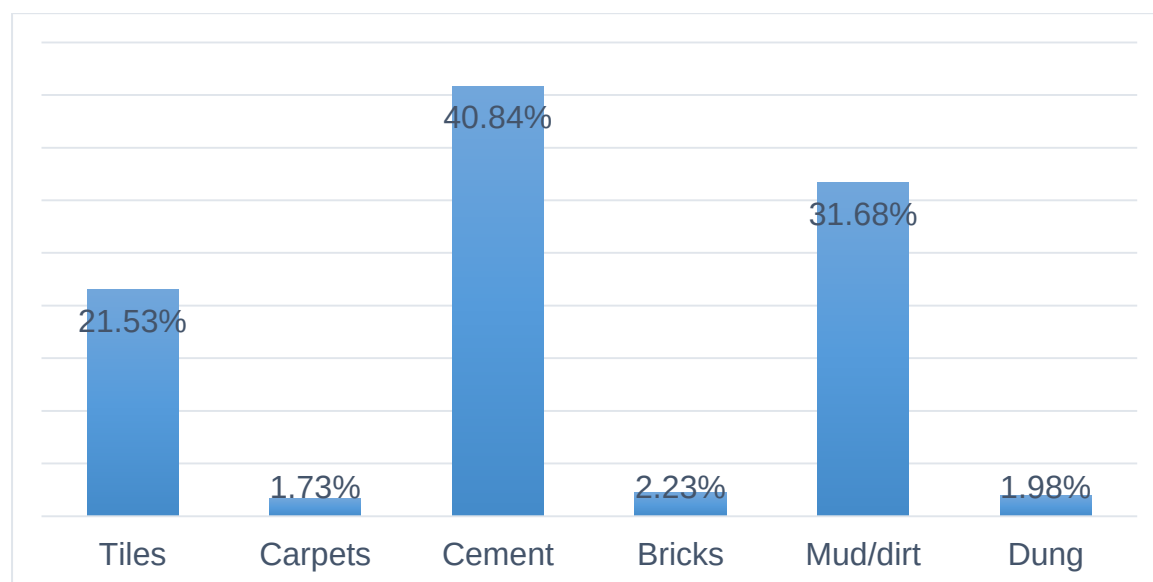


Figure 5.4: The main material used for the floor of the dwelling

Source: Survey data (2015)

As shown in Figure 5.4, a carpet floor was the least used among the materials used for the dwelling floors, while cement was the highest. The area has 2% of household floors made of dung and another 2% made of bricks. The dwelling floors made of mud/dirty and tiles were 32 and 22% respectively. In considering the households that had the dwelling floors made of tiles, carpets and cement as non-deprived, the study finds 64% of the households non-deprived compared with 36% whose floor were made of bricks, mud and dung, which were regarded as deprived. The brick floor was included among the deprived, as the households indicated had failed to use cement. The bricks floor cannot be cleaned as easily as cement or tiled floors.

Dwelling walls material: The dwell walls are also an important indicator in categorising as deprived or non-deprived. In South Africa, the walls are mainly

judged on the basis of being weak or strong (StatsSA, 2015). For example, the evaluation of RDP or state-subsidised house in Free State province during the GHS 2014 has shown that 16.2% of the houses had weak or very weak walls, while 14.5% was recorded on a national level (StatsSA, 2015:38). The percentages are high, since they do not include the conditions of other houses that are not state-subsidised. The general status when considering the dwelling house walls as an indicator may this be misrepresented. Using the strength of the dwelling houses' walls with RDP houses as a basis, the percentage of the deprived in Free State is higher than the national average. On the basis of this misrepresentation, the present study uses the materials being used for the dwelling house walls. The distribution is presented in Figure 5.5.

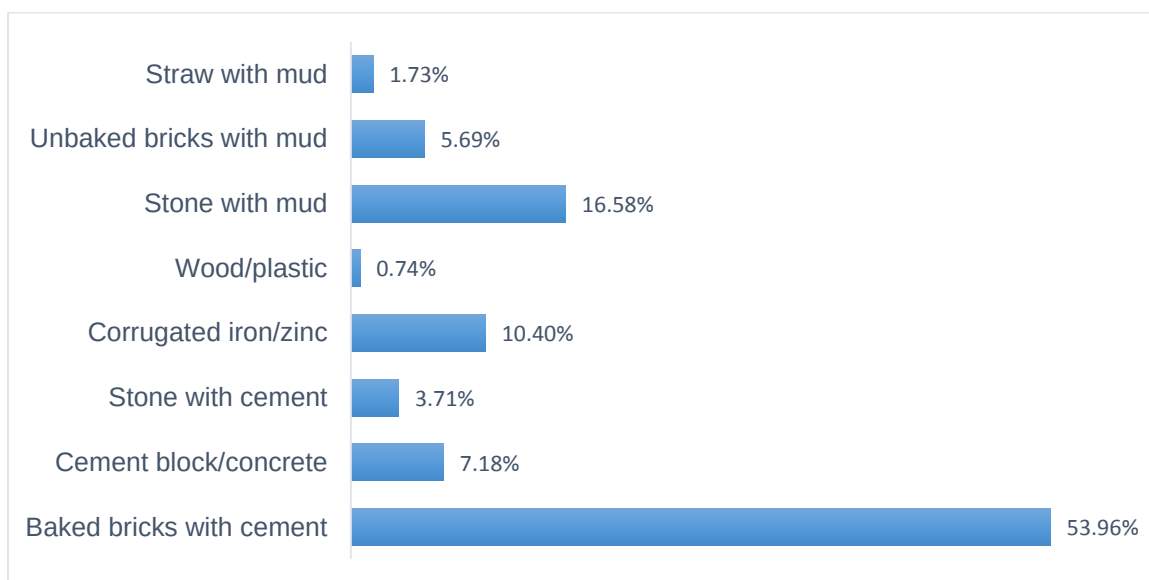


Figure 5.5: The main material used for the walls of the dwelling

Source: Survey data (2015)

The distribution shows that most of the dwelling houses' walls were made of baked bricks with cement, with 54% of the households in this category. The second highest was those made of stone with mud, which was found among 17%, followed by corrugated iron or zinc, which was reported in 10% of the houses. The distribution shows that wood and plastic was the least used, with less than 1% of the households, straw with mud in 2%, while stone with cement was used in 4%. In

critically evaluating the materials used in terms of household safety, the category of baked bricks with cement, cement blocks or concrete, as well as stone with cement, were considered to be non-deprived households. Sixty five percent of the households in the area fall in this category. The rest of the materials were considered under the deprived category. Thirty five percent of the households fall into this category. Other studies have considered corrugated iron or zinc and the wood or plastic wall materials as falling under non-deprived (Basarir, 2009). However, considering that most of such houses are dominant among shacks, mostly associated with the deprived, when considering overall housing characteristics (Klasen, 2000:40), the present study considered these types of houses under the deprived category.

Dwelling house roof materials and condition: In analysing deprivation or non-deprivation of households, the dwelling house roof and condition were considered. In considering the general state of roof quality in the Free State, and on the basis of the RDP or state-subsidised houses, the Free State province showed that 13.1% of houses have weak or very weak roofs, compared to the national level of 13.9% (StatsSA, 2015:38). As earlier noted, the comparison statistics were based on RDP or state-subsidised house, while in the current survey all houses in the area of the survey were included. The assessment is presented in Figure 5.6.

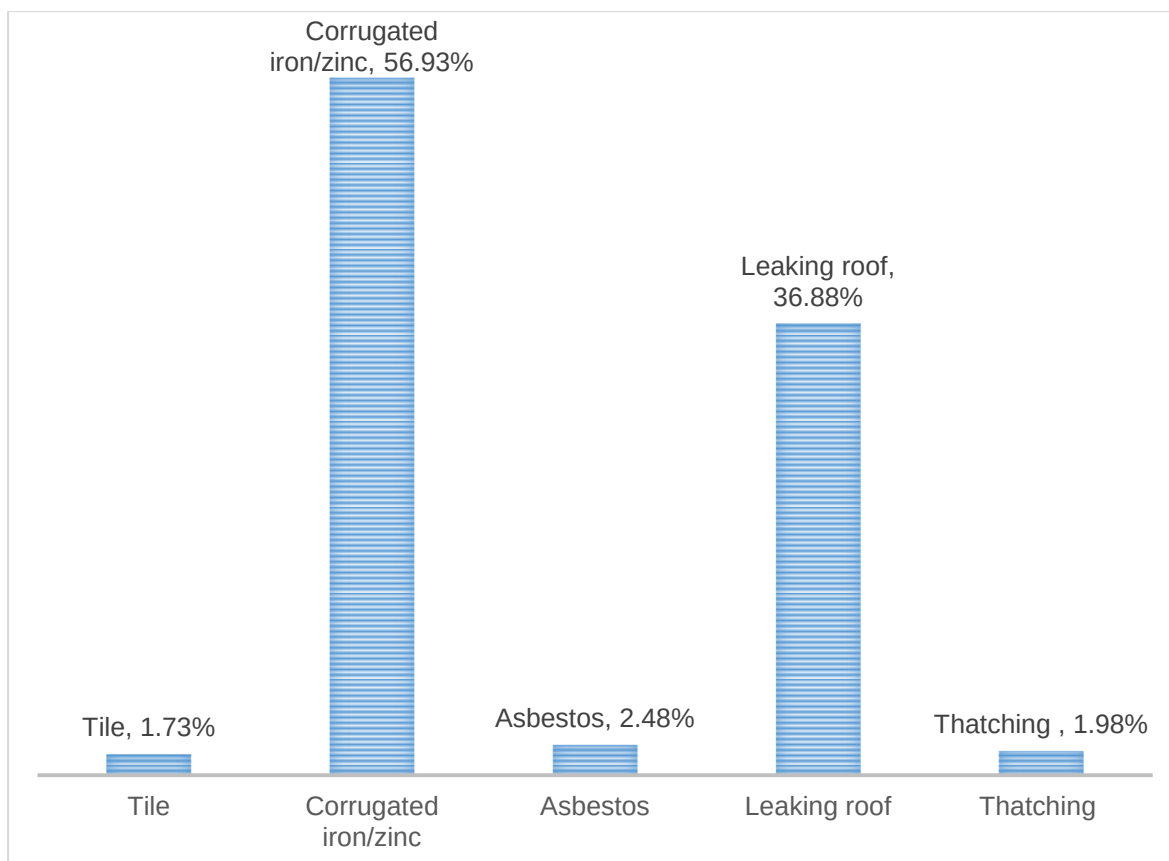


Figure 5.6: The main material used for the roof of the dwelling and condition

Source: Survey data (2015)

As presented in Figure 5.6, most of the houses in the area were roofed with corrugated iron or zinc, with 57% of the households in the category. The roofs that were made of asbestos and tiles were 2.5% and 2%, respectively. Two percent of the houses had thatched roofs. A part from the thatched roofed houses, the rest of the roofs included only those that were not leaking, as all leaking roofs were captured under the leaking roof category, which constituted 37% of the households. The study considered the leaking and the thatched roofed houses as deprived households, bringing the deprived households in the area to 39%, compares with the non-deprived of 61%.

Dwelling house rooms: One of the indicators considered in the study is the number of people per room in the household. Indicators for Monitoring the Millennium Development Goals (IMMDG) report, prepared by the United Nations Development

Group (UNDG) in 2003, provides guidance in using the housing dimension to consider the number of persons per room, or average floor per person, as one indicator (UN, 2003:97). The number of people per room which implies overcrowding is presented in Figure 5.7.

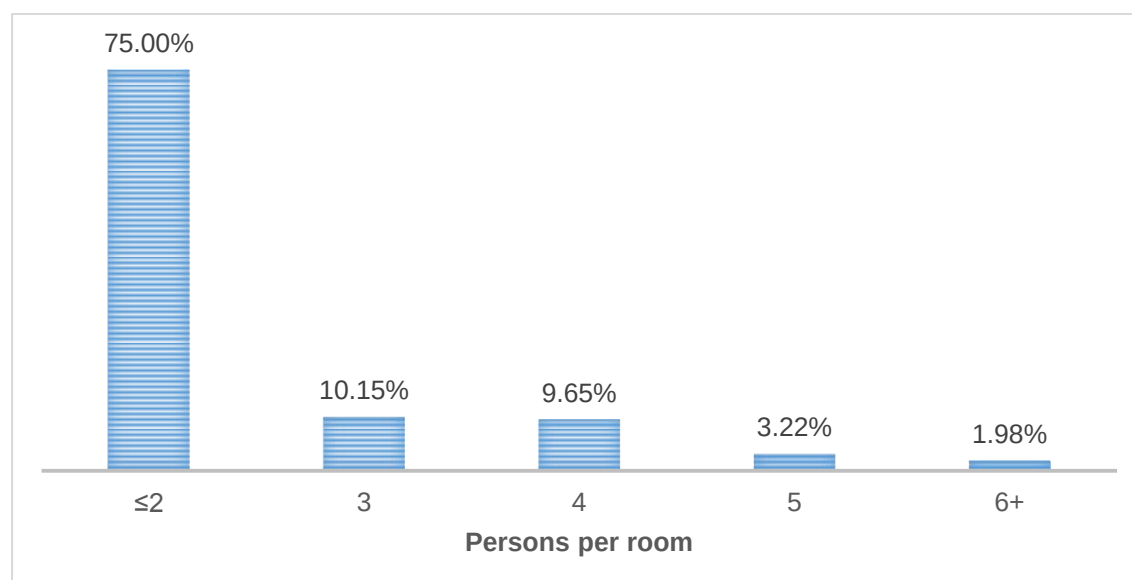


Figure 5.7: Number of people per room

Source: Survey data (2015)

Figure 5.7 shows that the most common (75%) category was in households that had two or fewer people per room. The least common (2%) were households with six or more people per room. As the number of people per room increased, the percentage of households declined, as shown by those households with three, four and five people per room, showing 10.15%, 9.65% and 3.22%, respectively. Although there is no specific standard set for identifying crowded dwellings, this study considered the report of StatsSA (2004), which fixed the number at three or more people per room. On this basis, the study shows that 75% of the households are non-deprived, compared to the 25% deprived.

5.2.3 Air quality

The following three indicators on air quality are directly related to the seventh MDG on environmental sustainability. Increasing the access to electricity is one of the key

objectives within this goal, as it not only improves the living conditions of the population, but it entails the implication of the use of alternative sources. For example, the use of electricity implies a reduction in the proportion of the population using solid fuel. This improves the quality of the air, especially when it comes to fuel for cooking and heating. The study considers fuel for lighting, cooking and heating as indicators for the dimension of air quality in the household. *The fuel for lighting* is considered first and the household composition is presented in Figure 5.8.

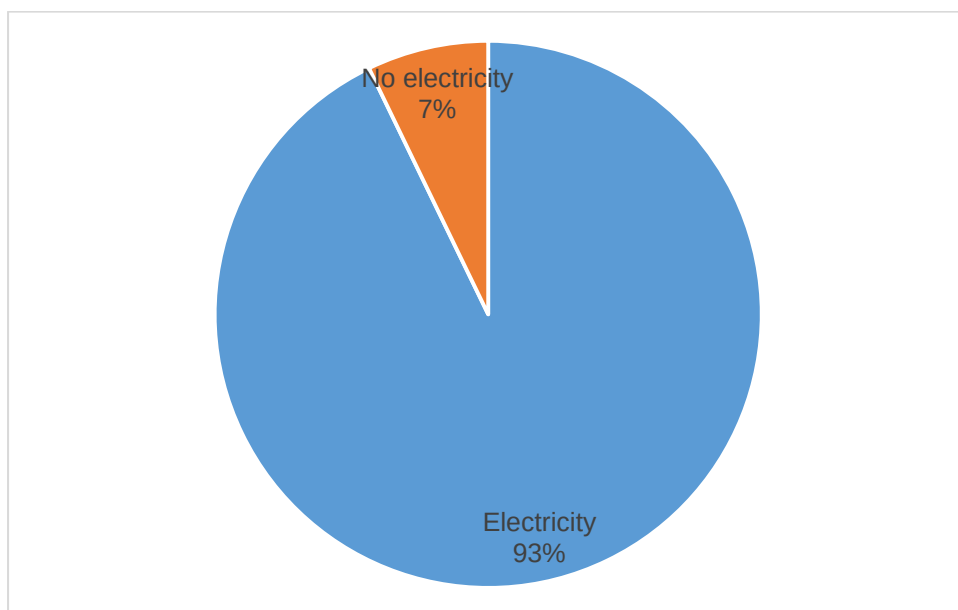


Figure 5.8: Access to electricity for lighting

Source: Survey data (2015)

Figure 5.8 indicates that the majority of the households in the area have access to fuel for lighting, with 93% having electricity. The other lighting sources such as candles and paraffin were reported from 7% of the households.

In South Africa, electricity is the main fuel for lighting. However, despite the increase in access to electricity in South Africa, there are still a large proportion of households which do not have access to electricity. The increase in access to electricity for lighting moved from 77% in 2002 to 86% in 2014 (StatsSA, 2015:39). When the national level is compared with the former homeland of Qwaqwa, it is seen that the national figure of those without electricity for lighting is higher. Based on the 2011

census, 89.6% had access to electricity for lighting in the Maluti-A-Phofung local municipality (Maluti-A-Phofung, 2014:38). Although this municipal estimate is old (2011 compared to 2014), it would be ideal to confirm that access to electricity in the Maluti-A-Phofung Local Municipality, as well as in Qwaqwa is higher than the national level. This is because, in Maluti-A-Phofung local municipality, the electrification of rural areas is prioritised (Maluti-A-Phofung, 2014:38). This is supported by the fact that the deprivation in electricity in the Free State province also has a lower proportion (7.8 %) than the national level (StatsSA, 2015:39).

The second category is the *fuel for cooking*. The household distribution on access to adequate fuel for cooking is presented in Figure 5.9.

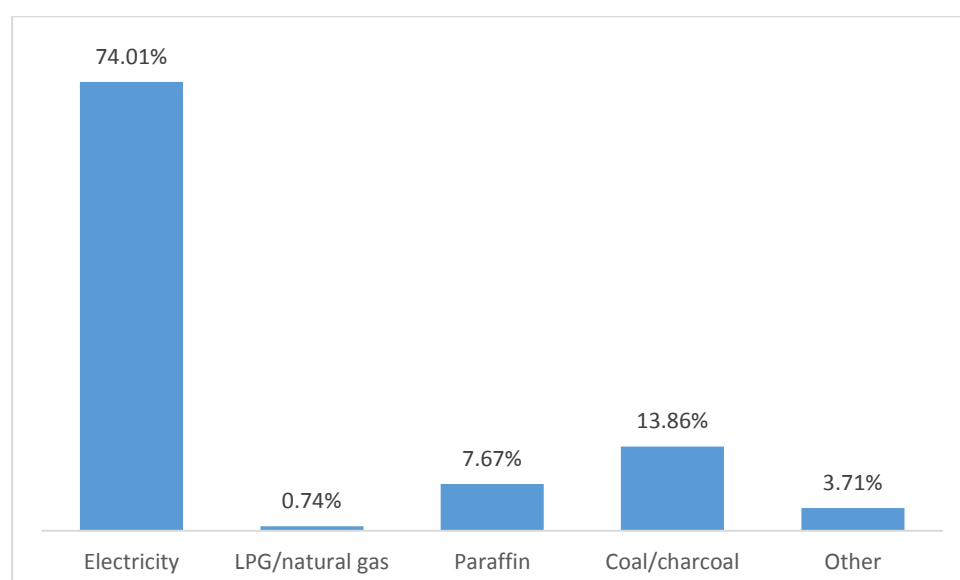


Figure 5.9: Fuel for cooking

Source: Survey data (2015)

Figure 5.9 shows that electricity is the main source of fuel for cooking, as 74% of households in the area use it for cooking. Coal or charcoal was second on the list of fuel for cooking, as 14% of the households reported. Eight percent of the households use paraffin and less than one percent use natural gas for fuel for cooking. In considering electricity and natural gas as adequate fuel for cooking representing the non-deprived, the area has 75% non-deprived households, against 25% deprived.

The estimates of StatsSA show that, in 2014, 83% used electricity and natural gas as fuel for cooking and were thus non-deprived, while 17% used paraffin, coal, wood and others fuels (StatsSA, 2015:40). The situation is the opposite in terms of fuel for cooking in the former homeland of Qwaqwa, which has a higher deprivation rate than the national rate. In considering access to electricity as fuel for lighting, the area has a better percentage than the national level.

The third and last category under air quality is the access to ***fuel for heating*** and the household distribution is presented in Figure 5.10.

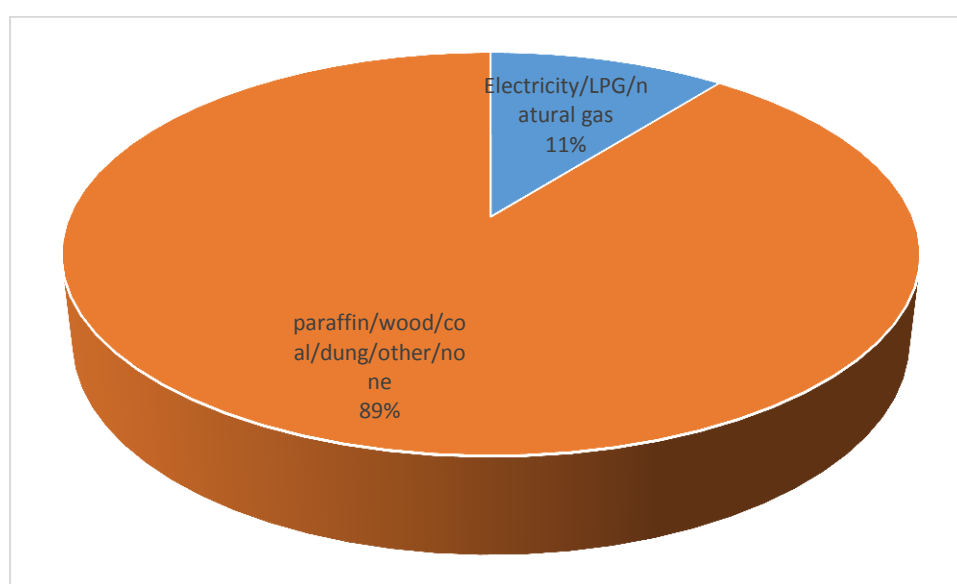


Figure 5.10: Fuel for heating

Source: Survey data (2015)

The use of electricity and natural gas in the area is shown to be lower than the alternative types of fuel, as shown in Figure 5.10. Eleven percent of households were using electricity and natural gas, compared with the 89% using other types of fuel. In Qwaqwa, 89% of the households are deprived and 11% are not. The GHS 2014 found that 36.9% of the Free State population use electricity or gas as fuel for heating, while the remaining 63.1% use paraffin/wood/coal/dung/other/none as fuel for heating. Nationally, only 38.2% use electricity from mains or generators, or gas, while 61.8% use other kinds of fuel for heating (StatsSA, 2015:146). The percentage

of deprivation in fuel for heating in Qwaqwa is much higher than the national and provincial estimates.

In the South African MPI of 2014, the fuel for heating was found to be the second highest contributor (38%) to the overall deprivation, after deprivation in sanitation (40%) (StatsSA, 2014c:7). In the basic analysis of the current study, it was found to be the first, as presented in Figure 5.20. This indicates that the deprivation in fuel for heating is not only high in Qwaqwa, but also in the whole country.

The possible explanation for the higher use of other means of fuel for heating might be that Qwaqwa is a low-income area in which most of the households are granted free electricity and they pay if they use units that are worth more than R100. Electricity appears to be used mainly for lighting and cooking, in order to keep the costs low. In general, the socioeconomic situation of the area appears to be poor and economic activity is low (Department of Water Affairs, 2011:9).

5.2.4 Water and sanitation

The water and sanitation indicator provides the status of deprivation on the basis of the household access to an adequate and safe water source, as well as sanitation. The rubbish removal was the one of indicator in this dimension, but it was later dropped, as every household was found to be deprived. The household distribution of *the water source* is presented in Figure 5.11.

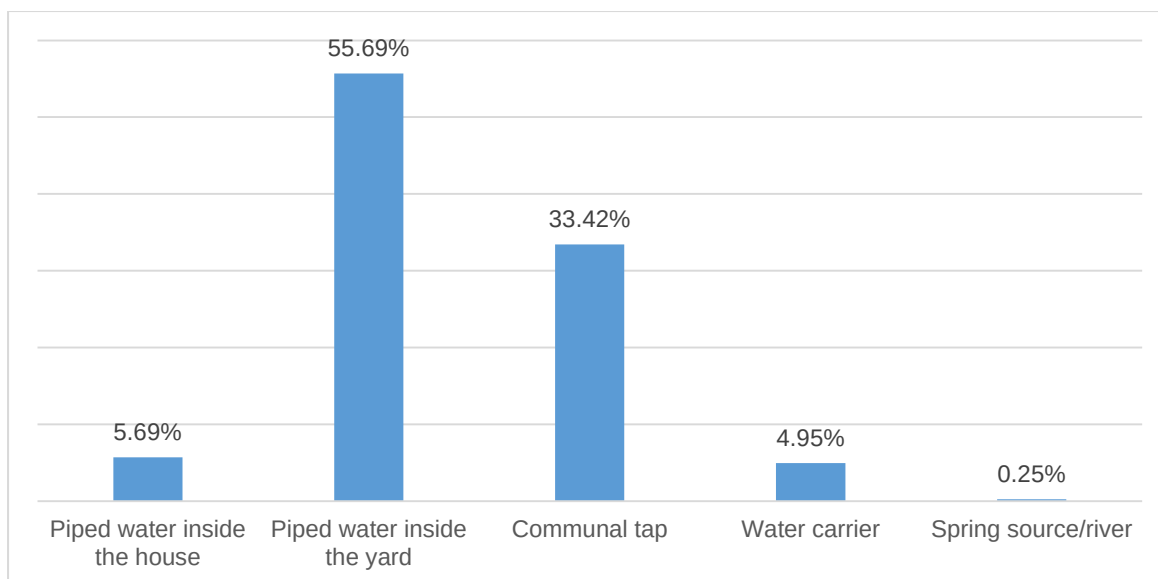


Figure 5.11: Water source

Source: Survey data (2015)

Figure 5.11 shows that access to piped water was high, (62% of the households in the area), with 56% having water inside the yard and 6% inside the house. The communal tap constituted 33% of the households, while 5% and less than one percent was for water carrier and spring or river source, respectively. In considering the tap water inside the house or yard as representing the non-deprived, the figure shows that in the area 62% are non-deprived and 38% are deprived.

Nationally, an estimated 46.3% of households had access to piped water in their dwellings in 2014 in South Africa. A further 27% accessed water on site, while 14% relied on communal taps and 2.7% relied on neighbours' taps (StatsSA, 2015:42-43). StatsSA (2015:42-43) reveals that households' access to water improved, while 4.1% of households still had to fetch water from rivers, streams, stagnant water pools, dams, wells and springs, in 2014. As fewer than 5.69% of households in Qwaqwa have water inside their dwelling, this is critically low, compared with 46.3% on a national level. Although the margin is higher than what was defined by StatsSA (2014c:6) as an adequate source of water, the comparison between Qwaqwa and the whole of South Africa shows that the margin is decreased (61.39% and 73.3%,

respectively). Generally, access to an adequate water source in the former homeland of Qwaqwa is still lower than the national level.

Type of sanitation: one of the key links in the disease cycle with poverty, among the poorest people, who would otherwise help in social economic development, is the inadequacy of sanitation facilities (Scott *et al.*, 2003:iii). In classifying the deprived, the current study followed Noble *et al.* (2006:23) and StatsSA (2015:48), who considered flush toilets connected to a public sewerage system or a septic tank, and a pit toilet with a ventilation pipe as adequate type of sanitation. Ventilated Improvement Pit toilets (VIP), if constructed to agreed standards and maintained properly, provide an appropriate and adequate basic level of sanitation service. The sanitation types are presented in Figure 5.12.

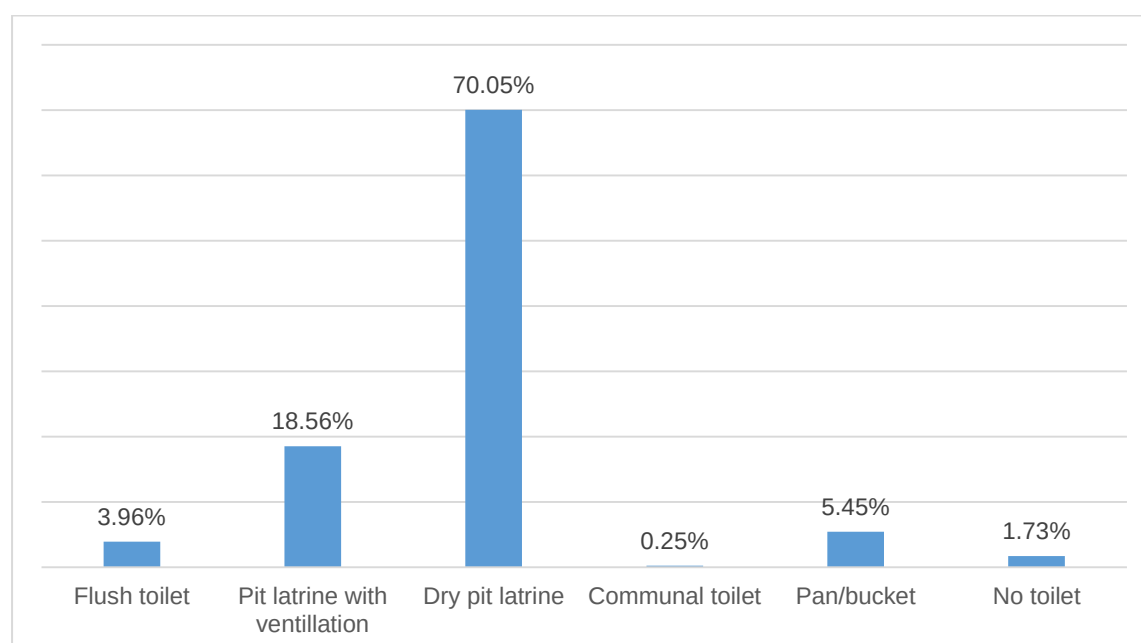


Figure 5.12: Sanitation type

Source: Survey data (2015)

The figure shows that only 4% of households in Qwaqwa have access to a flush toilet, while 19% has access to a pit latrine with ventilation. The majority population has access to dry pit latrine and almost 2% have no toilets. The area thus has a non-

deprived population at 23% (flush toilet and pit latrine with ventilation) and a deprived population of 77%.

In its report, The South African MPI, StatsSA considers only flush toilets as an adequate type sanitation and 40% of South African were found not to have access to that kind of toilet in 2011 (StatsSA, 2014c:6). Using the same census of 2011, approximately 32% of households in Maluti-A-Phofung Local Municipality have access to flush toilets. This indicates that on a national level, the Maluti-A-Phofung Local Municipality is substantially behind. In comparing further, Qwaqwa has far less than that of the whole municipality.

In other words, using the lenient definition of adequate type of sanitation (flush toilet and pit latrine with ventilation), the deprivation of adequate type of sanitation is still high in Qwaqwa (77%), compared to the national level (19.5%). Despite the definition considered, this does not apply to shared facilities. Households that share toilet facilities, regardless of its modality, experience some issues including poor lighting, inadequate hygiene, physical safety threatened, and toilet pit or chamber full, no water to flush the toilet or wash hands, inadequate enclosure, long waiting times, poor maintenance and toilet blocked up, among other factors.

Rubbish removal: The proper disposal of household waste and refuse is important to maintain environmental hygiene of the households' neighbourhoods. According to the GHS 2014, refuse was removed at least once a week in about 64% of South African households. During the current survey there is no household that has reported receiving any rubbish removal service, not even on a monthly basis. The weekly rubbish removal in the rural Free State was recorded to be zero percent, while rural South Africa records up to 6.6% (2015:51). StatsSA (2015:51) report that households in urban areas are much more likely to receive some rubbish removal service than those in rural areas. This implies that rural households are much more likely to rely on their own rubbish dumps. With such underpinnings, all households in Qwaqwa and rural Free State would therefore be deemed deprived. However, the indicator was not included in the multidimensional analysis of poverty, to avoid obvious bias.

5.2.5 Assets

Access to telephone, TV or radio and other assets was each analysed individually, following the South African Index of Multiple Deprivation 2001 in Noble et al. (2010). The study discusses the categories of communication, information and ownership of other assets. The role of telephones, and in particular mobile phones, is becoming more of a vital tool in bridging access for various services, including health. In Malawi, for example, text messages are exchanged every day between health providers and those affected by HIV and AIDS on medicine schedules. Another example is where citizens are able to report violence via text messages in Kenya, Nigeria and Mozambique, to a centralised server, accessible from anywhere in the world (Aker & Mbiti, 2010:22). In his speech during the Connect Africa Summit on 29 October 2007, Paul Kagame, president of Rwanda, said: “In 10 short years, what was once an object of luxury and privilege, the mobile phone, has become a basic necessity in Africa” (Aker & Mbiti, 2012:3). Mobile phones have become synonymous with communication, as shown in Figure 5.13.

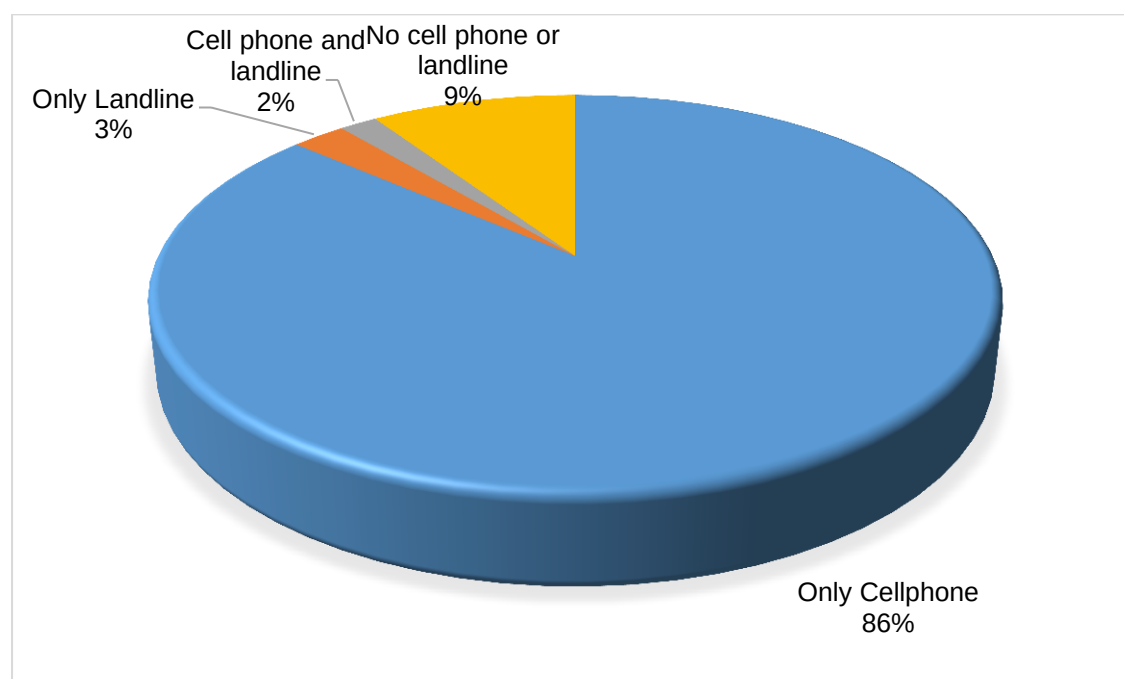


Figure 5.13: Access to means of communication

Source: Survey data (2015)

There is indeed a wider use of cell phones in the area, as only 12% do not have access to cell phone communication. The use of a landline is minimal, as only 3% reported, while those that have both cell phone and landline telephone were 2% of the population. The figure shows that 9% of the population do not have access to cell phone or landline telephone.

In the Free State, 4.9% of the population do not have either cell or landline telephone (StatsSA, 2015:52). In the same province, 0.3% of the population have only land line telephone, 87.6% have only cellphones and the remaining 7.2% have access to both cell and landline telephones. Nationally, only 4.1% of households did not have access to landlines or cellphones, while 0.2% of households use only landlines, 83.1% have cellphones only, while the remaining 12.6% have both cell and landline telephones. It is seen that households without any kind of media communication is proportionally higher in the former homeland of Qwaqwa (9%), in relation to provincial (5%) or national level (4%). The use of the mass media is an important prerequisite for communication and an agent of change towards meaningful social development, as knowledge gained through this means not only challenges any adverse attitudes, but also re-aligns them (Mohammed, 2013:2). In addressing poverty, the needy may not only require economic resources but much more, their empowerment through the availability of information to necessitate their meaningful participation in their social and political life (Coronel, 2011:6). This implies that, for any meaningful achievement of social development goals, there is a need to create deliberate opportunities to effectively disseminate information to society. The access to information has thus been classified as from *TV or radio*, as shown in Figure 5.14.

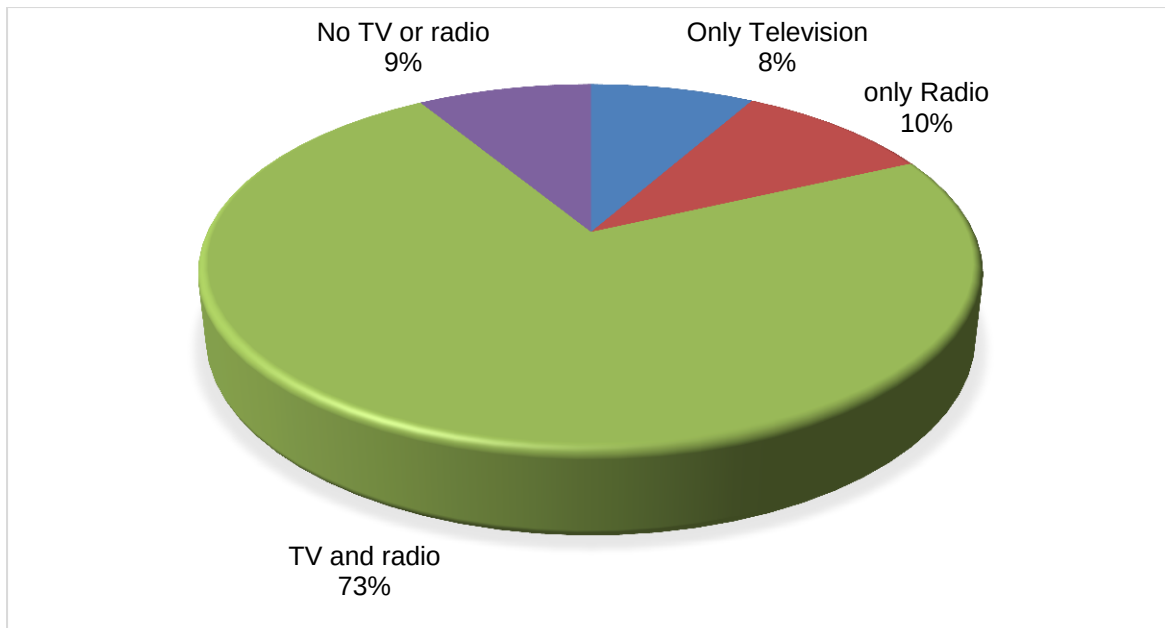


Figure 5.14: Access to media and entertainment

Source: Survey data (2015)

Figure 5.14 shows that as many as 91% of the population has access to information through the TV or radio. In the area, 73% has access to both radio and TV, while 10% has access to radio. Although the ownership of a radio was not recorded in GHS 2014, in terms of television set ownership, more than eight-tenths of households owned television sets (81.5%) in South Africa, which is very similar to Qwaqwa (81%) (StatsSA, 2015:56).

The last category on the asset analysis looks at the ownership of assets among households, including livestock. Household assets influence the extent to which households can diversify their livelihoods. **Asset** poverty is an economic and social condition that is widespread. This is shown in Figure 5.15.

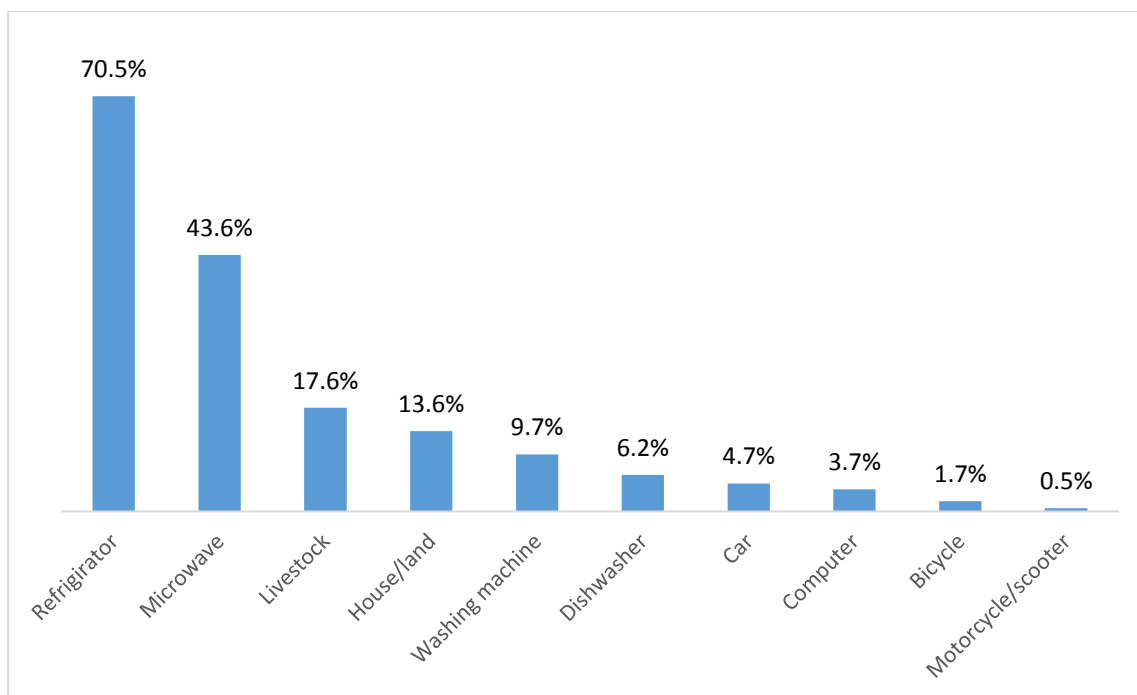


Figure 5.15: Percentage distribution of households by selected assets owned

Source: Survey data (2015)

Figure 5.15 shows that a large percentage of the sampled population own refrigerators (70.54%). The ownership of washing machines was reported at 10%, 4% owned a computer and cars were owned by 5%. In comparison with the national level, the asset ownership is still lower, because, in South Africa 73.4% own refrigerators, 34.2% own washing machines, 30% own at least one vehicle and about one-fifth (20.9%) own one or more computers (StatsSA, 2015:56).

In further analysing the distribution of asset ownership, there were some households that were reported as not owning any of the specified assets. Distribution details are provided in Figure 5.16.

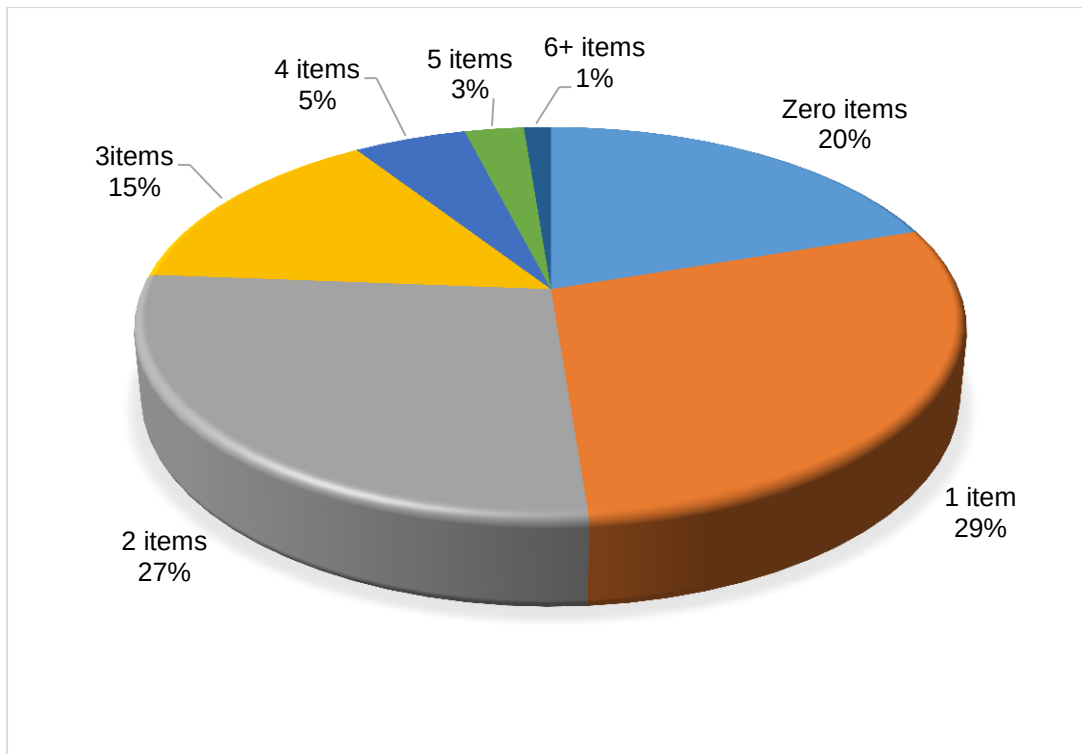


Figure 5.16: Distribution of ownership of assets items

Source: Survey data (2015)

Most households owned one or two of the specified items, while 20% of the population had none of the specified assets. In terms of asset ownership as a deprivation dimension, households in Qwaqwa are more deprived than the South African national average.

5.2.6 Health

The health dimension in the study includes time spent accessing the health facility, as well as the food security. The first indicator is the access to a *health facility*, as measured in the time taken to get to the nearest health facility, with the usual means of transport available to the household. There is a significant negative correlation between visiting rates and travelling distance, indicating that the visiting rate decreases when travelling distance increases (Magnusson, 1980:207). The majority of households in the area reported to be accessing the health facility in more than 30 minutes, as presented in Figure 5.17.

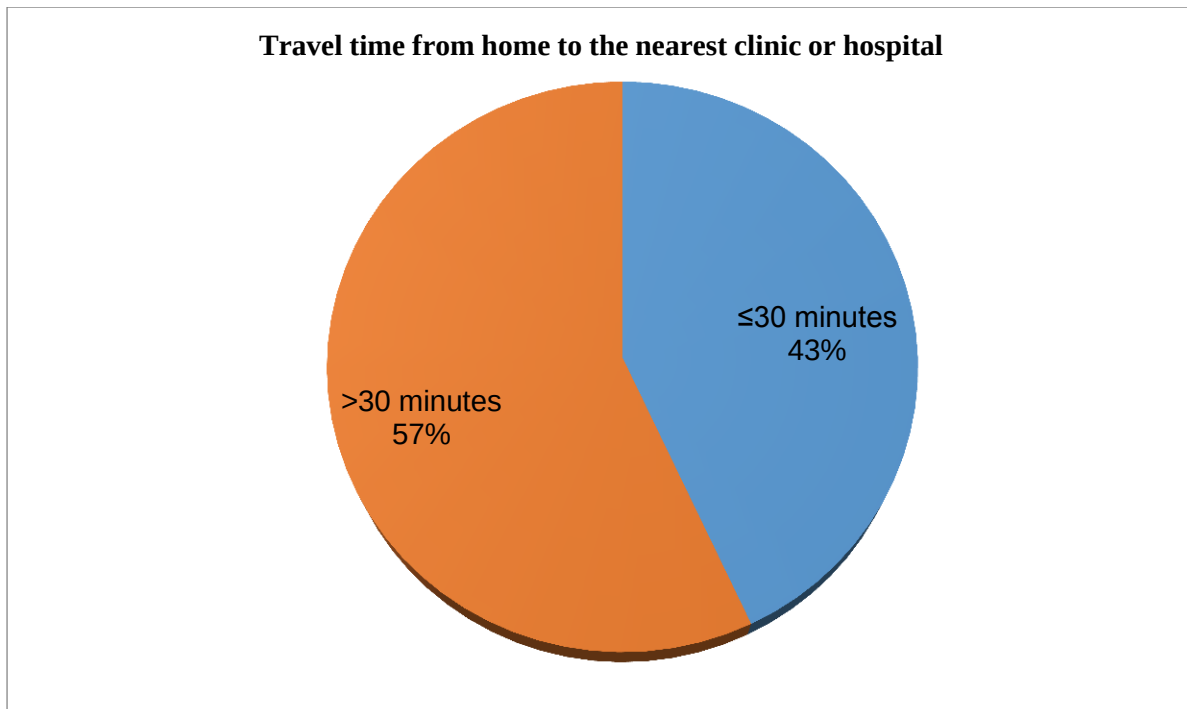


Figure 5.17: Proximity of health facilities

Source: Survey data (2015)

The results of the present study show that about 57% of the households in the area spent more than 30 minutes to access their nearest facility and are thus deprived. The area still has a higher percentage of households with no access to a health facility within 30 minutes, even when compared with the national level from the national statistics of 2008. One such study, that of Basasrir (2008:3), which was referred to in the methodology found that 30.51% of the South African population do not have access within 30 minutes to the nearest clinic or hospital using their usual means of transport.

The related indicator under the dimension is the food security component. Under this, the Household Food Insecurity Access Prevalence (HFIAP) indicator is used to analyse the household food insecurity prevalence (Coates *et al.*, 2007:19). The HFIAP indicator categorises, in general, the households into four main levels of food security status, namely food secure, mildly, moderately and severely food insecure.

These categories depend on the frequencies of food scarcity or sufficiency occurrence and the study provided nine frequency-of-the-occurrence questions.

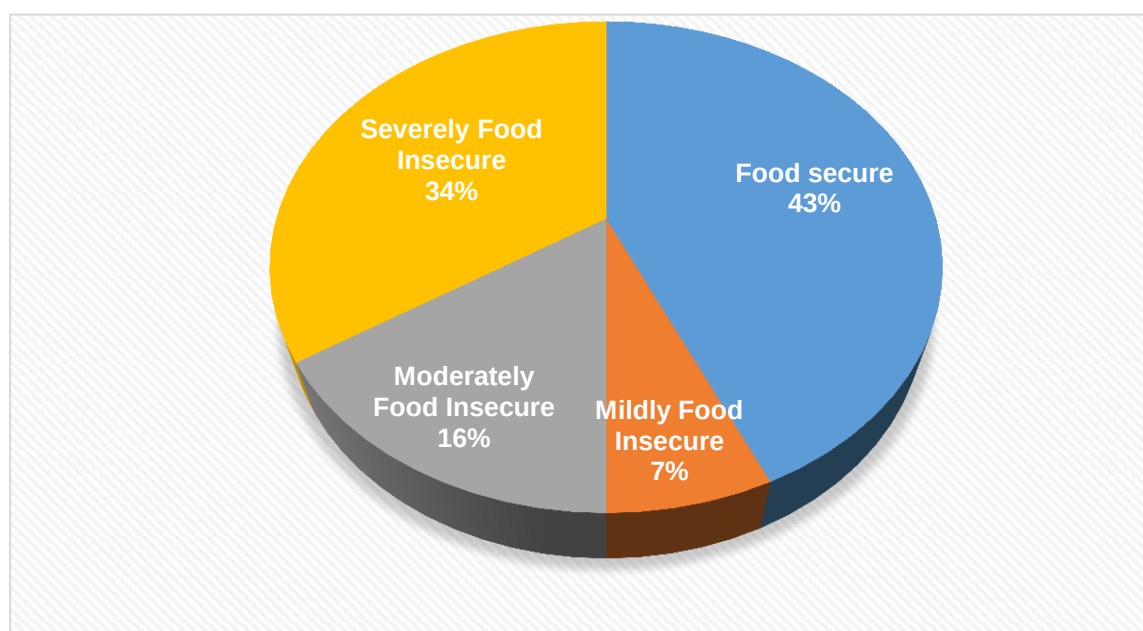


Figure 5.18: Food security

Source: Survey data (2015)

The results show that 43% of the households were food secure, while 7%, 16% and 34% were mildly, moderately and severely food secure, respectively. This is illustrated in Figure 5.18. In this study, however, the three categories of food insecure are simply combined into food insecure. Therefore, only two categories (food secure and food insecure) are considered. Food secure households did not worry about food access; they rarely experienced anxiety about not having enough food. These are households that were able to have a full meal three times in a day, without food running out, in the past 30 days (Coates *et al.*, 2007:19). South African figures indicate that only 22.5% of households had limited access to food in 2014 (StatsSA, 2015:59), while as many as 57% of the sampled population showed deprived, as they have demonstrated different degrees of vulnerability to access food.

5.2.7 Income

The income indicator is used to categorise the income poor and income non-poor. Basing on these categories, income poverty is shown in Figure 5.19.

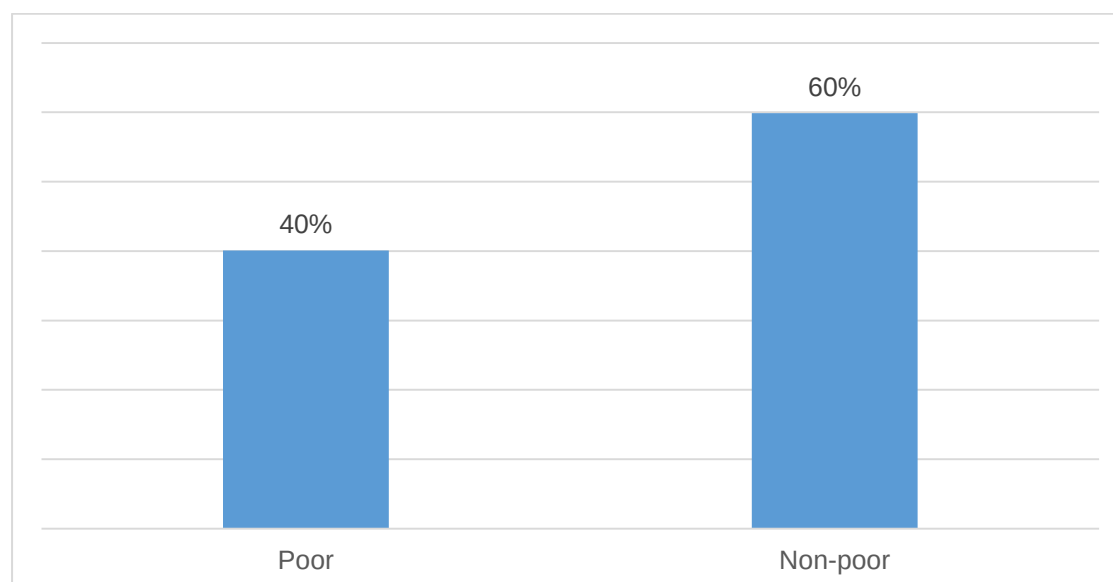


Figure 5.19: Income poverty status

Source: Survey data (2015)

The figure shows that in the area 40% of the households are income poor and this is above the national level of 32.9% of income poor in 2011 (StatsSA, 2014a:40). In general terms, the former homeland is more deprived than the whole of South Africa, in almost all dimensions, by a wide margin. This provides a strong reason to concentrate deprivation-reducing efforts in the area.

5.2.8 Aggregate deprivation by indicator

In analysing the dimensional aggregate deprivation, Figure 5.20 depicts the approximate headcount in each indicator of seven dimensions, ordered from highest to lowest. It also presents the contribution to the overall deprivation in each of them. From the figure it can be seen that 40% of the population do not earn enough income to afford the basic needs basket, according to the definition of income poverty. However, some incidences of deprivation are higher (e.g. sanitation and

food security) than income poverty. In particular, 89% of the population in Qwaqwa do not have adequate means of heating their houses during winter (using paraffin/wood/coal/dung/other/none) and 77% do not have access to adequate types of sanitation (no flush toilet or pit latrine with ventilation). About 43% of the households do not have access (within 30 minutes by the usual means of transport) to the nearest clinic or hospital and 57% of the households are food insecure as defined by HFIAS.

Approximately 53% of households in Qwaqwa have at least one member aged 16 or older who does not know how to read or write, while 46% of the members of households who are at least 16 years and older have, on average, failed to complete their primary school education at least up to Grade 7/standard 5. About 46% of households reported that they have gone several/many times or always without enough decent clothing over the twelve-month period prior to the survey. The lack of piped water in dwellings or on stands records up to 39% of households in Qwaqwa, while defectiveness of materials used for roofing the dwelling records up to 39%, 36% for floors material and 35% for the walls material of the dwelling. The assets deprivation records up to 20% of the population in the area while inadequacy of fuel for cooking contributes up to 25%. Almost 25% live in a household with three or more people per room, 9% of households do not own cell or landline telephones as a means of communication and 9% do not own at least a TV or a radio as a means of access to information and entertainment. Only 7% do not have access to electricity, primarily used as means of lighting. These figures provide a first basis for priorities within the selected dimensions in terms of policy design.

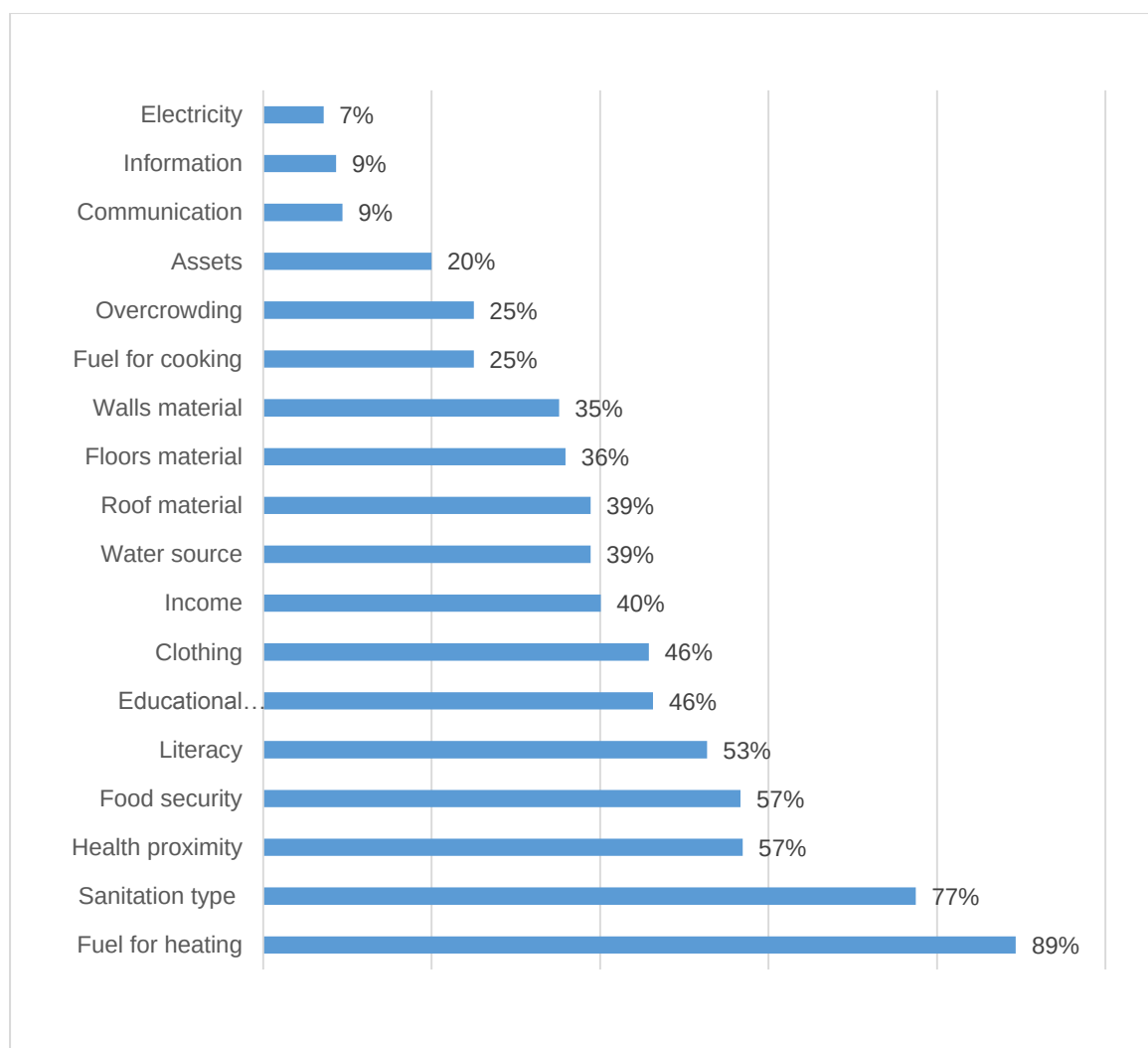


Figure 5.20: Aggregate deprivation by indicator

Source: Survey data (2015)

Figure 5.21 presents the percentage of households facing an exact number of deprivations. There was no household that was found to have no deprivation at all. All households are deprived in one or more dimensions. Figure 5.21 also reveals that more than 60% of households are deprived in six or more dimensions.

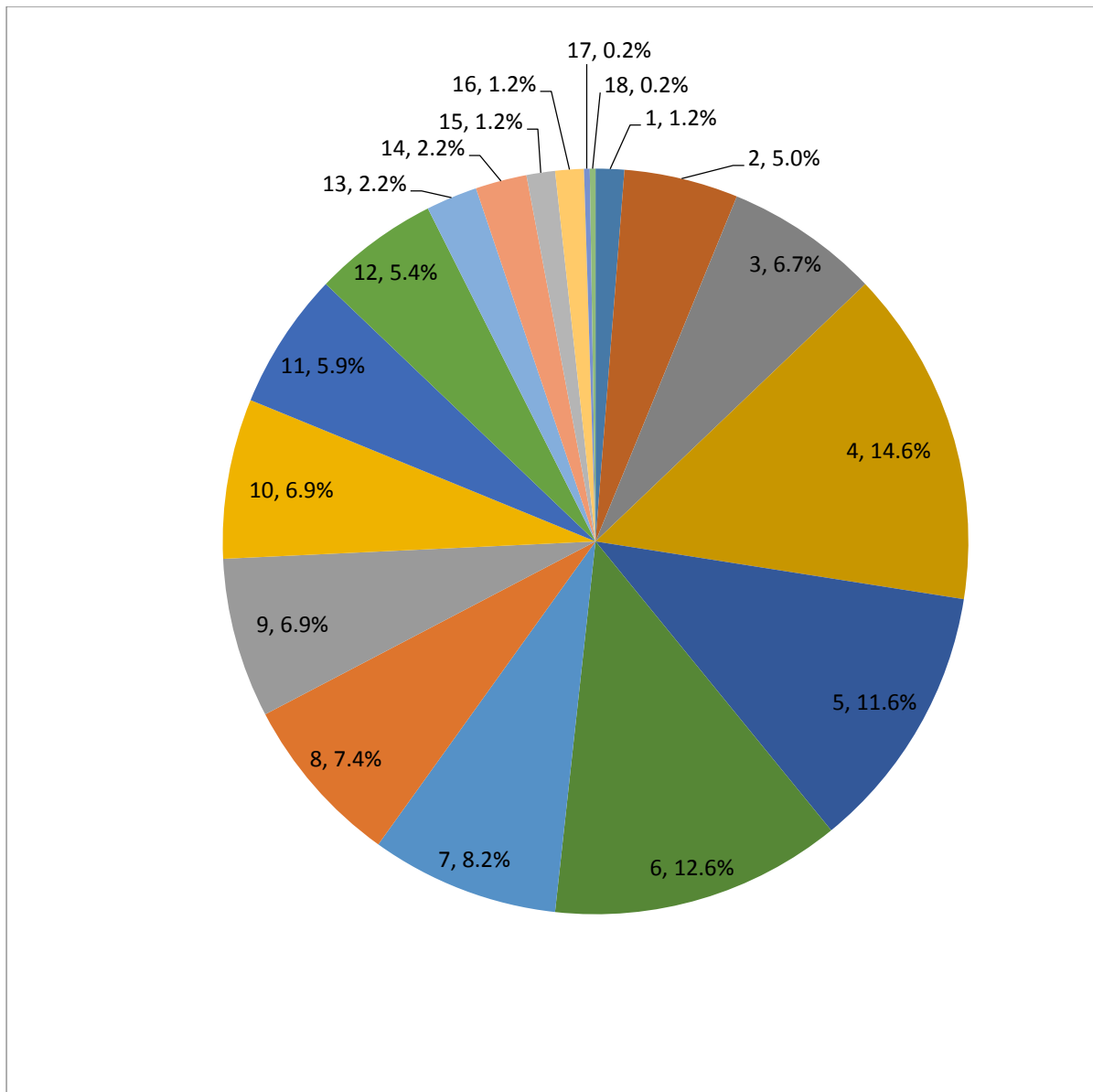


Figure 5.21: The percentage of households facing an exact number of deprivations

Source: Survey data (2015)

5.3 AGGREGATE MULTIDIMENSIONAL POVERTY ESTIMATES

As shown in Table 5.2, the analysis presents the estimates of the multidimensional headcount ratio (H) and the adjusted headcount ratio M_0 in the area using the 18 indicators, for different values of k . It is important to note that each dimension is

equally weighted; each indicator within a dimension is also equally weighted. The implication of each k -value in the estimates using the different weights differs from the connotation when equal weights are considered. With equal weights $k=1$ entails for an individual to be judged multidimensionally poor when that individual is deprived in at least any one of the 18 indicators. With different weights, $k=1$ implies being deprived in at least a dimension or a combination of dimensions the weights of which sum to 1. While all dimensions are equally weighted in this study, all indicators are not equally weighted, as some dimensions appear to have more indicators than others. For example, someone deprived only in floor material is not considered to be multidimensionally poor with $k=1$, neither is someone considered deprived only in room or in fuel for cooking. However, someone deprived only in income or only in education is considered multidimensionally poor, with $k=1$, as well as someone deprived both in fuel for cooking and floor material, TV/radio and room or wall material and cell phone/landline telephone, for example. This example is presented in Table 5.1.

Table 5.1: Weighting structure

Dimensions (weight)	Indicator	Weight for each indicator
Clothing and housing conditions (18/7)	Adequate floors	0.51
	Adequate external walls	0.51
	Adequate roof material and condition	0.51
	No critical overcrowding	0.51
	Clothing	0.51
Air quality (18/7)	Fuel for lighting	0.86
	Fuel for cooking	0.86
	Fuel for heating	0.86
Assets(18/7)	Tv/radio (Information and entertainment: access to media)	0.86
	Cell phone/ landline telephone (communication and access to media)	0.86
	Other assets	0.86
Water and sanitation (18/7)	Access to water source	1.29
	Adequate elimination of sewer waste	1.29
Health(18/7)	Proximity of health facilities	1.29
	Food security	1.29
Household education conditions(18/7)	Educational achievement	1.29
	Literacy	1.29
Household expenditure (18/7)	Household expenditure	2.57

Source: Own calculations

As with any other poverty measure, poverty levels change according to the poverty line chosen; lower poverty lines engender lower poverty estimates and a higher poverty line leads to higher poverty estimates. In other words, as k increases, the number of households that will be classified poor decreases, as well as the breadth of poverty. The k can potentially get any value from zero percent (all are automatically in poverty) to 100% (none is ever poor). In general, for the Alkire and Foster methodology, the k -threshold to identify the poor and non-poor population represents the minimum share of weighted indicators in which a household should

be deprived in order to be identified as poor. Therefore the cut-off point k is the minimum weighted deprivation share that a household must have to be considered poor.

As previously discussed, there is no deterministic technique for selecting this second cut-off point, and much of the analysis in this study referenced to previous studies. The most utilisation of k value was found to be 33%. Among others, Alkire and Santos (2010), Bronfman (2014), Salahuddin and Zaman (2012), Salazar *et al.* (2013) used 33% as k cut-off. The present study considered a k -threshold which is very similar to the k threshold chosen by other researchers in similar frameworks. Table 5.2 provides the estimates of the multidimensional headcount ratio (H) and the adjusted headcount ratio M_0 in the area using the 18 indicators, for different values of k .

Table 5.2: Multidimensional headcount ratio (H) and adjusted headcount ratio (M_0): different k values

K	H	Mo	A
0.51	1.000	0.425	0.425
2	0.980	0.419	0.427
3	0.938	0.413	0.440
4	0.859	0.397	0.463
5	0.735	0.366	0.497
6	0.611	0.326	0.534
7	0.530	0.297	0.561
8	0.421	0.252	0.599
9	0.312	0.200	0.643
10	0.218	0.151	0.692
11	0.149	0.110	0.742
12	0.101	0.080	0.791
13	0.072	0.060	0.830
14	0.057	0.048	0.852
15	0.030	0.027	0.897
16	0.012	0.012	0.937
17	0.005	0.005	0.976
18	0.002	0.002	1.000

Source: Survey data (2015)

As seen in Table 5.2, 0.002% of households are deprived in all dimensions. If identification of the poor is established on the union approach, however, 100% of all households would live in poverty (deprived in one or more indicators) and, on average, they are deprived in dimensions so that the adjusted headcount ratio M_0 is 0.42. Union is attained when k is equal to the lowest weight used. Yet one deprivation may not represent poverty. For example, a household having a grandmother who likes to cook only on a woodstove would have one deprivation, but possibly should not be judged poor. Any poverty index based on the intersection approach would judge the former homeland of Qwaqwa almost poverty free (0.002%). Remember that the *union* approach considers a household as multidimensionally poor if that household falls short in only one dimension or equal to the minimum weight across all dimensions ($k=0.51$ in the case of this study) whereas, a household is classified as multidimensional poor in terms of intersection approach if the household is deprived in *all* dimensions ($k=d$) (Atkinson, 2003:51). The methodology devised by Alkire and Foster does not pursue either the union approach or the intersection approach. The Alkire and Foster methodology undertakes an intermediate method, in a peculiar way.

If the cut-off value $k=4$ is chosen instead, then approximately 85% of the households are deprived, on average, they are deprived in 46.3% of total dimensions and the adjusted headcount ratio is 0.397. The average poverty A rises with the increase of cut-off point k , while H and M_0 decrease when k increases. At a higher cut-off point k , those falling below the poverty line, on average, encounter more deprivations than those who fall below the poverty line at a lower cut-off point k .

Approximately 61% of the households are deprived in 53.4% of total dimensions, on average, with M_0 being 0.32 at $k=6$. For $k=8$, about 42% of households are deprived, on average, they are deprived in 59.9% of all indicators with $M_0=0.25$. The results at $k=10$ indicate that only 22% of households are deprived, on average, they are deprived in 69.2% of all indicators. The results at $k=12$ indicate that only 10% of the households are deprived, on average, they are deprived in 79.1% of the total indicators, with the intensity of poverty $M_0=0.101$. For $k=14$, about 5% is deprived, on average, in 85.2% of all indicators with $M_0=0.25$. The estimates are smaller for $k=16$

and only 1% of the households are deprived in at least 93.2% of all indicators, on average. When all poor individuals are deprived in d dimensions, M_0 coincides with H , as usually happens with the intersection approach. This is the case where at $k=18$, $H=M_0=0.002$ and $A=1$.

The multidimensional poverty incidence (H) estimates can be related to the one-dimensional (income) poverty incidence, which is 40% in the case of the current study. The estimates corresponding to various values of k should always be presented when it comes to multidimensional poverty incidence (H). Nevertheless, for policy purpose, it is always important to select a value of k that could be a reasonable intermediate threshold, which directed the attention to a set of individuals, narrow enough to confirm that they are indeed multidimensionally poor and broad enough to incorporate individuals that, although not experiencing a high number of deprivation, are still facing deprivation in several relevant ones.

If one had to choose a value to define policy, $k=6$ (33%) might be a reasonable intermediate cut-off which focused the attention on a set of people narrow enough to ensure that they are indeed multidimensionally deprived and broad enough to include people that, even if not deprived in a high number of dimensions, still experience deprivation in several relevant ones. The poverty cut-off (k) is set at 33.33% that is to say $k=6$. A pertinent problem is to find how each dimension contributes to the overall deprivation. This can be examined by breaking down M_0 by dimension, which is accurately one of the advantages of Alkire and Foster measures. In terms of policy plan, this kind of analysis appears remarkably indispensable. Once governments are faced with the demanding duty of allocating public budget among aspects of poverty for their alleviation, it is required to take into account the contribution of each aspect to the overall poverty estimate. Figure 5.22 summarises the contribution of deprivation in each dimension to overall M_0 in the former homeland of Qwaqwa.

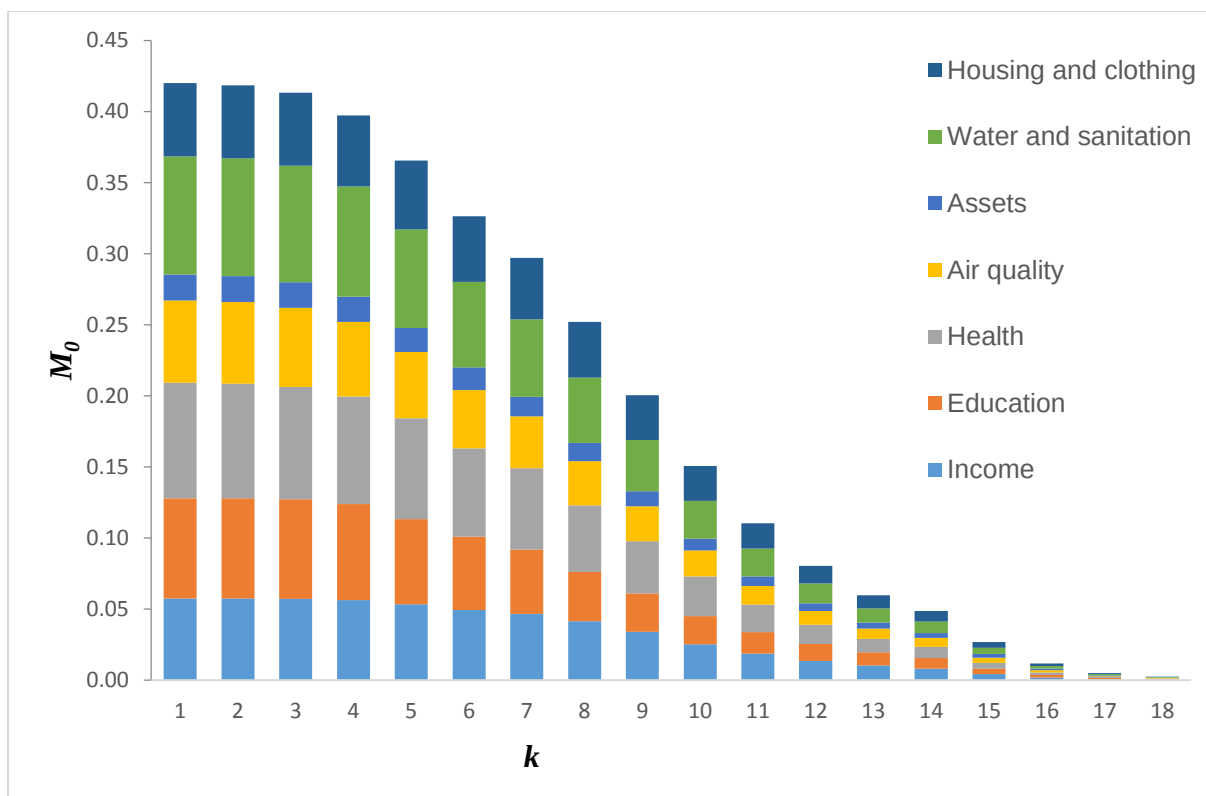


Figure 5.22: Multidimensional adjusted headcount ratio (M_0): contributions by each of the seven dimensions with different k

Source: Survey data (2015)

Figure 5.22 presents the contribution of each dimension to the intensity of poverty M_0 in the area in relation to the changes in cut-off k . For a meaningful interpretation, the contribution of each dimension is expressed in percentage in the following discussion.

It can be seen that the ranking is similar for $k=1$ and $k=2$, whereas deprivation in water and sanitation give the highest contribution to M_0 (19.78% and 19.81%, respectively) followed by health (19.32% and 19.22%, respectively), education (16.84% and 16.90%, respectively), air quality (13.81% and 13.77%, respectively), income (13.64% and 13.69%, respectively), housing, and clothing (12.29% and 12.28% respectively). Poverty in assets gives the smallest contribution to M_0 , with only 4.32% and 4.34%, respectively.

For $k=3$ and $k=4$, the rankings are similar to $k=1$ and $k=2$, except that, with the former, income becomes the third and switches places with air quality. Given $k=5$ and $k=6$, most importantly health is the highest contributor to the breadth of poverty (19.40% and 19.06%, respectively), followed by water and sanitation (18.96% and 18.46%, respectively), education (16.40% and 15.80%, respectively), income (14.61% and 15.10%, respectively), housing and clothing (13.25% and 14.16%, respectively), air quality (12.74% and 12.53% respectively) and assets (4.64% and 4.89%, respectively). With $k=7$, the ranking is similar to $k=6$, except that income switches place with education. With $k=10$ and $k=12$, the ranking order is similar with health being the highest, followed by water and sanitation, income, housing and clothing, education, air quality and assets. In many cases it is either health or water and sanitation deprivation that contribute most to the intensity of poverty in Qwaqwa. Generally, and by definition, as k is closer to the maximum k value, the structure of contributions by each dimension moves toward an equal contribution within the dimension. When $k=17$, for instance, each dimension contributes 14.63%, except air quality, with 12.20%. Finally, at $k=18$, all dimensions contribute 14.29% each.

5.3.1 Overlapping and correlation between dimensions

The heavy emphasis on income poverty alleviation is constructed on the absolute assumption that monetary poverty measures detect effectively who is poor. A growing empirical literature records a mismatch between non-monetary and monetary deprivations. This directs researchers to investigate the link between household income and deprivation indicators, how it should be interpreted and which conclusions should be drawn. The initial foundation to concentrate poverty analysis completely on income is that income is greatly correlated with attainments in other dimensions, such as health. If this were the case, by targeting the income-poor, one would also be targeting the deprived in other dimensions. This does not seem to be the case in Qwaqwa. A first simple application is to examine the Spearman correlation between any pair of variables. Table 5.3 presents the coefficient between deprivations in the different pairs of dimensions used to estimate multidimensional poverty (the complete table refers to appendix I).

Table 5.3: Spearman correlation coefficients between deprivations

	Income	Health proximity	Food security	Education	Literacy	Water	Toilet	Lighting fuel	Floor	Walls
Income	1									
Health proximity	0.079	1								
Food security	.277**	.117*	1							
Education	-.162**	0.046	-0.09	1						
Literacy	0.026	0.057	-0.057	.432**	1					
Water	.114*	.273**	0.051	-0.027	-0.028	1				
Toilet	-0.055	.213**	-.148**	.215**	.154**	.235**	1			
Lighting fuel	.262**	.238**	.202**	0.063	0.015	.297**	-0.028	1		
Cooking fuel	.152**	.183**	0.094	.169**	.208**	.250**	.122*	.243**		
Heating fuel	-.111*	0.024	-.156**	.176**	.107*	.176**	.371**	0.043		
Floor	.262**	.401**	.185**	-0.074	-0.015	.452**	-0.017	.524**	1	
Walls	.244**	.389**	.194**	-0.08	-0.009	.424**	-0.013	.478**	.779**	1
Roof	.218**	.427**	.205**	-0.048	-0.059	.406**	0.029	.450**	.631**	.679**
Room	.309**	.190**	.239**	-.135**	0.043	.302**	-0.031	.284**	.533**	.533**
Clothing	.262**	.238**	.202**	0.063	0.015	.297**	-0.028	1.000**	.524**	.478**
TV/radio	.179**	.126*	0.092	0.067	0.045	.224**	-0.002	.176**	.247**	.252**
Telephone	.100*	-0.028	0.059	0.041	0.084	0.091	-0.07	.197**	0.077	.100*
Other assets	.107*	-0.064	.163**	0.081	-.108*	0.057	.152**	.197**	.128*	0.072

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Source: Survey data (2015)

It can be seen that not all pairs are correlated. Even the income deprivation is not correlated with all other aspects of deprivation, while it is claimed to be the measure of poverty that reflects deprivation in other dimensions. In Table 5.3, the correlations between income poverty and literacy deprivation, proximity of health facilities deprivation, lighting fuel deprivation and toilet deprivation are not statistically significant. In the case of the present study, the majority of illiterates are old-aged people who receive a monthly old-age pension of at least R1 250, while some of the employed people do not earn that salary per month. Similarly, income deprivation would not reflect any access to a health facility, as it is either located or not within 30 minutes by means of the usual transport of households, as defined in this study. The

coefficients of those variables that are correlated with income deprivation are not the highest (never exceed 0.309).

It is shown in the table that deprivation in income has a low correlation with deprivation in other dimensions. This emphasises the arguments of this study that deprivation in one dimension does not satisfactorily justify the deprivation in any other dimension. Therefore poverty needs to be analysed according to a multidimensional approach, for a meaningful investigation and policies for its alleviation. A multidimensional analysis of poverty is essential, as a policy aimed at the income poor might not benefit other portions of the population deprived in other dimensions. Among the advocates of money-metric measures of poverty, it is generally said that income or its proxy, expenditure, has a strong correlation with other dimensions. Households' expenditure levels therefore justify households' attainments on each of the other dimensions of wellbeing. Measuring poverty in terms of income or expenditure results in explaining deprivation in other dimensions. Yet, in the former South African homeland of Qwaqwa, and in Bhutan (Santos and Ura, 2008), Pakistan (Naveed & Tanweer-ul-Islam, 2010) and Chile (Bronfoman, 2014), empirical evidence contests this principle.

To re-emphasise the fundamental argument, the relationship between the level of income of the household, and the number of deprivations associated with it, lead to a need for investigating whether or not there is overlap between the group of poor, acknowledged by the monetary measure, and the group of the poor detected by the multidimensional approach.

In further analysing the context of multidimensional poverty, Table 5.4 shows the proportion of population that is income non-poor, but multidimensionally poor, and the proportion of the population that is income poor, but multidimensionally non-poor, for the different k . By definition, the proportion of the income non-poor that are multidimensionally poor declines as k rises, being zero when $k=d$, given that all individuals are deprived in all considered dimensions, income included. Similarly, the proportion of income poor that are not multidimensionally poor goes up as k rises. It takes the values from 0 when $k=1$, given that all the income poor are identified as

multidimensionally poor, to a proportion close to the aggregate income poverty incidence when $k=d$, since in that case only the few income deprived that are also deprived in all the other dimensions are considered multidimensionally poor. In other words, in being considered multidimensionally poor by using the income poor variable, a non-depreciable error will be inevitable, as only income poor would be captured but not the multidimensionally poor, hence a Type-I error.

The other scenario will be that part of the multidimensionally poor will be excluded for not being income poor and committing the Type-II error (Santos & Ura, 2008:17). If the minimum possible k value is to be used to identify the multidimensionally poor, then the income approach is likely to minimise the Type-II error, maximising the Type-I error. This is different if one considers that $k=d$, and becomes the deprivation determining cut-off for the multidimensionally poor. With this, by using the income approach, Type-I error is minimised, while Type-II error is maximised. However, for the k -values in the middle of the extremes, in using the income approach there would always be some combination of each error type. Further demonstration on this lack of consistency between the income and multidimensional poverty levels is provided in Table 5.4.

Table 5.4: Lack of overlap between income and multidimensional poverty

K	Income non-poor but multidimensionally poor	Income poor but multidimensionally non- poor
0.51428	59.901%	0.000%
2	57.921%	0.000%
3	53.713%	0.000%
4	46.535%	0.743%
5	36.139%	2.723%
6	26.485%	5.446%
7	20.297%	7.426%
8	13.119%	11.139%
9	7.426%	16.337%
10	4.208%	22.525%
11	1.733%	26.980%
12	0.743%	30.693%
13	0.000%	32.921%
14	0.000%	34.406%
15	0.000%	37.129%
16	0.000%	38.861%
17	0.000%	39.604%
18	0.000%	40.099%

Source: Survey data (2015)

The main difference between income measure and multidimensional measure is that the former presents very conservative estimates of poverty. Multidimensional poverty estimates show that 61% of households in Qwaqwa fall below the poverty line of $k=6$ and 52% at $k=7$. These are significantly higher than those using the income poverty line, which provides only 40% of households to fall below the income poverty line. Regardless of providing conservative poverty estimates, income measure generates errors of both types by pronouncing multidimensionally non-poor households as poor and multidimensionally poor households as non-poor. In Table 5.4, if $k=6$ is used as a cut-off point, then 5.446% of households identified as poor by income approach

are multidimensionally non-poor and as much as 26.48% of households identified income non-poor are multidimensionally poor.

Similarly, if $k=9$ is taken as the poverty line, as many as 16.33% of households identified as poor by income measure are realised to be multidimensionally non-poor, whereas 7.42% of households categorised as non-poor by income are found to be multidimensionally poor. A certain number of the households identified non-poor by income are discovered to be having even 11 and 12 deprivations out of a total of 18. Therefore income does not succeed in correctly detecting households suffering multiple deprivations. Note that reducing one type of error by modifying the cut-off point k amplifies the other type of error, as indicated in Table 5.4.

Many studies have repetitively evidenced the fact that expenditure or income approach declares different individuals as poor from other deprivation dimensions (Alkire & Seth, 2009; Bradshaw & Finch, 2003; Klasen, 2000; Laderchi *et al.*, 2003; Naveed & Tanweer-ul-Islam, 2010; Nolan & Whelan, 2011; Santos & Ura, 2008; Whelan *et al.*, 2004)

5.3.2 Decomposing poverty

Decomposition is an advantageous property granting the analysis of poverty by subgroups. It is forthright to apply better poverty-decreasing policies by focusing on the types of deprivations shaping every single subgroup. The next subsections cover the analysis of multidimensional poverty among eight villages of Qwaqwa and the relationship between multidimensional poverty and household size.

5.3.2.1 Analysis at the village level

In analysing the village level poverty, Table 5.5 presents estimates for each village of Qwaqwa, based on 18 indicators, with $k=6$. It displays the income headcount ratio in each village. The analysis of estimates of income and multidimensional estimates is important in each village. In Table 5.5, columns (1) and (2) represent the estimates for income head count ratio H , while (3), (4), (5) and (6) show multidimensional H and M_0 respectively. Each village has corresponding estimates in every measure,

which is given in descending order that are shown in brackets of every estimate so that the ranking can be analysed. Villages are ranked corresponding to their contribution to each of the aggregate measures and are in brackets of each estimate so that they can be compared.

The first interesting point to record is that the village having the highest estimates of income H was not necessarily the one having the highest estimates of multidimensional H and M_0 . Similarly, the village with the lowest estimates of income H was not necessarily the one having the lowest estimates of multidimensional H and M_0 . Even though the change in the rank order of the villages when moving from income H to M_0 is not too noticeable, there are some interesting cases, such as the case of Mphatlalatsane, Ntshehele, Qholaqhoe and Matsikeng. Note that when ranked in descending order by income H , the village of Mphatlalatsane ranks in third place, the village of Ntshehele ranks in fifth, the village of Qholaqhoe ranks in sixth place, while Matsikeng ranks the eighth. However, when ranked by M_0 , Mphatlalatsane is ranked in the fifth place, with the M_0 estimate being 0.25, and Ntshehele ranks in seventh place, with an M_0 estimate of 0.23. Both villages descend two places in the ranking. Qholaqhoe ranks fourth, with M_0 being 0.27 and Matsikeng ranks eighth, with M_0 being 0.23, both climbing two places in the ranking, as shown in Table 5.5.

Table 5.5: Income and multidimensional headcount ratio H and multidimensional adjusted headcount ratio (M_0) decomposed by villages

Village	Income H	Contri. Overall income H (%)	Multi. H $k=6$	Contrib. overall multi H ($k=6$)	M_0 ($K=6$)	Contrib. overall $M_0(k=6)$
Kudumane	0.76 (1)	21.60(1)	0.93(2)	17.41(1)	0.55(2)	19.21(2)
Boitekong	0.67(2)	17.28(2)	0.98(1)	16.60(2)	0.69(1)	22.00(1)
Mphatlalatsane	0.58(3)	15.43(3)	0.51(5)	8.91(7)	0.25(5)	8.06(6)
Mabolela	0.40(4)	10.49(5)	0.74(3)	12.55(4)	0.38(3)	12.20(4)
Ntshehele	0.34(5)	9.26(6)	0.50(7)	8.91(8)	0.23(7)	7.55(8)
Qholaqhoe	0.31(6)	8.02(7)	0.60(4)	10.12(5)	0.27(4)	8.48(5)
Bochabela	0.24(7)	14.81(4)	0.40(8)	16.19(3)	0.19(8)	14.59(3)
Matsikeng	0.11(8)	3.09(8)	0.50(6)	9.31(6)	0.23(6)	7.91(7)

Source: Survey data (2015)

The explanation for this sort of change in the relative positions of these villages can be found in Figure 5.23, where the eight villages have been ranked from highest to lowest by the M_0 estimates. The bar for each village depicts the composition of multidimensional poverty by each of the dimensions. There it can be seen that, in the case of Qholaqhoe, income is the fourth contributor to the intensity of poverty and explains only 15.33% of the overall deprivation. In this village, however, there are other considered dimensions that highly influence poverty more than income does. Deprivation in education accounts for 21.08% of the overall multidimensional poverty estimate, deprivation in health accounts for 17.25% and deprivation in water and sanitation accounts for 16.61% of M_0 . These acute deprivations in the mentioned dimensions appear to be associated with the fact that Qholaqhoe village moved from the sixth place in income H to fourth place in multidimensional H and M_0 . Using the cut-off $k=6$, the Boitekong village records the highest incidence and breadth of poverty, with as many as 98% of households living in poverty with $M_0=0.69$, followed by Kudumane, where 93% fall below the poverty line, with M_0 being 0.55. In Boitekong, deprivation in education and water and sanitation each account for 18.06%, health, housing and clothing, income, air quality and assets deprivation

record 17.81%, 15.32%, 13.67%, 12.85% and 4.23%, respectively. It is clear that, in this case of Boitekong, policy-makers would not prioritise income while deprivation in water and sanitation, health and housing and clothing are more acute. Similar conditions prevail within other villages, where income is not among the highest or in the lowest contributors to the M_0 estimates.

Mphatlalatsane village is worthy of being mentioned as the sole village where income deprivation accounts for a very significant part of overall multidimensional poverty and becomes the highest part of M_0 estimates (22.84%). However, this does not mean that deprivation in income would suffice for a comprehensive poverty analysis, since the village in question is also highly deprived in the other considered dimensions (health, for example, accounts 22.84 %), suggesting that there are coupled disadvantages, which make them particularly vulnerable.

In Matsikeng village, income deprivation is one of the lowest and accounts for only 4.22% of M_0 estimates. This explains, in both cases (Mphatlalatsane and Matsikeng), the reason why there was some striking changes in the rank order when moving from Income H to M_0 (Table 5.5). The lowest degree of poverty is observed in Bochabela where at least 40% of households are found to be in poverty, with M_0 being 0.19. The high levels of deprivation in the other dimensions, compared to the income deprivation, explain the considerable variation between the ranking by the adjusted headcount ratio M_0 and income H (shown in Figure 5.23).

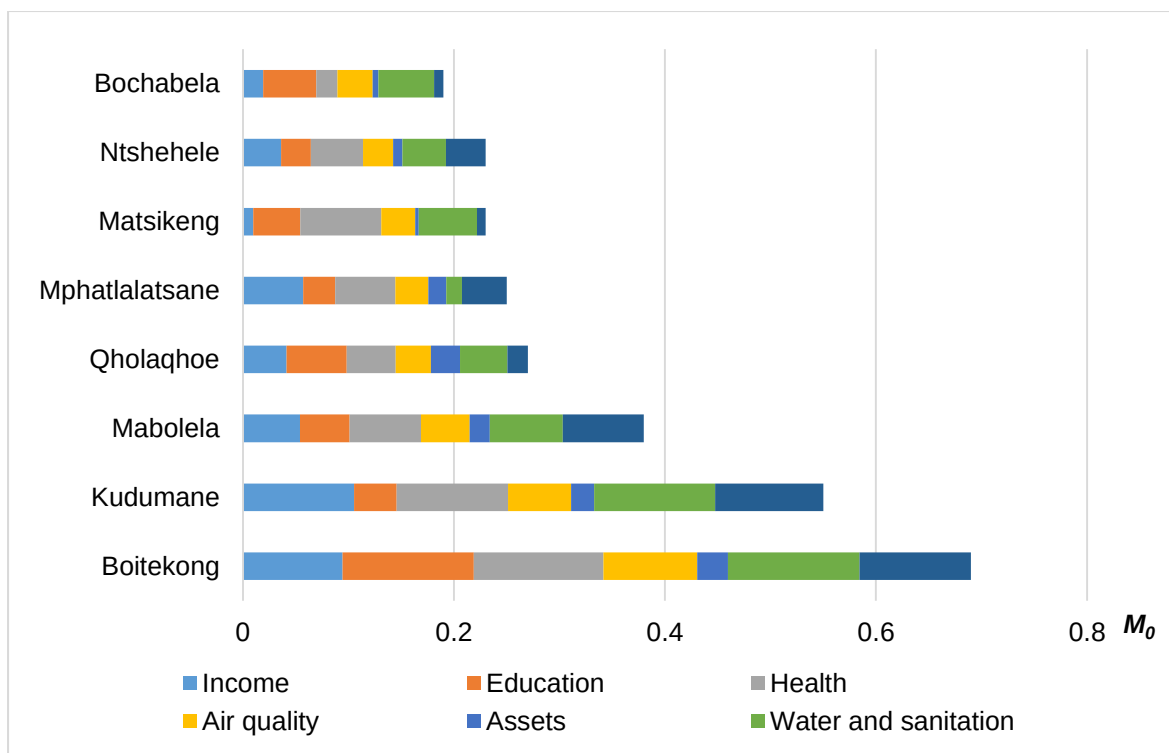


Figure 5.23: Composition of the adjusted headcount ratio M_0 in each village of Qwaqwa

Source: Survey data (2015)

The useful property of Alkire and Foster's measures, the decomposition of poverty measures, is also being explored in terms of the link between multidimensional poverty and household size.

5.3.2.2 Multidimensional poverty and household size

The literature contains an abundance of evidence indicating that large households in poor communities are linked to higher levels of income poverty (Baiyegunhi & Fraser, 2010; Klasen, 2000; Jalan & Ravallion, 1998; Lanjouw & Ravallion, 1995; Sekhampu, 2013; Woolard & Klasen, 2005). High population growth has been found to significantly hamper economic growth, as well as hinder progress in areas including inequality, health and education (Klasen, 2004:1). In terms of multidimensional poverty measures, what is unclear, however, is the extent to which these differences across household sizes represent real differences in the level of

welfare, or are a result of the way the multidimensional measure is constructed. Multidimensional poverty status is assigned to individuals based on the experience of the household as a whole, which in, turn, depends on the experience of just one member. Therefore, the more household members, the more likely that someone in the household will have experienced that deprivation. For instance, the larger the household, the greater is the probability that it has one person who might be food insecure, illiterate or does not have enough decent clothing. By using a multidimensional poverty analysis on the household, all members will be classified as poor as a result. Conversely, indicators that are related to the physical features of the household tend to be less directly affected by a change in the number of household members (i.e. access to adequate type of sanitation or adequate water source). The relationship between household size and the adjusted headcount ratio in Qwaqwa is presented in Figure 5.24.

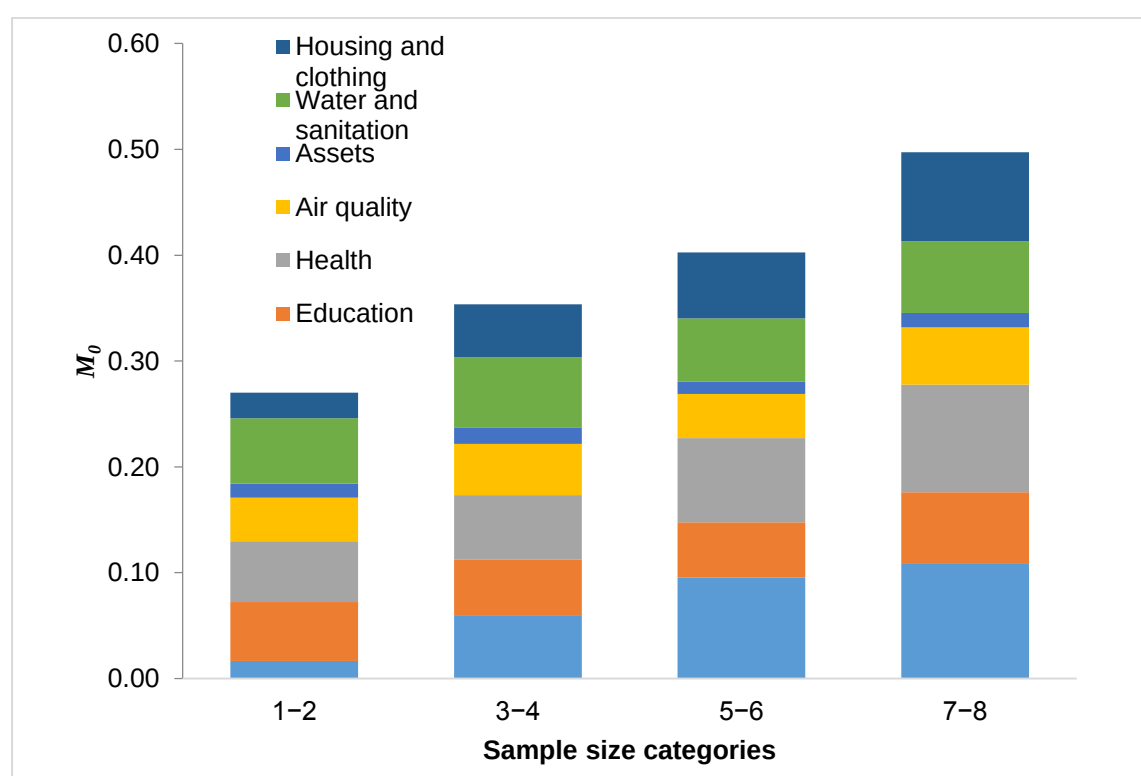


Figure 5.24: The relationship between household size and the adjusted headcount ratio in Qwaqwa

Source: Survey data (2015)

As observed from Figure 5.24, the poverty level is positively related to the household size. In other words, increase in household size renders the household more vulnerable to multidimensional poverty, as demonstrated by high poverty level corresponding to the large household size. The results are in agreement with the research of Levine *et al.* (2012:12) which had revealed a similar pattern between household size and poverty. Figure 5.24 shows that dimensional poverty relates differently from household size. With the specified dimensions of housing and clothing, water and sanitation, education, health and income, the results have shown that housing, health and income poverty dimensions relatively increases more with the increase in household size in contrast to the rest of the categories, which reveal prior expectations, as they are not greatly associated with the household size. For example, water and sanitation where an increase in household size has no effect on the availability of the health facility, air quality, either the household is small or big, the fuel used might not change with household size. Another example is the assets availability; the availability of the asset in the household is not greatly influenced by household size. This implies that dimensional poverty analysis reveals more practical forms of intervention as it provides premise for specific intervention in relation to poverty dimension.

The adjusted headcount ratio M_0 that has been the centre of the discussion captures two very indispensable aspects of poverty, namely incidence and intensity. This is because the M_0 is the product incidence of poverty (H) and the breadth of poverty (A) among the poor. The adjusted headcount ratio, however, does not take into account the third crucial aspect, which is the inequality among the poor (Alkire *et al.*, 2015:1). Although the ultimate aim is to eliminate poverty, not just to decrease inequality across the poor, the consideration of inequality is important, since the very same average intensity is not able to show how widely different levels of inequality across the poor can be. The following section discusses how inequality across the poor is analysed, based on the adjusted poverty gap M_1 and squared poverty gap M_2 .

5.3.3 Inequalities among the poor

The development of a society stays incomplete if the situations of those tormented by poverty are not improved. According to Jenkins and Lambert (1997:317), the three I's of poverty, namely, Incidence, Intensity and Inequality, should be taken into account in poverty analysis. Any policy strategy for reducing poverty follows the result which may be shaped by the method utilised in evaluating the improvement of the poor, which is generally a poverty measure. The poverty measure, whether assessing incidence, intensity or inequality has strong effects on the motivations of a policy-maker (Seth & Alkire, 2014:1). A measure that merely detects the incidence of poverty, without the breadth or inequality among poor, would generate motivations for a policy-maker who just wants to display a big decrease in overall poverty, to improve the lifestyle of the least poor but which will absolutely lead to policies that would intentionally disregard the acutest poor. Alkire and Foster's family of measures, M_0 and M_1 , captures both incidence and breadth of poverty that can assist in targeting the poorest, as well as the least poor. Poverty can be alleviated by decreasing its incidence or by decreasing its breadth, but none of them guarantees that the decrease would be gained by those poor with the highest poverty. Thus, over-riding motivations to the policy-maker to prioritize the situations of the most poor are not provided.

The methodology of computing M_0 was based on a dichotomisation of data into deprived and non-deprived states, so it does not make use of any dimension-specific information on the depth of deprivation. Consequently, it will not satisfy the traditional monotonicity requirement that poverty should increase as a poor person becomes more deprived in any given dimension. However, when some data are cardinal, the class of dimension-adjusted FGT measures yields the adjusted poverty gap, given by $M_1=HAG$ and adjusted squared poverty gap, defined by $M_2=HAS$ (Batana, 2008:7; Alkire and Seth, 2009:12-13). The adjusted poverty gap M_1 indicates the incidence, breadth and depth of poverty (Alkire & Foster, 2011b:479; Alkire & Santos, 2013a:245; Alkire & Seth, 2009:13). The depth of poverty is defined as the weighted average of dimension-specific poverty gaps. Simply, it is the gap G between poverty and the poverty line. The adjusted squared poverty gap M_2 reflects the severity of

poverty by emphasizing people or households that are severely deprived (Alkire & Foster, 2011b:479; Alkire & Santos, 2013a:245; Alkire & Seth, 2009:13). It is expressed by the product of the percentage of multidimensional poor H , the average deprivation across the poor A and average squared poverty gap among the poor S (average severity of the poor). The adjusted FGT measures in Qwaqwa as k varies are presented in Table 5.6:

Table 5.6: Poverty measures as cut-off k is varied

K	H	G	Mo	M1	S	M2
1	1.000	0.556	0.425	0.236	0.412	0.175
2	0.980	0.556	0.419	0.233	0.412	0.172
3	0.938	0.555	0.413	0.229	0.410	0.169
4	0.859	0.552	0.397	0.219	0.406	0.161
5	0.735	0.551	0.366	0.201	0.402	0.147
6	0.611	0.547	0.326	0.178	0.394	0.129
7	0.530	0.547	0.297	0.162	0.392	0.116
8	0.421	0.541	0.252	0.136	0.382	0.096
9	0.312	0.540	0.200	0.108	0.378	0.076
10	0.218	0.541	0.151	0.081	0.378	0.057
11	0.149	0.540	0.110	0.059	0.374	0.041
12	0.101	0.538	0.080	0.043	0.368	0.030
13	0.072	0.540	0.060	0.032	0.368	0.022
14	0.057	0.546	0.048	0.026	0.372	0.018
15	0.030	0.546	0.027	0.015	0.362	0.010
16	0.012	0.562	0.012	0.007	0.377	0.004
17	0.005	0.540	0.005	0.003	0.356	0.002
18	0.002	0.579	0.002	0.001	0.370	0.001

Source: Survey data (2015)

It is clear that $H > M_0 > M_1 > M_2$ for all k , due to the way they are computed. For example, M_0 is obtained from H , multiplied by the average deprivation share A . Except in the case where all poor are deprived in all dimensions for some k , hence $H = M_0$ for these k , M_0 is usually lower than H . M_1 is calculated in the existence of some cardinal and is the product of M_0 and the average poverty gap G , while M_2 is the product of M_0 , with the average squared poverty gap S over all indicators and all

poor people. Given that the average poverty gap G is inferior to 1, the average squared poverty gap will be lower than the average poverty gap G . Consequently, M_1 will be inferior to M_0 and M_2 will also be inferior to M_1 .

In the presence of $M_1=HAG$, the most pertinent factor is the average gap, which is $G=0.547$ when $k=6$. This indicates that the average achievement of a poor person in a deprived state is 45.3% of the respective cut-off, which is quite a large gap. If all deprived attainments were 0 and G was 1, then M_1 and M_0 would get a similar value. From Table 5.6, at $k=6$, $M_2=HAS$ shows a further decrease from M_1 (0.178 rather than 0.129) and indicates the severity of poverty S . If all normalised gaps were identical, it would have been expected for S to equal G^2 (or 0.299 in this case). Instead, $S=0.394$, and this larger value means that there is inequality among deprived states of the poor. These conclusions are drawn referring to the study of Alkire and Foster (2010). The G was found to be 0.44 and $S=0.30$ and these estimates were judged to show a large gap and large inequality among deprived states of the poor (Alkire & Foster, 2011b:485). However, for a more meaningful analysis, the following subsection is undertaken with regard to the analysis of M_1 and M_2 at village level, when $k=6$.

There are, however, some limitations with this approach, mainly on policy relevance, its interpretation, use of different indices and poor usable working framework. On policy relevance, by expressing poverty as a weighted average of dimensional deprivations, the approach compromises a crucial policy-relevant property (Alkire & Foster, 2013). Emanating from the same source, despite the inequality-adjusted poverty indices being useful for poverty comparisons across space and time, the interpretation of the overall index can prove to be cumbersome and not easy to interpret and may easily hinder its policy application. With the property of further breaking down the inequality-adjusted poverty indices into different partial indices, it calls for separate capturing of the incidence, intensity and inequality across the poor, in order to properly understand the overall poverty. All these lead to an ambiguous framework in capturing poverty among subgroups in a given population for appropriate action, as an overall improvement in poverty may be coupled with inconsistencies. For example, the improvement may be associated with a reduction

in inequality among the poor and a substantial uniform of reduction in intensities across the poor. A simultaneous, large non-uniform improvement in poverty across sub-groups can also be observed.

5.3.3.1 Inequalities among the poor at village level

Inequalities among the poor at village are presented in Table 5.7 for comparison purposes. The inequality-adjusted poverty indices are advantageous when comparing poverty across time and space (Seth & Alkire, 2014:2). In the table, the average poverty gap G and M_0 that were used to compute M_1 as well as the average severity of the poverty S used in calculating M_2 .

Table 5.7: Decomposition of poverty measures by village

Village	G	M0	M1	S	M2
Boitekong	0.546	0.691	0.377	0.395	0.273
Kudumane	0.530	0.551	0.292	0.363	0.200
Mabolela	0.541	0.383	0.207	0.368	0.141
Qholaqho	0.548	0.266	0.146	0.389	0.104
Matsikeng	0.632	0.227	0.143	0.510	0.116
Mphatlalatsane	0.552	0.247	0.136	0.386	0.095
Ntshehele	0.550	0.226	0.125	0.391	0.088
Bochabela	0.525	0.194	0.102	0.397	0.077

Source: Survey data (2015)

As indicated in Table 5.7, the villages with the highest M_0 and M_1 have also the highest estimates of M_2 . This implies that in those villages the multidimensionally poor households are far from ceasing to be so (shown by M_1) and they are accompanied by high inequality. Boitekong village has the highest estimates of the adjusted multidimensional measures ($M_0=0.69$, $M_1=0.377$, $M_2=0.273$), followed by Kudumane (0.551, 0.292, 0.2, respectively) and Mabolela (0.383, 0.146, 0.104, respectively). Bochabela has the lowest M_0 (0.194), M_1 (0.102) and M_2 (0.077).

5.3.4 Robustness of village rankings to changes in the poverty cut-off k

Similar to the single dimensional cut-off vector z , the selection of multidimensional cut-off k , which is the total weighted indicators in which a household should be deprived to be regarded as poor, is normative. In the multidimensional headcount ratio, k can vary from 0.51, which is the smallest indicator weight, to 18, the total number of indicators considered. Even $k=1$ appears to be a very low threshold, both empirically and normative: the deprivations in one indicator of housing and clothing, assets or air quality may not represent poverty. The normative reasoning is based on the idea that, although a household might have one deprivation because of the preference (for instance, cooking with wood), it is more likely that households with manifold deprivations in these same primitive indicators have not preferred these. The empirical argument is that, independently, every indicator might not be an accurate proxy for one feature of poverty. At the other extreme, above $k=11$, poverty turns out to be zero in some villages and the estimates therefore appear to be irrelevant in those villages. Thus, in the M_0 , the series of possible values for k is rather limited.

A key empirical concern is how sensitive the village rankings are to variations in this k cut-off, at least for the series of relevant values. Other studies (Alkire & Santos, 2013b; Batana, 2008; Dehury & Mohanty, 2015; Kabubo-Maraira *et al.*, 2011) have found various comparisons to be relatively robust to variations in k , particularly over a certain subset of reasonable values. Referring to these studies, certain fundamental dominance analysis was undertaken. Given two villages, A and B; B is pronounced to dominate A if A's M_0 or H is superior or equal to B's M_0 for all k values, and is strictly superior for at least one k value. This means that B has lesser poverty than A, irrespective of the k -cut-off. Such tests were performed among eight villages in Qwaqwa. Figure 5.25 illustrates some dominance relations from eight villages in Qwaqwa.

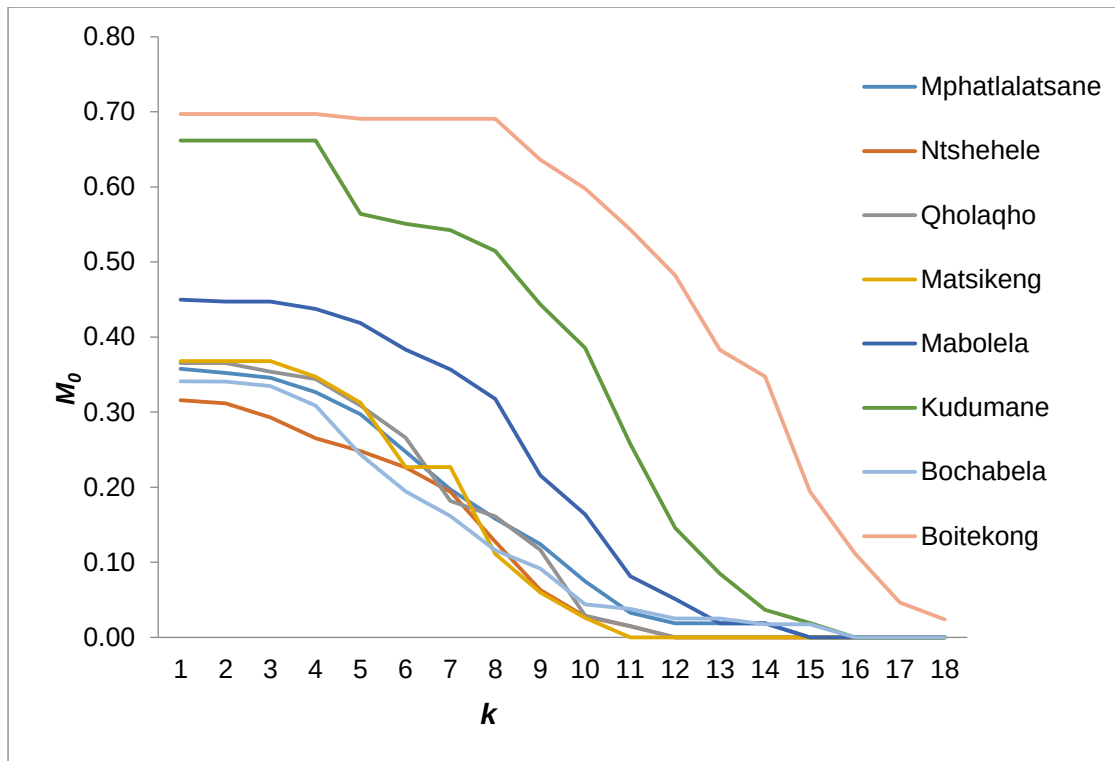


Figure 5.25: Poverty comparisons for eight villages in Qwaqwa as k is varied: comparison in M_0

Source: Survey data (2015)

As presented in Figure 5.25, two highest poverty villages (Boitekong and Kudumane), one medium village (Mabilela) and five villages with relatively low poverty level (Bochabela, Matsikeng, Mphatlalatsane, Ntshehele and Qholaqho) demonstrate the dominance relations. Every curve in the figure portrays the level of poverty in the village when k is varied. Dominance is then possible between two villages when any curve lies above or below another for all possible values of k . When two curves cross, it means the absence of dominance. It was found that in 68% of the total possible pairs of villages, there is a dominance relation when k varies from 0.51 to 10, meaning that one village is unequivocally less poor than another.

In Figure 5.25, for all k values, Boitekong is dominated by all villages whereas Kudumane is dominated by all villages except Boitekong. From $k=1$ to $k=12$,

Mabolela village is dominated by Bochabela, Matsikeng, Mphatlalatsane, Ntshehele and Qholaqho. At $k=1$ to $k=10$, it is seen that Mphatlalatsane is dominated by Bochabela. Following the least k values considered ($k=1$ to $k=10$), in Figure 5.25, no dominance relationship exists between Mphatlalatsane and Ntshehele, Mphatlalatsane and Qholaqho, Mphatlalatsane and Matsikeng, Ntshehele and Qholaqho, Ntshehele and Matsikeng, Qholaqho and Matsikeng, Bochabela and Matsikeng, Bochabela and Qholaqho and Bochabela and Ntshehele, since all these pairs of curves cross each other. There are still possibilities of dominance between any village, from one pair and any village from another pair. The intersections of the curves denote possible discontinuities in deprivations along k and non-dominance relations and are thus further illustrated by the sharp bends. These non-dominance relations arise from the different distribution of the mean and variance in the case of a normal distribution (Batana, 2008:23). Comparing Figure 5.25 and 5.26, the curves representing M_0 appear to be smoother than those for H , particularly for k lower than 4. This leads to the expectation of more dominance relations in the case of M_0 (Figure 5.25) than in the case H (Figure 5.26).

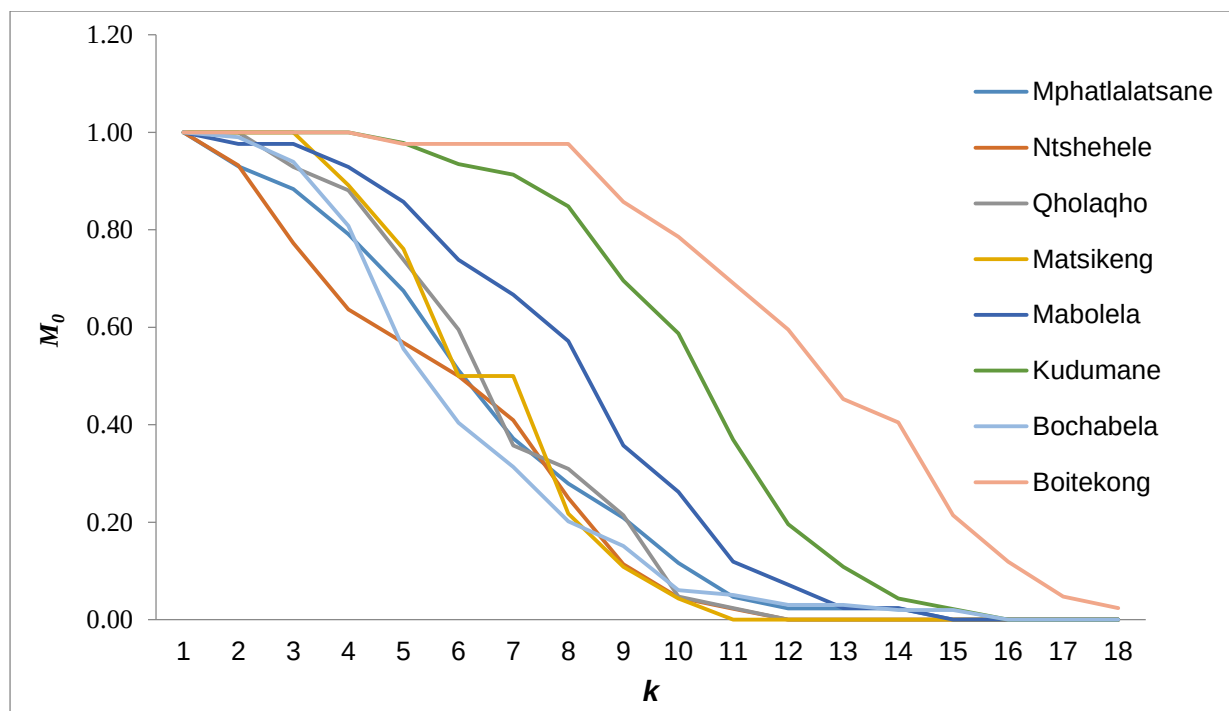


Figure 5.26: Poverty comparisons for eight villages in Qwaqwa as k is varied: comparison in multidimensional H

Source: Survey data (2015)

In the case of the multidimensional headcount ratio H , Boitekong and Kudumane are dominated by all villages, except Boitekong in the case of Kudumane. This result confirms that both villages are the worst in term of poverty and well-being. From $k=4$ to $k=13$, Figure 5.26 indicates that Maboela is dominated by Bochabela, Matsikeng, Mphatlalatsane, Ntshehele and Qholaqho. From $k=5$ to $k=11$, Mphatlalatsane is dominated by Bochabela. Even though a higher level of deprivation has been found in Qwaqwa compared to the national figures, the Qwaqwa villages have disparities in terms of poverty and well-being that should be taken into consideration by policy-makers. It is crucial to comprehend the sensitivity of the measure corresponding to the parameters selected, given the importance of the measure as a basic tool used by policy-makers.

5.4 WEIGHTING AND WEIGHTED ESTIMATES OF MULTIDIMENSIONAL POVERTY

The Alkire and Foster methodology is flexible in allocating different weights to various dimensions, subject to their importance. For instance, if policy-makers would like to pay more attention to the health and education dimensions, they can assign greater weights to these dimensions. In the preceding sections (5.3), the analysis of multidimensional poverty in Qwaqwa was weighted equally among all dimensions. In multidimensional poverty, the allocation of weights to different dimensions is inherently a delicate matter, given that it requires value judgement. Instead of an arbitrary choice of weights, the capability approach suggests that the allocation of weights to different dimensions should be based on public debates and democratic procedures (Sen, 2004:77), or through different approaches for setting weights in multidimensional indices (Decancq & Lugo, 2008). There is no universally accepted theoretical framework for how to set weights. As a result, the researcher can rely on common sense and be cautious in interpreting the obtained ordering of well-being bundles (Decancq & Lugo, 2008:23).

To elaborate the flexible feature of the Alkire and Foster method in setting different weights to various dimensions, revised weighted estimates of multidimensional poverty in Qwaqwa are provided in this section. Double weights are allocated to three dimensions, income, education and health compared with the rest of the selected dimensions. Setting double weights to three dimensions yields the weight structure displayed in Table 5.8.

Table 5.8: Weights for each dimension

Dimensions	Indicator	Weight for each indicator
Clothing and housing conditions (1.8)	Adequate floors	0.36
	Adequate external walls	0.36
	Adequate roof material	0.36
	No critical overcrowding	0.36
	Clothing	0.36
Air quality (1.8)	Fuel for lighting	0.6
	Fuel for cooking	0.6
	Fuel for heating	0.6
Assets (1.8)	TV/radio (information and entertainment: access to media)	0.6
	Cell phone/landline telephone (communication and access to media)	0.6
	Other assets	0.6
Water and sanitation (1.8)	Access to water source	0.9
	Adequate elimination of sewage waste	0.9
Health (3.6)	Proximity of health facilities	1.8
	Food security	1.8
Household education conditions (3.6)	Educational achievement	1.8
	Literacy	1.8
Household expenditure (3.6)	Household expenditure	3.6

Source: Own calculations

5.4.1 Weighted estimates of multidimensional poverty at aggregate level

Although these weights are intended exclusively for illustration purposes, the three double weighted dimensions were chosen, not only because they are elements of HDI, but also because they correspond to the first six MDGs. The weighted estimates of multidimensional poverty H and M_0 are given in Table 5.9.

Table 5.9: Weighted estimates of multidimensional poverty at aggregate level

K	H	M0	A
0.36	1.000	0.440	0.440
1	0.993	0.440	0.443
2	0.973	0.438	0.451
3	0.923	0.432	0.468
4	0.861	0.419	0.487
5	0.792	0.402	0.508
6	0.696	0.374	0.538
7	0.557	0.325	0.583
8	0.468	0.288	0.615
9	0.366	0.239	0.653
10	0.275	0.191	0.694
11	0.200	0.148	0.737
12	0.134	0.106	0.790
13	0.092	0.077	0.839
14	0.067	0.058	0.874
15	0.054	0.048	0.890
16	0.022	0.021	0.934
17	0.007	0.007	0.971
18	0.002	0.002	1.000

Source: Survey data (2015)

Table 5.9 shows that at $k=6$, 69.6% of households are deprived and, on average, they are deprived in that 53.8% of all indicators fall below the poverty line, with M_0 being 0.37. When these estimates are compared with the results of equally weighted estimates, it is seen that poverty is worse when education, health and income are made to be more important than the remaining dimensions. This is because a relatively greater percentage of households are deprived in three dimensions, which are given double weights, compared to those in other dimensions. In comparing the estimates of multidimensional poverty, when different weights are used and income poverty, one would draw a similar conclusion, as in the case of equal weight. Income measure provides very conservative estimates of poverty (40%), compared to the multidimensional poverty measure (69.6%). Therefore income provides errors of declaring multidimensionally poor households as non-poor and multidimensionally

non-poor as poor. In Figure 5.27, the contribution of each dimensions provided with different weights is illustrated.

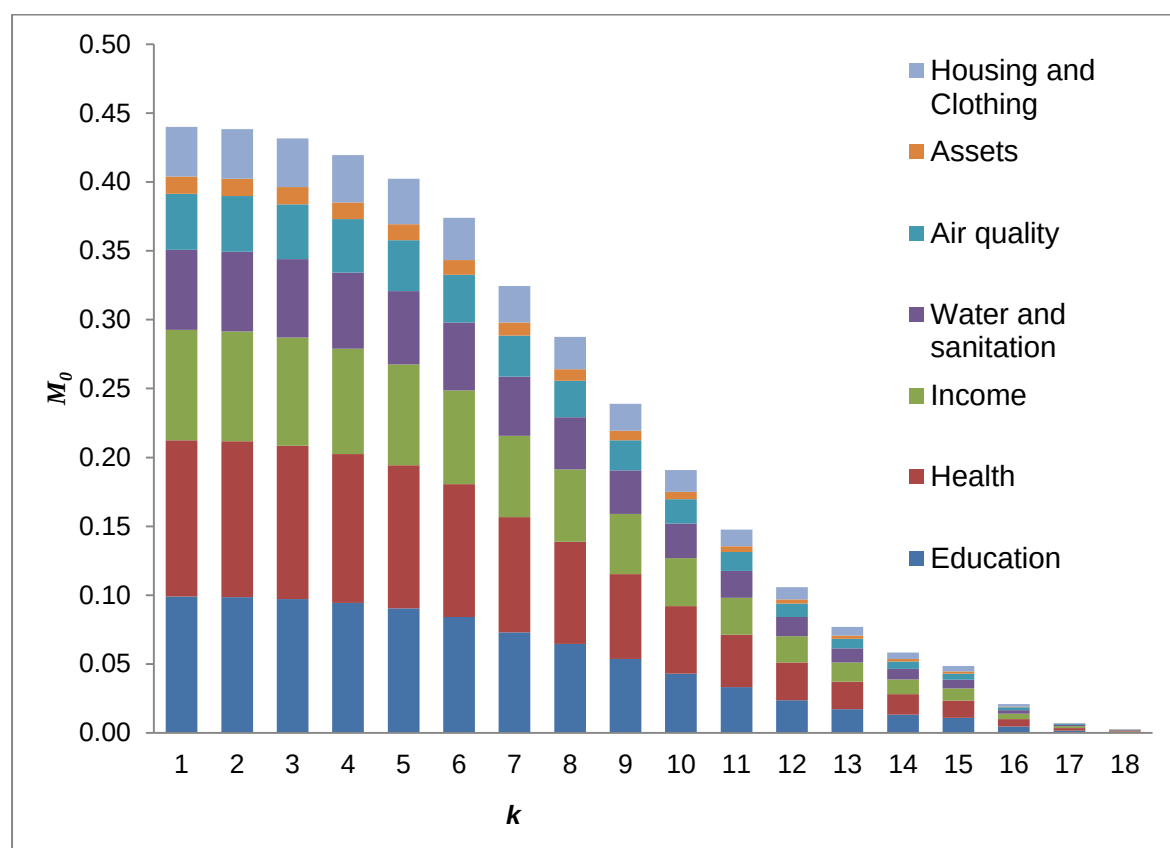


Figure 5.27: Multidimensional adjusted headcount ratio (M_0) in Qwaqwa: contributions by each dimension: different weights.

Source: Survey data (2015)

In Figure 5.27 it can be seen that the ranking is similar for all values of k . The deprivation in health hold the highest share of the intensity of poverty, followed by education, income, water and sanitation, air quality, housing and clothing and assets. Even though income is among the three dimensions that had the double weighting, it has never become the highest contributor to the intensity of poverty for all values of k . This is because there are high levels of deprivation in the other dimensions, compared to income deprivation, regardless of having double weights. Therefore a multidimensional analysis of poverty is crucial, as a policy aimed at the income poor could not benefit other portions of the population, deprived in other dimensions.

5.4.2 Weighted estimates of multidimensional poverty at village level

Table 5.10 presents the weighted estimates of poverty at village level.

Table 5.10: Weighted estimates of poverty at village level

Village	Income H	Different weight Multi. H k=6	Different weight M0 (K=6)	Equally weight Multi. H k=6	Equally weight M0 (K=6)
Kudumane	0.76 (1)	0.93 (2)	0.56 (2)	0.93(2)	0.55(2)
Boitekong	0.67(2)	1.00 (1)	0.73 (1)	0.98(1)	0.69(1)
Mphatlalatsane	0.58(3)	0.70 (5)	0.34 (5)	0.51(5)	0.25(5)
Mabolela	0.40(4)	0.79 (3)	0.41 (3)	0.74(3)	0.38(3)
Ntshehele	0.34(5)	0.57 (7)	0.26 (7)	0.50(7)	0.23(7)
Qholaqhoe	0.31(6)	0.60 (6)	0.29 (6)	0.60(4)	0.27(4)
Bochabela	0.24(7)	0.51 (8)	0.24 (8)	0.40(8)	0.19(8)
Matsikeng	0.11(8)	0.72 (4)	0.34 (4)	0.50(6)	0.23(6)

Source: Survey data (2015)

At village level, Boitekong, Kudumane and Mabolela were found to have the highest headcount and intensity of poverty, either in equal weights or different weights of dimensions. Bochabela continues to be the lowest contributor to the intensity of poverty in Qwaqwa. The multidimensional poverty ranking using different weights differs from the ranking when equally weights are used in the remaining villages. This is critically seen in the case of Matsikeng village, which moved from the sixth place (equal weighting) to fourth place (different weighting). Qholaqhoe village moved from fourth place in equal weighting to sixth place in different weighting. Figure 5.28 provides some of the explanations of these changes.

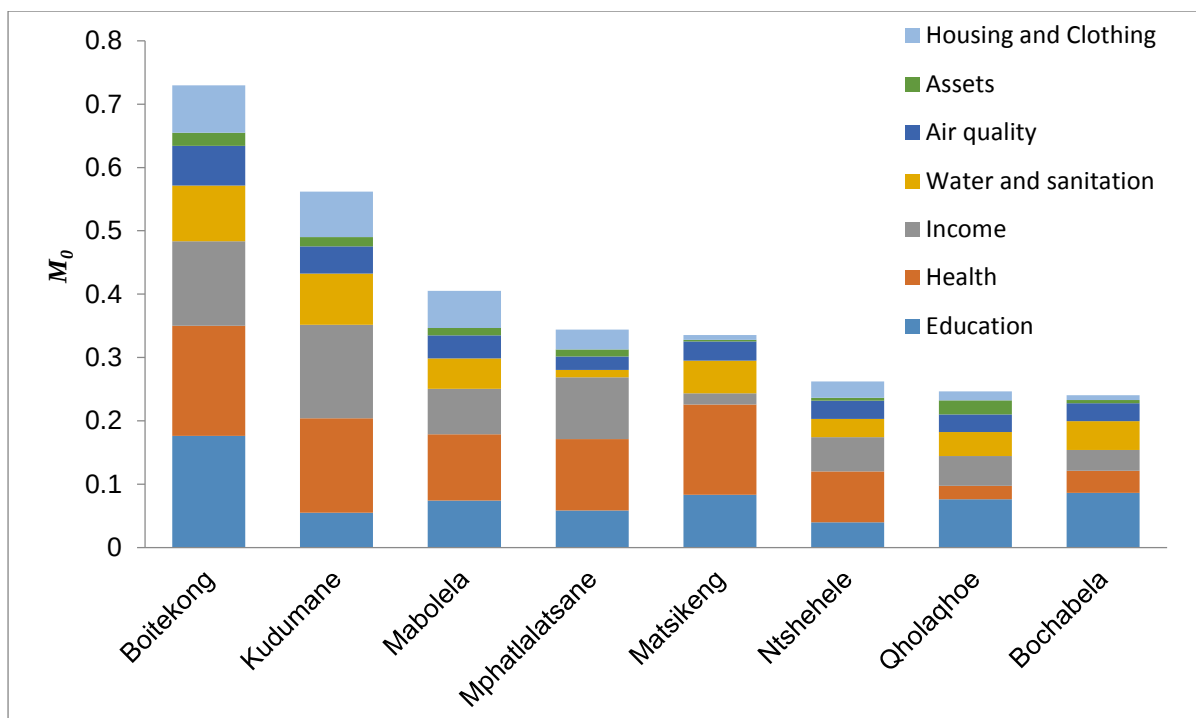


Figure 5.28: Composition of the adjusted headcount ratio (M_0) in each village of Qwaqwa: different weights

Source: Survey data (2015)

In the case of Matsikeng, health was found to be the highest contributor to M_0 , when all dimensions were given equal importance. It is the same village that appears to have the highest deprivation in terms of health. Therefore it is expected to have a higher contribution to the intensity of poverty when it is considered to be more important. Qholaqhoe is the village in which health is found to be the lowest contributor to the intensity of poverty among other villages. Moving from equal weight to double weight given to health, education and income, might reduce the contribution of health to the intensity of poverty in the area. This sort of study can help allocate priorities to public budget distribution among areas.

5.5 SUMMARY AND CONCLUSION

Poverty has numerous dimensions that shape people's well-being. Several countries in the developing world, including South Africa, have started to move away from sole reliance on unidimensional measures of poverty, based on income or consumption,

and have started complementing these income-based measures with multidimensional indicators that also capture households' achievements in areas related to non-tradable goods. Seven dimensions of deprivation that were constructed, based on 18 indicators, were identified. These dimensions include education (educational achievement and literacy), housing and clothing (floor material, walls material, roof material and condition, rooms and clothing), water and sanitation (sources of water and sanitation type), assets (TV or radio, cell phone or landline telephone and other assets), air quality (fuel for lighting, cooking and heating), income and health (proximity of health facilities and food security). The indicators and their cut-offs used in the current study have followed the definition of StatsSA, MDGs definition and other studies mostly conducted in the South Africa context. Access to the selected dimensions has an effect on the well-being of the population in the former homeland of Qwaqwa that differ from merely not having income.

At $k=33\%$ (a cut-off that is mostly used in Alkire and Foster poverty measures), approximately 61% of the households are deprived in 53.4% of total dimensions with an intensity of poverty $M_0=0.326$. At the same threshold, health is the highest contributor to the breadth of poverty in Qwaqwa, followed by water and sanitation, education, income, housing and clothing, air quality and assets. Considering the use of various cut-offs to check the contribution of these seven dimensions, generally it is either health or water and sanitation deprivations that contribute most to the intensity of poverty in Qwaqwa.

In the past, the emphasis on income poverty alleviation was constructed on the absolute assumption that monetary poverty measures effectively detect who is poor. Based on the Spearman correlation coefficients between deprivations, the study found that deprivation in one dimension does not satisfactorily justify the deprivation in any other dimension, as some deprivations were not correlated. For those variables that are correlated with income deprivation, their coefficients are not the highest (never exceed 0.309). This puts emphasis on the arguments that this study is built upon, that deprivation in one dimension does not satisfactorily justify the deprivation in any other dimensions. Therefore poverty needs to be analysed

according to the multidimensional approach for a meaningful investigation and the formulation of policies for its alleviation. This proposes that a multidimensional analysis of poverty is important as a policy aimed at the income poor could not benefit other portions of the population deprived in other dimensions. A further analysis of the relationship between income and other selected deprivation criteria showed an absence of overlap between income and multidimensional poverty. The main difference between the income measure and the multidimensional measure was shown by very conservative estimates of income poverty, compared to multidimensional poverty. A certain number of the households identified as non-poor by income were discovered to have 11 and 12 deprivations out of a total of 18 dimensions. Therefore income does not succeed in correctly detecting households suffering multiple deprivations.

Within Qwaqwa, eight villages were analysed individually, based on the decomposability property of Alkire and Foster's poverty measures. It is then appropriate to apply better poverty-decreasing policies by focusing on the types of deprivations shaping every single subgroup. The villages were ranked according to income headcount ratio H and multidimensional H and M_0 . The village having the highest estimates of Income H was not the one having the highest estimates of multidimensional H and M_0 . Similarly, the village with the lowest estimates of income H was not the one having the lowest estimates of multidimensional H and M_0 . This was due to the presence of high levels of deprivation in the other dimensions compared to the income deprivation. At $k=33\%$, the composition of the adjusted headcount ratio, or simply intensity of poverty, showed that Kudumane and Boitekong are the most deprived villages, while Bochabela was the least deprived village. Even though this was found at $k=33\%$, the robustness of village rankings to changes in the poverty cut-off k confirmed that Kudumane and Boitekong are dominated by other villages, both in poverty headcount ratio and intensity of poverty.

In a further decomposition of poverty, the relationship between multidimensional poverty and household was examined. The poverty level was positively and consistently related to the size of the household. In other words, an increase in household size renders the household more vulnerable to multidimensional poverty

as demonstrated by the high poverty level corresponding to the large household size. With the specified dimension, housing and clothing, water and sanitation, education, health and income, the results revealed that housing, health and income poverty dimensions relatively increase more with the increase in household size, in contrast to the rest of the categories. The rest of the dimensions reveal the prior expectation, as they are not greatly associated with the household size.

Although the ultimate aim is to eliminate poverty, not just to decrease inequality across the poor, the consideration of inequality is important, since the average intensity is not able to show how wide different levels of inequality across the poor can be. Therefore the depth and inequality among the poor was examined in the present study based on adjusted poverty gap M_1 and squared poverty gap M_2 . The depth of poverty is defined as the weighted average of dimension-specific poverty gaps, while the average severity is expressed by S . The average gap $G=0.547$ was found at $k=33\%$. Such an average gap indicates that the average achievement of a poor person in a deprived state is 45.3% of the respective cut-off and it is a considerably large gap. The severity $S=0.394$ is also large, meaning that there is inequality among the deprived states of the poor.

For a more meaningful analysis, the study analysed M_1 and M_2 on village level at $k=33\%$. The villages with the highest M_0 and M_1 have also the highest estimates of M_2 . This means that, in those villages, the multidimensionally poor households are far from ceasing to be so (shown by M_1) and they are accompanied by high inequality. Boitekong village had the highest estimates of the adjusted multidimensional measures ($M_0=0.69$, $M_1=0.377$, $M_2=0.273$), followed by Kudumane (0.551, 0.292, 0.2, respectively) and Maboela (0.383, 0.146, 0.104, respectively). This similar pattern was also found when the robustness of village rankings to changes in the poverty cut-off k , where the same three villages were dominated by the five remaining villages.

The present study has provided an analysis and insights based on the broader perspective of multidimensional poverty as a necessary shift from the traditional unidimensional perspective of poverty, which basically centres on income. The study

has provided a methodology which not only brings out meaningful results, but also can also potentially provide useful tools for budget allocation among the villages of Qwaqwa and within themselves, by applying, among other things, the use of different dimensions. The property of Alkire and Foster's (2011b) decomposable measure, as captured by M_0 in population subgroups necessitates the breaking down of the measure further into dimensions, provides an important element in utilising such a dimensional resource allocation basis. The dimensions used in the study are not exhaustive and other dimensions could be incorporated, subsequently leading to alternative deprivation cut-off values for analysis. The case of Qwaqwa demonstrates a classical example of the need of clearly specifying and setting area developmental goals, on the basis of a holistic understanding of the households' challenges, and, in this case, poverty status and levels, if meaningful development is to be achieved. Such an in-depth understanding in setting developmental goals can be enriched from the proposed methodology of the study and can be used as a progress monitoring instrument. In general terms, the former homeland is more deprived than the whole of South Africa in almost all dimensions, regularly and by a wide margin. This provides a strong reason to focus deprivation-reducing efforts on the area.

CHAPTER 6: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The main objective of the study was to conduct a multidimensional analysis of poverty in the former South African homeland of Qwaqwa. The study sought to determine the various dimensions in which residents of the area are deprived. This objective was to be achieved through a number of theoretical and empirical objectives. The theoretical objectives of the study were related to poverty theories, which included the unidimensional and multidimensional approaches, as well as previous studies in South Africa, with special attention to Qwaqwa, from which the study's data was collected.

Empirically, the study determined various deprivations and their levels, as defined by union, intersection and dual cut-off method of identification. The study aimed at analysing the poverty dimensions through a breakdown of their intensity, thus establishing their specific contributions to poverty. By using the aggregate measures of Alkire and Foster in Qwaqwa, the study estimated the change in level of deprivation by establishing the depth and level of inequality among the poor. It went further, to do poverty decomposition using sub-groups within the area i.e. villages and household characteristics. The final empirical objective was to check the robustness of village ranking, according to the cut-off variations.

The research has, explored multidimensional poverty, focusing on the former homeland of Qwaqwa using the Alkire and Foster family of poverty measures. These measures shift attention from solely income alone to include other intrinsically important dimensions. To measure these, the multidimensional approach makes the best use of indicators of *functionings* available. When this has not been possible, the Alkire and Foster measures include indicators of means closely linked to essential *functionings*. By using survey data, Alkire and Foster's measures identify people with coupled disadvantages and dimensions that hold the highest share of poverty. To stress the usefulness of the multidimensional approach, the results of a multidimensional analysis of Qwaqwa were compared to income poverty in the area.

This analysis is particularly relevant to South Africa's bold adoption of the poverty-related MDGs, keeping in mind the spatial legacy of apartheid. The formulation of effective interventions to combat poverty requires a clear grasp of its manifestations in a particular area. This final chapter of the study begins with a summary of theoretical foundations of the study. It concludes with questions raised by the study, implications for policy and suggestions for future research.

6.2 THEORETICAL FOUNDATION OF THE STUDY

The theoretical objectives of the study were based on the discussion of some approaches to the definition and measurement of poverty, in general, and with further analysis on multidimensional poverty measures. In analysing the concept of poverty, the study considered the traditional monetary approach and the more broad-based multidimensional approaches towards poverty analysis. These were considered to provide an understanding of, and necessitate, an investigation into their historical developments and contexts. In other words, they provided an historical overview of poverty research, an important dimension in the current study.

The study has demonstrated that, poverty is a much-contested concept and its definitions are debatable. While there is unanimous agreement on the eradication poverty as the main challenge of the international community, the meaning in conceptual terms of poverty, how to measure it and to monitor progress for its reduction remain uncertain. A more crucial concern is whether income deprivation is the most appropriate benchmark to measure poverty or should income deprivation be supplemented by other indicators. The widespread agreement is that poverty is a multidimensional phenomenon, rather than income-consumption which has been extensively studied in the past. Human deprivation is analysed in terms of shortfalls from the minimum levels of basic needs themselves, rather than income as an intermediary of basic needs when poverty is viewed in a multidimensional perspective. In this sense, poverty is understood not only as a shortfall in income, but more largely as deprivation in numerous life domains, including financial requirements, basic needs, housing conditions, durables, health, social contacts, participation and life satisfaction.

In general, any definition of poverty contains a certain level of welfare below which an individual must fall to be considered as poor. In other words, poverty is pronounced deprivation in well-being. There are numerous contesting approaches to poverty and welfare definition and assessments, but the most important are the welfarist and non-welfarist approaches. Welfarists stress both the existence of market imperfections and incompleteness and the lack of perfect correlation between relevant dimensions of well-being, which directs attention towards a single indicator, such as income, rather unsatisfactorily. Non-welfarists emphasise the necessity of directing emphasis away from the narrower space of utilities, to a wider space, where multiple dimensions are both instrumentally and intrinsically important. Several non-welfarist approaches have consistently contested the prevalent paradigm (welfarist) approach. The well-known non-welfarist approaches, discussed in the study were the basic needs approach and Sen's capability approach. The former stresses consumption, whereas the latter emphasises individual's values and choices. As a result, the non-welfarist approaches lead to distinct anti-poverty policies.

On the measurement of poverty, the study highlighted that, despite different approaches in defining poverty, there are two distinct approaches for measuring its indicators, namely unidimensional indicators, represented by income/consumption, and multidimensional indicators, with dimensions such as living standards, health conditions and education. For a long time, policy-makers worldwide have embraced a unidimensional perspective of poverty, where poverty is defined on a single monetary indicator for standards of living. The assumption was that the level of income or its proxy consumption could decide accurately if individuals are able to achieve certain minimum thresholds on various dimensions such as nutrition, clothing and housing.

Some of the most important contributions of unidimensional measures are the FGT measures and the Sen Index. The FGT poverty measurements are a family of three indices, namely headcount index, poverty gap index and squared poverty gap. The headcount index (P_0), or incidence of poverty, identifies the proportion of population whose income is lower than the poverty line. The poverty gap index measures the

amount of income by which each person falls below the poverty line, while squared poverty gap describes the severity of poverty. The Sen Index is an index that sought to combine the effects of the number of the poor, the depth of their poverty and the distribution of poverty within the group. The fundamental and severe limitation of income/consumption-based measures is how they assign weights of zero to the potential dimensions of poverty and one weight to a single dimension (income/consumption). Income is merely a means to ends. The ends are therefore more valuable rather than the means. It is expected that a person with a reasonable consumption budget or higher income may be able to enhance the position of a number of his/her monetary and non-monetary attributes. However, some indispensable needs may not be satisfied, because the markets might not exist

With all the limitations to the unidimensional measure of poverty, the multidimensional analysis of poverty established a clear breakthrough in treating the traditional concept of poverty. Less agreement exists, however, about how information indicating the different aspects of poverty should be aggregated to produce a global measure of poverty, and whether the measure should focus on the state of those who are poor, according to all dimensions simultaneously, or according to a shortfall in only one dimension. Numerous methodologies for multidimensional poverty measurement have been suggested, including a fuzzy set approach, which considers state of deprivation; a distance function approach, which considers relevant dimensions into an index; an information theory approach, which considers data compression and its ultimate transition rate; and axiomatic derivations of multi-dimensional poverty indices, which set out axioms against which poverty index is measured. The Alkire and Foster methodology was discussed as one of the axiomatic approaches to the measurement of poverty.

The Alkire and Foster methodology follows two basic standard conceptual framework steps for poverty measurement, namely, identification and aggregation. The identification of the poor is based on counting the number of (weighted) deprivations and identifying poor using a 'dual cut-off' method, where there is a specific poverty line for each indicator, in order to identify the individuals deprived in that particular dimension. To identify who is multidimensionally poor, Alkire and Foster suggested

selecting the second cut-off to be any value between one (the union approach) and the maximum number of dimensions (the intersection approach). The aggregation method extends the existing unidimensional FGT family of measures towards the multidimensional context. The adjusted FGT family of measures is made up of the adjusted headcount ratio, adjusted poverty gap and the adjusted squared poverty gap. The adjusted head count indicates not only the incidence (headcount ratio) but also the intensity of poverty, while the adjusted poverty gap indicates the incidence, breadth and depth of poverty. These provided the basis for analysing the depth and intensity of poverty in Qwaqwa, including the subgroup decomposability and poverty dimensional breakdown.

Poverty has remained topical in international development policy efforts, particularly in the developing world. It is much more topical in the South African context, due the legacy left by the apartheid system. One of features of this system was a procedure of active dispossession, whereby assets, such as livestock and land, were confiscated from the majority black people. Poverty conceptualization, definition and measurement in a society appear to be a mirror-image of the standards of that society. The present study, by looking at the South African situation, sought to agree to the concept that poverty should be adapted according to the appropriate context as there is not a common concept that is believed to hold the meaning of poverty for all countries at all times. Apart from the technical concepts and definitions of poverty discussed in the study, it has been important to take into account the way poor South African people themselves perceive poverty. Poverty, like beauty, lies in the eyes of the beholder. In South Africa, the poor characterise poverty as isolation from the community, a lack of security, low wages, a lack of employment opportunities, poor nutrition, poor access to water, having too many children, poor education opportunities and the misuse of resources.

It was reasoned that the investigation of poverty levels among the South African population is not a new exercise. The poverty condition among the South African white population, was described in the First Carnegie Commission Inquiry into Poverty, which investigated the so-called 'Poor White Problem'. The report entitled 'Carnegie Poor White Study', subdivided into a set of five reports, including

economic, psychological, educational, health and sociological reports, was published in 1932. The Commission distinctly recognised the multidimensional nature of poverty, even if it did not compile an index of multidimensional poverty. After 1994, the government invested greatly in poverty data collection and a series of important reports on poverty were commissioned, in which a series of public strategies were reoriented around developmental issues.

The present study has shown that most studies that investigated poverty in South Africa fit into two categories, those which explored poverty in terms of income or expenditure and those which considered the multidimensional nature of poverty and therefore considered different dimensions of deprivation. The poverty rankings by race were totally robust, looking at the 1993 SALDRU survey and 1995 IES. At any poverty dimension and any poverty line, Africans were found to be much poorer than Coloureds, who are very much poorer than Indians/Asians, who are poorer than whites. Female-headed households have a far higher rate of poverty compared to male-headed households, while a higher proportion of the poor population lives in rural areas rather than urban dwellers. The distribution of unemployment indicated that the highest unemployment rate was among the poor, especially poor blacks, followed by Coloureds. In general, from 1993, the income poverty has dropped and a large decrease in overall multidimensional poverty in South Africa has been noted. The problem of high inequality inherited from apartheid has continued to dominate the economic strategic efforts of the post-apartheid government. South Africa's income inequality levels are among the highest in the world, with a Gini coefficient at around 0.70 in 2013. The intra-racial dynamics are influential, where the African group has the highest inequality. This influences the aggregate changes in inequality.

The key determinants of poverty in South African namely unemployment and education were discussed in the study. These have shown to be the basis of causes of poverty and inequality in South Africa. From the poor's own perspective, through the interviews conducted by the South African National Development Agency (NDA), the key determinant of poverty was recorded to be education, which immediately associates with employment status. Many poor people have no physical assets,

neither a small farm nor a small industry. They are the landless or urban poor. The only asset they possess is their own two hands and their willingness to work. In such a situation the best investment is in human resource development. South Africa has one of the highest unemployment rates and one of the lowest labour force participation rates, and exhibits one of the highest income inequalities, in the world. Unequal distribution of education, both in quantity and quality, is perceived as an accelerator, leading to inequality in labour market earnings and as a major factor in the intergenerational transmission of inequality. Education has the potential of being a policy tool that can simultaneously decrease inequality and lift the mean income. It is appropriate that public policy should target the reduction of poverty and inequality, proceeding from the understanding that the reduction of poverty may not necessarily result in the reduction of inequality.

One of the theoretical objectives was to review the literature concerning poverty the former South African 'homelands'. These homelands were established in 195,1 under the Bantu Authorities Act, and were established for black Africans. There were ten homelands that were established, namely Transkei, Bophuthatswana, Ciskei, Venda, Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa and Qwaqwa. In terms of land quality, most homelands were not only geographically fragmented, with poor infrastructure between them, but had poor land quality, not suitable for agriculture, due to its mountainous nature, which was aggravated further by poor rainfall. Most homelands could not offer a variety of employment opportunities, as they contained very few towns and in some cases no cities at all. The social and economic conditions within the black homelands were exceptionally harsh, by any standards. In general, there was poor infrastructure development and welfare services, coupled with high levels of poverty, which meant homelands had s very low standard of living, compared to most parts of South Africa.

Numerous studies of former South African homelands showed that poverty is concentrated in the former homelands. Deprivation rates for the rest of South Africa were found to be significantly lower than the average for the former homelands. On average, the population in the former homelands was more advanced in age, with low education. Most of the households were female-headed. In terms of income,

most homelands' households, on average, had lower income levels, with critical differences, compared to non-homeland households.

6.3 METHODOLOGY

The study conducted a survey with a sample of 404 households, which were randomly selected to meet the analytical needs of the study. The target population were households based in the former homeland of Qwaqwa, in Maluti-A-Phofung Local Municipality of the Thabo Mofutsanyana District Municipality of the Free State province of South Africa. In order to collect the necessary data a survey questionnaire was used. Structured face-to-face interviews with participants in their own households were undertaken by field workers.

Data were collected from February to March 2015, based on the questionnaire, which included various aspects of households' demographic and socioeconomic characteristics, as well as some aspects of well-being. In this regard, the study included household expenditure, health, education, water and sanitation, air quality, assets and housing and clothing as aspects to be used to analyse multidimensional poverty in the area. The selection of these aspects referred to the indicators and their cut-offs defined by StatsSA, MDGs and other studies mostly conducted in the South Africa context.

The identification and aggregation of the poor was conducted using the Alkire and Foster family of measures, while the comparison of multidimensional poverty and income poverty was discussed, based on the Spearman correlation. The population under study were characterised by a low level of education and a high level of unemployment, leading to a very low average income (salary/wage). Almost 75% of the sampled households receive government grants (old age pension, child grant and other grants).

6.4 CONCLUSION

Poverty has numerous dimensions that shape people's well-being. Several countries in the developing world, including South Africa, have started to move away from a

sole reliance on unidimensional measures of poverty based on income/consumption, and have started complementing these income-based measures with multidimensional indicators that also capture households' achievements in areas related to non-tradable goods.

The study's findings are in line with the empirical objectives and have shown that the access to the selected dimensions has an effect on the well-being of the population in the former homeland of Qwaqwa that differ from merely not having income. Seven dimensions of deprivation, that were constructed based on 18 indicators, were identified. These dimensions include education (educational achievement and literacy), housing and clothing (floor material, walls material, roof material and condition, rooms and clothing), water and sanitation (sources of water and sanitation type), assets (TV or radio, cell phone or landline telephone and other assets), air quality (fuel for lighting, cooking and heating), income and health (proximity of health facilities and food security). The indicators and their cut-offs used in the current study have followed the definition by StatsSA and MDGs definition and other studies mostly conducted in South Africa.

Considering the intensity of poverty, the study found that, out of the seven dimensions, it is either health or water and sanitation deprivations that contribute most to the intensity of poverty in Qwaqwa. For example, at $k=33\%$, which is the cut-off used most in Alkire and Foster poverty measures, approximately 61% of the households are deprived in 53.4% of total dimensions, with an intensity of poverty $M_0=0.326$. At the same threshold, and most importantly, health is the highest contributor to the breadth of poverty in Qwaqwa, followed by water and sanitation, education, income, housing and clothing, air quality and assets. Considering the use of various cut-offs to check the contribution of these seven dimensions, generally, it is either health or water and sanitation deprivations that contribute most to the intensity of poverty in Qwaqwa.

The study also established that income does not succeed in correctly detecting households that suffer multiple deprivations. In the past, the emphasis on income poverty alleviation was constructed on the absolute assumption that monetary

poverty measures effectively betray who is poor. Based on the Spearman correlation coefficients between deprivations, the study found that deprivation in one dimension does not necessarily mean the deprivation in any other dimension, as some deprivations were not correlated. Moreover, for those variables that are correlated with income deprivation, their coefficients are not the highest (never exceed 0.309). This emphasises the arguments this study is built upon, that deprivation in one dimension does not satisfactorily justify the deprivation in any other dimensions. Therefore poverty needs to be analysed according to the multidimensional approach for a meaningful investigation and policies for its alleviation. This proposes that a multidimensional analysis of poverty is crucial, as a policy aimed at the income poor could not benefit other portions of the population deprived in other dimensions. A further analysis of the relationship between income and other selected deprivations showed an absence of overlap between income and multidimensional poverty. The main difference between the income measure and the multidimensional measure was shown by very conservative estimates of income poverty, compared to multidimensional poverty. A certain number of the households identified as non-poor by income were discovered to be having 11 and 12 deprivations out of a total of 18 dimensions, thus showing the limitations of the monetary measure of poverty.

In considering the decomposition of poverty analysis, the study used villages and household size as the determining factors. Within Qwaqwa, eight villages were analysed individually, based on the decomposability property of Alkire and Foster poverty measures. It is then appropriate to apply better poverty-decreasing policies, by focusing on the types of deprivations shaping every single subgroup. The villages were ranked according to income headcount ratio (H) and multidimensional H , and adjusted headcount ratio (M_0). The village having the highest estimates of income H was not the one having the highest estimates of multidimensional H and M_0 . Similarly, the village with the lowest estimates of income H was not the one having the lowest estimates of multidimensional H and M_0 . This was due to the presence of high levels of deprivation in the other dimensions, compared to the income deprivation. At the same $k=33\%$ cut-off, the composition of the adjusted headcount ratio or simply intensity of poverty showed that Kudumane and Boitekong are the

most deprived villages, while Bochabela was found to be the least deprived village. This was found at $k=33\%$, but the robustness of village rankings to changes in the poverty cut-off k confirmed that Kudumane and Boitekong are dominated by other villages, both in poverty headcount ratio and intensity of poverty.

In a further decomposition of poverty, the study showed that the poverty level is positively and consistently related to the household size. This was established by examining the relationship between multidimensional poverty and household size. In other words, an increase in household size renders the household more vulnerable to multidimensional poverty, as demonstrated by high poverty levels corresponding to the large household size. With the specified dimension of housing and clothing, water and sanitation, education, health and income, the results have shown that housing, health and income poverty dimensions increase more with the increase in household size in contrast to the rest of the categories. The rest of the dimensions reveal the prior expectation as they are not greatly associated with household size.

The study also empirically aimed at analysing the existing inequalities in the former South African homeland. Although the ultimate aim is to eliminate poverty and not just to decrease inequality among the poor, the consideration of inequality is important, since the average intensity is not able to show how widely different levels of inequality across the poor can be. Therefore the depth of inequality among the poor was examined in the present study, based on the adjusted poverty gap M_1 and squared poverty gap M_2 . The depth of poverty is defined as the weighted average of dimension-specific poverty gaps G , while the average severity is expressed by S . The average gap G was found to be large, while the severity S indicated that there is high inequality among deprived states of the poor.

For a more meaningful analysis, the study analysed M_1 and M_2 on village level at $k=33\%$ to further examine the inequalities as well as the robustness of village rankings when changing the poverty cut-offs. The villages with the highest M_0 and M_1 also have the highest estimates of M_2 . This implies that, in those villages, the multidimensionally poor households are far from ceasing to be so (shown by M_1) and are accompanied by high inequality. Boitekong village has the highest estimates of

M_0 , M_1 and M_2 followed by Kudumane and Mabohele. This similar pattern was also found when the robustness of village rankings to changes in the poverty cut-off k were analysed and the same three villages were dominated by the five remaining villages.

The study has, in general, provided an analysis and insight into the broader perspective of multidimensional poverty as a necessary shift from the traditional unidimensional perspective of poverty, which basically centres on income. The study has further provided a methodology which does not only bring out meaningful results, but can also potentially provide useful tools for budget allocation among the villages of Qwaqwa and within themselves, by applying, among other things, the use of different dimensions. The decomposability property of Alkire and Foster's poverty measure (M_0) that allows the analysis of poverty by population subgroups and dimensions break down for clarifying each dimension contribution to the overall poverty, provides an important element in utilising such a dimensional resource allocation basis. It should also be noted that the dimensions used in the study are not exhaustive. Other dimensions could therefore also be incorporated and subsequently leading to alternative deprivation cut-off values for respective analysis. The case of Qwaqwa demonstrates a classical example of the need to clearly specify the setting area's developmental goals, on the basis of a holistic understanding of the households' challenges and, in this case, poverty status and levels, if meaningful development is to be achieved. Such an in-depth understanding in setting developmental goals can be enriched from the proposed methodology of the study and can also be used as a progress monitoring instrument. In general terms, the former homeland is more deprived than the whole of South Africa in almost all dimensions, regularly by a wide margin. This provides a strong reason to focus deprivation-reducing efforts on the area. The study results point to several policy implications to improve the welfare of the population in a South African former homeland, otherwise history will repeat itself. These will be discussed in the following section.

6.5 POLICY RECOMMENDATIONS

This study focused on multiple dimensions of poverty (the key focus of MDGs) that help people to relate to the other issues in society as a consequence of deprivations in different dimensions of poverty. Whereas income headcount measure do not provide clues to suitable policy, the multidimensional measure shows that the critical fronts are health, followed by water and sanitation, education, income and housing and clothing.

The results of this study call for a number of recommendations. On the basis of evidence established in this study, five areas of policy adaptation are being recommended, namely adoption of Alkire and Foster's methodology in identifying the needs of poor households, the prioritisation of the needs/dimensions, prioritisation of the target area, household targeting as determined by household size, the involvement of the local leaders, as well as a suggested model on identifying needs, both at the macro and micro level.

The Alkire and Foster methodology distinctly identifies the multidimensional poor from the non-poor. There are several advantages in using this methodology, as identified by Alkire and Seth (2009) to estimate the multidimensional poverty and identify the poor households. Firstly the methodology provides a valid treatment when using the ordinal/categorical data, secondly, it treats the dimensions of poverty and deprivation independent of other dimensions, without assuming substitutability across dimensions and thirdly, the methodology is flexible in terms of assigning equal or different weights to other dimensions, according to their relative importance. The Alkire and Foster methodology, by increasing the aggregate cutting off point, becomes a strong tool in isolating the poorest of the poor from just the poor.

6.5.1 Adoption of Alkire and Foster methodology in identifying the needs of poor households

The study recommends that the Alkire and Foster methodology be adopted as a method for identifying poor households for social protection programmes in South Africa. The recommendation is based on the fact that the methodology provides

more information on the dimensions that contribute more to the intensity of poverty. The methodology further allows the analysis of poverty by subgroups, with its decomposability property. Therefore the Alkire and Foster methodology can potentially provide useful tools for budget allocation. In other words, South African programmes, like the RDP, can use this measure in identifying beneficiaries. The measure, at a higher level, is suggested to be adopted for official estimation of poverty in South Africa, considering that poverty, being a multidimensional phenomenon, should also have an equally multidimensional measure for its true representation. The dimension level breakdown of poverty analysis, by using the Alkire and Foster methodology, will assist policy-makers to design proper targeted policies for poverty alleviation on the basis of area and demographic distributions, which, in the long run, can be a basis for wider social protection mechanisms for households across the country. This includes socioeconomic policies that can be implemented by all development actors (Federal, State, NGOs and Development partners) for household needs identification accuracy, in order to reduce the incidence, intensity and severity of multidimensional poverty in South Africa.

6.5.2 The prioritisation of the needs/dimensions

Anti-poverty programmes often seek to improve their impact by targeting households for assistance according to one or more criteria. In South Africa, the criterion for identifying the poor has been the arbitrarily set poverty line (i.e. those who are not able to meet some basic needs, for both food and non-food consumption). Underlying this strategy is a strong emphasis on enhancing the financial capacity of the poor through government grants, and a social investment fund, to facilitate access of the poor to some basic social services. Inherent in the use of such a single criterion for target selection is the likelihood of targeting errors in the drastic differentiation between the poor and the non-poor, in particular between those in similar circumstances but who just happen to lie on opposite sides of a poverty line. Income-based poverty indices from traditional analysis suggest policy recommendations that plead for transfer policies to alleviate poverty in the short term, whilst multidimensional indices can provide information for implementing socioeconomics policies to break poverty reproduction in the long term. This lies in

the fact that people, for instance in South Africa, may be not only relatively income poor, but also more relatively deprived in other multidimensional characteristics of social welfare. The study has identified, from the area of study, that the dimensional deprivations are health, water and sanitation, education, income and housing and clothing, in the order of priority. In other words, implementation of programmes towards poverty alleviation can be structured on a priority basis, using the priority structure. In terms of programmes that address multiple needs, the programme design is still informed by the priority structure in terms of resource allocation.

6.5.3 The prioritisation of the area of the target

The study recommends the use of the Alkire and Foster methodology in identifying the areas or regions for poverty alleviation programmes. The use of a single criterion for target area selection can inherently lead to a higher likelihood of targeting errors in differentiating between the poor and the non-poor areas, in particular between areas whose households have similar circumstances, but who just happen to lie on opposite sides of a poverty line. The two properties in the methodology, namely decomposition and robustness, are key in helping to identify areas or regions for priority targeting. The decomposition property is advantageous property granting the analysis of poverty by subgroups within the population. It is then forthright to apply better poverty-decreasing policies by focusing on the types of deprivations shaping every single subgroup. The second property under the measure is the robustness of area rankings to changes in various poverty cut-offs. In the study, for example, among the eight villages, using the methodology, the villages were ranked accordingly, depending on poverty thresholds. In other words, government should include the methodology in selecting areas or regions for its wider poverty alleviation programmes.

6.5.4 The household targeting as determined by the household sizes

The study has shown that multidimensional poverty is positively related to the household size. In other words, an increase in household size renders the household more vulnerable to multidimensional poverty, as demonstrated by a high poverty

level corresponding to the large household size. The study shows that dimensional poverty relates differently to the household size. With the specified dimensions of housing and clothing, water and sanitation, education, health and income, the results have shown that housing, health and income poverty dimensions relatively increases more with the increase in household size, in contrast to the rest of the categories. Despite the fact that some of the dimensions reveal that they are not greatly associated with household size, the use of the household size provides an important policy basis for household targeting in implementing poverty alleviation strategies.

6.5.5 The involvement of local leaders

The general policy recommendation borders on the role of local leaders in implementing poverty alleviation programmes, as they are critical in providing leadership in the implementation of programmes according to the identified areas. One of the issues the study benefitted from is the role of local leaders in collecting the quality data, as most participants in the study were more co-operative with local leadership involvement. This underscores the need for their involvement in needs or dimension identification, area prioritisation and households targeting. As these are fundamental stages under the methodology, the role of local leaders play a pivotal role in adopting this type of poverty alleviation programme.

6.5.6 The suggested implementation framework

One of the critical elements in the results of the study and the suggested policy considerations is the multidimensional poverty decomposition aspect, which has revealed the different poverty estimates of multidimensional poverty in the former homeland of Qwaqwa as a whole, village level and according to household size. The policy implication of this is that it provides the ample opportunity for targeting specific villages, as well as households with a big size, based on the incidence, intensity, depth and severity of the multidimensional poverty. The study recognises the dimensional prioritisation as being an initial stage towards implementation of poverty strategies towards the implementation of the programmes as suggested in the model presented in Figure 6.1.

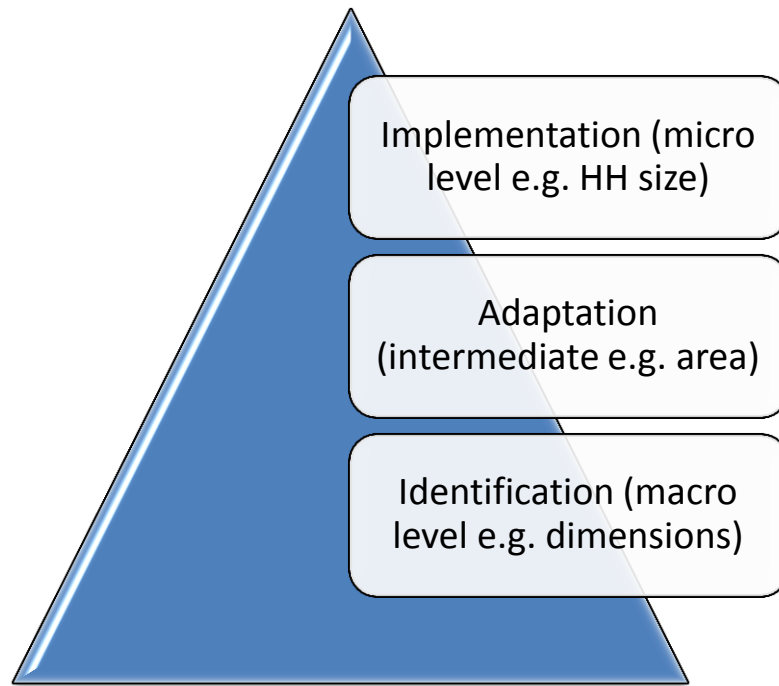


Figure 6.1: Identification Adaptation and Implementation (IAI) Model on poverty strategies

The Identification Adaptation and Implementation (IAI) model in the study suggests a pyramid analysis of poverty strategies, as guided by poverty dimensions and decomposition elements, for example area/villages or household sizes. The model suggests that for poverty policies, the poverty dimensions play an important fundamental role in prioritising the programmes at the macro level, for example where areas are being targetted. In this study, for example, three dimensions could be suggested as being a priority, namely, health, water and sanitation, and education. However, having identified the macro level of intervention, the next step is to adapt the intervention according to areas or villages where by the interventions are adapted according to the villages' needs priorities, as provided by the village rankings. The last stage of implementation is where households size plays a crucial role in targetting houshold level, targetting, in other words, a micro level of poverty implementation.

6.6 LIMITATIONS OF THE STUDY

The general limitation of the study is in the methodology used in assessing depth and inequality among the poor in Qwaqwa. Despite the fact that the inequality-adjusted poverty indices proves useful, the application is more relevant for poverty comparisons across space and time, otherwise the interpretation of the overall index can prove to be cumbersome and not easy to interpret and may easily hinder its policy application. The specific limitation of the study is that some of the dimensions such as health had limited indicators, which were mainly measured by the time to the nearest health facility by the usual means. However, the health dimension may include more, including the health status.

The dimensions used to evaluate poverty were selected mostly based on MDGs. However, the study acknowledges the recent unanimous adoption of Sustainable Development Goals (SDGs) by 193 UN Members in September 2015. The SDGs were not used in the study as they were adopted when the study was being concluded. Based on the 17 goals, the SDGs will lead the development agenda to end poverty by the year 2030. The dimensions of deprivation used by the study also relate well with SDGs, as SDGs offer major improvements on the MDGs (ICSU-ISSC, 2015:7).

6.7 AREAS FOR FURTHER STUDIES

The philosophy behind the capability approach in measuring poverty is that it goes beyond material-based deprivation. There is a need for future studies on multidimensional poverty to include more and more dimensions such as empowerment, safety from hostility and mutually individual associations. This will facilitate experimental investigations of whether or not such dimensions have significance towards multidimensional poverty evaluation. This may also include the addition of more individual level indicators, such as those related to gender and to child poverty, for further analysis.

Despite the fact that there are conceptual, methodological and data collection challenges in moving from the household to the individual when targeting poor

households, men and women experience different sets of deprivations, for instance. Women and children (youth) are typically deprived in empowerment, asset ownership and education dimensions. Merely increasing the material wealth of the households where the women reside, therefore, will not necessarily translate into fewer deprivations for them. As household wealth increases, the bargaining position of these women might even decline, due to changes in relative wealth positions. If the goal of poverty reduction is a serious consideration, then the assumptions of using household aggregates need revisiting, while also attempting to grapple with the complexities of an individual level approach.

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APPENDICES

Appendix I: Spearman correlation coefficients between deprivations

	Education deprived	Literacy	Floor deprived	Walls deprived	Roof deprived	Room deprived	Lighting fuel deprived	Clothing deprived	Telephone deprived	TV/radio deprived	Other assets deprived	Water deprived	Toilet deprived	Cooking fuel deprived	Heating fuel deprived	Health proximity deprived	Food security deprived
Education deprived	1																
Literacy	.432**	1															
Floor deprived	-0.074	-0.015	1														
Walls deprived	-0.08	-0.009	.779**	1													
Roof deprived	-0.048	-0.059	.631**	.679**	1												
Room deprived	-.135**	0.043	.533**	.533**	.419**	1											
Lighting fuel deprived	0.011	-0.006	.132**	0.097	.172**	0.061	1										
Clothing deprived	0.063	0.015	.524**	.478**	.450**	.284**	.206**	1									
Telephone deprived	0.041	0.084	0.077	.100*	.126*	0.069	.206**	.197**	1								
TV/radio deprived	0.067	0.045	.247**	.252**	.278**	.208**	.153**	.176**	.232**	1							
Other assets deprived	0.081	-.108*	.128*	0.072	0.07	0.039	.148**	.197**	0.05	.110*	1						
Water deprived	-0.027	-0.028	.452**	.424**	.406**	.302**	0.034	.297**	0.091	.224**	0.057	1					
Toilet deprived	.215**	.154**	-0.017	-0.013	0.029	-0.031	0.012	-0.028	-0.07	-0.002	.152**	.235**	1				
Cooking fuel deprived	.169**	.208**	.254**	.312**	.308**	.112*	.258**	.243**	.223**	.186**	.136**	.250**	.122*	1			
Heating fuel deprived	.176**	.107*	-0.026	0.002	-0.038	-0.023	0.065	0.043	0.056	.106*	.153**	.176**	.371**	0.016	1		
Health proximity deprived	0.046	0.057	.401**	.389**	.427**	.190**	.106*	.238**	-0.028	.126*	-0.064	.273**	.213**	.183**	0.024	1	
Food security deprived	-0.09	-0.057	.185**	.194**	.205**	.239**	0.069	.202**	0.059	0.092	.163**	0.051	-.148**	0.094	-.156**	.117*	1
Income deprived	-.162**	0.026	.262**	.244**	.218**	.309**	0.086	.262**	.100*	.179**	.107*	.114*	-0.055	.152**	-.111*	0.079	.277**

Appendix II: Questionnaire

Questionnaire #		Date	
Village		Interviewer	

Please note that the Head of the household should preferably answer the questionnaire

A	BACKGROUND INFORMATION					
1	What is the position of the respondent in the Household?	Head(1)	Spouse (2)	Child (3)	Extended family (4)	Boarder (5)
2	Gender of the head of the household	Male(0)			Female (1)	
3	What language do you mostly speak at home?					
	Sesotho	IsiZulu	Sepedi	Tshivenda	IsiNdebele	
	English	IsiXhosa	Siswati	Afrikaans	Other: _____	
4	How long have you (respondent) stayed in the area (years)					_____

B	HOUSEHOLD COMPOSITION									
<i>Please provide the following information about your household</i>										
1	Number of people living in the household	_____								
2	Composition of members (Code list 2)									
3	Age of each member in years									
4	Sex (Male = 0; female = 1)									
5	Marital Status (code list 5)									
6	Highest qualifications (still at school) (Code list 6)									
7	Qualifications (not at school) (Code list 7)									
8	Employment Status (Code list 8)									
9	Sector of employment (Code list 9)									
10	(10–12 for <u>unemployed</u> only) Skills of unemployed (code list 10)									
11	Duration of unemployment in years									
12	What is the Unemployed doing presently									
INCOME (Take home pay per month in Rand)										
13	Wages/salaries (Formal)									
14	Old Age Pension									
15	Child Grant from Government									
16	Other Grants from Government									
17	Help (family/relatives/help in kind)									
18	Informal activities									
19	Other (Specify)									

C HOUSEHOLD EXPENDITURE		
<i>How does your household spend their income per month?</i>		
	ITEM	AMOUNT
1	Housing	
2	Water, electricity, coal, etc	
3	Food	
4	Cleaning material	
5	Cigarettes & tobacco	
6	Beer, wine & spirits	
7	Transport	
8	Clothing	
9	Furniture	
10	School	
11	Entertainment (movies,...)	
12	Medical expenses	
13	Insurance (i.e. funeral scheme)	
14	Gambling	
15	Savings	
16	Licenses (e.g. TV, vehicle)	
17	Housekeeping services (e.g. garden)	
18	Communication (cell and telephone)	
19	Car repayment	
20	Loan repayments	
21	Other (specify):	
	Total expenses:	

D HOUSING AND CLOTHING				
1	Record one main material used for the floor of the dwelling			
	Tiles	Carpets	Cement	Woods
	Bricks	Mud/ Dirt	Dung	Other (specify): _____
2	Record one main material used for the walls of the dwelling			
	Baked bricks with cement	Cement/Concrete	Stone with cement	Corrugated iron/zinc
	Stone with mud	Unbaked bricks with mud	Straw with mud	Other (specify): _____
3	Record one main material used for the roof of the dwelling and its condition(specify leaking/not leaking)			
	Tile	Corrugated iron/zinc		Asbestos
	Thatching	Plastic/wood		Other (specify): _____
4	How many rooms does the household occupy, including bedrooms and living rooms? (do not count storage rooms, garages, bathrooms, toilets, kitchen or rooms for business)			
5	Over the past year, how often, if ever have you and your family gone without enough decent clothing?			
	Never	Once or twice	Several times	Many times
				Always

E	ASSETS					
1	Does the household own the following livestock?					
	Cow(s)	Sheep(s)		Goat(s)		
	Chicken(s)	No livestock		Other livestock (specify):_____		
2	Record whether the household has the following assets					
		Yes	Non		Yes	Non
	Cellphone			Washing machine		
	Landline telephone			Computer (desktop/laptop)		
	Television			Motorcycle/scooter		
	Radio			Bicycle		
	Refrigerator			Car in working condition		
	Microwave			Own a house/land (other than the one you live in		
	Dishwasher					

F	WATER AND SANITATION			
1	Record the main water source used by the household			
	Piped water inside the house	Piped water inside the yard	Piped water within 200m	Piped water at a distance more than 200m
	Water carrier	Rain water	Spring source/river	Other (specify):_____
2	What main type of toilet is used by the household?			
	Flush toilet	Pit latrine with ventilation	Dry raised latrine or dry pit latrine	
	Pan/bucket	Communal toilet	No toilet	Other (specify):_____
3	Record the means of refusal (solid waste) collection from the household			
	Local authority	private company		Communal dump
	Own dump (i.e backyards of the house, Digging a hole around the house and burn it)			Other (specify):_____

G	AIR QUALITY		
1	Is the household connected to the main source of electricity?		Yes No
2	Record the type of fuel for cooking used by the household		
	Electricity	LPG/natural gas	paraffin
	Coal/Charcoal	Wood/straw/shrubs/grass	Other (specify):_____
3	Record the type of fuel for heating used by the household		
	Electricity	LPG/natural gas	Paraffin
	Coal/Charcoal	Wood	Other (specify):_____

H	HEALTH			
I	How long does it take you to get to the nearest clinic/hospital (using your usual means of transport)?			
	30 minutes or less	More than 30 minutes		
II	Household Food Insecurity Access Scale (HFIAS)			
	<i>(rarely: once or twice; sometimes: 3 to 10 times; Often: more than 10X in the last 4 weeks)</i>			
1	In the past four weeks, did you worry that your household would not have enough food? (if answer is No, skip to Q2)		1: Yes	0: No
1a	How often did this happen?	1: Rarely	2: Sometimes	3: Often
2	In the past four weeks, 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 Q3)		1: Yes	0: No
2a	How often did this happen?	1: Rarely	2: Sometimes	3: Often
3	In the past four weeks, 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 Q4)		1: Yes	0: No
3a	How often did this happen?	1: Rarely	2: Sometimes	3: Often
4	In the past four weeks, 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 Q5)		1: Yes	0: No
4a	How often did this happen?	1: Rarely	2: Sometimes	3: Often
5	In the past four weeks, 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 Q6)		1: Yes	0: No
5a	How often did this happen?	1: Rarely	2: Sometimes	3: Often
6	In the past four weeks, 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 Q7)		1: Yes	0: No
6a	How often did this happen?	1: Rarely	2: Sometimes	3: Often
7	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food? (if answer is No, skip to Q8)		1: Yes	0: No
7a	How often did this happen?	1: Rarely	2: Sometimes	3: Often
8	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food? (if answer is No, skip to Q9)		1: Yes	0: No
8a	How often did this happen?	1: Rarely	2: Sometimes	3: Often
9	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?		1: Yes	0: No
9a	How often did this happen?	1: Rarely	2: Sometimes	3: Often

