THE IMPACT OF GOVERNMENT SUPPORT ON WELFARE OF LOW AND MIDDLE INCOME HOUSEHOLDS IN LIMPOPO PROVINCE

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DECLARATION

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DEDICATION

This dissertation is dedicated to the living memories of my late grandmother Vho-Mukhatshelwa Gadisi and my beloved parents for their greatest contribution towards my life through encouragements, love and financial support.

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Until you reach the impossible through fervent, faith filled prayer, you will never fulfil our created purpose.

David Smithers

ABSTRACT

South Africa is a developing country and a developing household's welfare has become residualised through the restrictions of benefits which have contributed to the increase in poverty with the further elimination and relegation of different income groups. Government support in South Africa has been accepted as a policy option to improve the basic household standard of living. Government support is important for poverty elimination as it ensures a basic minimum standard of living for low and middle income households or households who are considered as poor; and contributes to achieving a more equitable income distribution in society. The study therefore analyses the impact of government support on the welfare of low and middle income households in Limpopo province. The dataset used for the study was obtained from an income and expenditure survey data conducted in 2010/2011. A sample size of 3306 households from Limpopo province was used for the study.

The results show that socio-economic factors, such as age, gender, household size, educational level, employment and salary (income), together with households assets, such as television, DVD player, motorcycle, motor vehicle, washing machine, value of house, own production (inpr) and government support services such as RDP support, subsidised house, medication and social welfare (grant), are the most important features considered in household welfare. The empirical results show that low and middle income households in general are most likely to have low standards of living (welfare) due to low levels of education, large household size, and lack of employment. In addition, low income households with low levels of education are all found to be systematically associated with a low standard of living. Low income households headed by males have low welfare levels, compared to males in middle income households. The results further suggest that ownership of assets such as televisions, motor vehicles and motor cycles, have significantly negative impacts on the welfare of households in lower and middle income category. The negative impacts of these assets might be as a result of the cost associated with subscription, maintenance, fuel and other costs incurred to maintain these assets. Households that have their own production in a form of subsistence farming have improved welfare, relative to those who do not have any food production sources. Therefore, in order to improve the welfare of low income households, there is the need to encourage people to engage in subsistence farming or to have their own food production source. Concerning government support variables, results show that low and middle income households, which receive government support of free houses, subsidised houses, medication and social welfare

(grants), gain welfare improvements, relative to those who did not have access to such support services.

The empirical results from propensity score matching were employed to analyse the impact of real impact on various government support services for low and middle income household. The empirical finding from the average treatment on the treated (ATT) from Propensity Score Matching estimations, using nearest neighbor and Kernel-based matching algorithms, showed that the adoption of government support services exerted greater positive impact of change in the welfare of low income category households. The results generally reveal both positive and negative impacts of the various government support services on the welfare of middle income households in the study area. Different specific policy interventions are required to promote government support for change in welfare for the low and middle income categories in Limpopo province.

Keywords: Impact, government support, household welfare, propensity score matching and compensation variation.

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LIST OF ACRONYMS

NNM	Nearest neighbor matching
KBM	Kernel-Based matching
ATT	Average treatment effect
WWF	World Wide Fund
UN	United Nations
UNICEF	United Nation International Children's emergency Fund
STATS SA	Statistics South Africa
ISSA	International Social Security Association
UNRISD	United Nation Research Institute of Social Development
ILO	International Labour Organization
FAO	Food and Agriculture Organization
IES	Income and Expenditure Survey
RDP	Reconstruction Development Programme
SOAP	State Old Age Pension
DG	Disability Grant
CSG	Child Support Grant
WHO	World Health Organization
CV	Compensation Variation
OECD	Organization for Economic Cooperation Development
LRS	Labour Research Service
MS	Master Sample
EAS	Census Enumeration Areas
PSU	Primary Sampling Unit

CHAPTER ONE: INTRODUCTION

1.1 The background of the study

The global financial crisis in 2008 caused many people to lose their jobs (Heltberg *et al*., 2012). This resulted in a welfare crisis and affected the living standards of people due to increases in food, fuel and other commodity prices. The effect was more pronounced owing to economic, financial and political turmoil around the world (Heltberg *et al.,* 2012). Held *et al.* (2010) argued that these systematic shocks of complexity and scale witnessed in 2008 are quite unprecedented in world history, but predicted that there will be more in the future. The global economic predicament had a large, undesirable impact on the welfare of the population of many African countries, which led to an escalation in the share of population in poverty (Samson *et al.,* 2004). Poor households face protracted impoverishment and pay out a great proportion of their earnings on foodstuffs. Furthermore, they lack access to basic infrastructure and education, and the majority of the people in those households are unemployed.

Both income inequality and welfare have occurred for decades in advanced and emerging economies, and in spite of the various collaborations, the problems still remain difficult. In less-developed economies, welfare has been residualised by restrictions in the benefits given to the poor, thereby contributing to increased poverty rates, and also the elimination and relegation of different income groups (Triegaardt, 2006). Midgley and Kaseke (1996) stated that government support programmes in less developed economies, including South Africa, were heavily influenced by the social security systems in Europe and Britain. Government support, as a policy option, has been widely accepted in developed and emerging economies. Government support is an important policy instrument in poverty elimination because it ensures that low and middle class households have the least onerous standard of living possible and provides a more equitable distribution of income in the economy (Triegaardt, 2005).

In South Africa, the government has adopted a social security system through investment in social wages, which comprise education, health services and social development. The aim of this system was to reduce the cost of living for low and middle income individuals (Triegaardt, 2006). The government also supports vulnerable households through old age grants, child support grants and other forms of social assistance (Van Der Berg, 2009). The World Bank (2001) has categorised South Africa as a higher middle income nation, and has also stated that the dispersal of wealth and income is among the most unequal in the world.

Most South African households experience high vulnerability to poverty and the country is dominated by low and middle income households (Gyekye and Akinboade, 2003).

The government in South Africa classifies households that receive a minimum wage as low and middle income households, and these households face serious health and well-being challenges. Apart from social influences, low and middle income households can only afford food which is extremely deficient in nutrients and this result in high infant mortality rates (Friedman and Bhengu, 2008). The challenge that low and middle income households face in South Africa is that many family units still have low potentials of gaining access to quality education, healthcare, electricity and portable water. These households are under extreme pressure because they cannot attain minimum living standards, measured in income and consumption terms (Gyekye and Akinboade, 2003). Austin *et al.* (2004) have reported that macroeconomic changes have fuelled the attention of welfare interests in low and middle income households, and stated that high rates of unemployment, teenage child bearing and single parent households form part of the simultaneous disadvantages that low and middle income households face.

The South African government in its policies before 1994 promoted widespread dependency on cash income, which caused endemic poverty and racial inequality. The economy of South Africa before 1994 was stagnant due to reduced welfare, declines in agricultural activities, a growing population and 4.8 million unemployed people (Friedman and Bhengu, 2008). However, the official unemployment figures show that the unemployment ratio in South Africa expanded from 22 per cent in 1994 to 25 per cent in 2014, and that employment figures have increased by 6.1 million since 1994, while the unemployment rate increased by 3.4 million, which leaves the percentage growth in the unemployment rate at 73.3 per cent, which is higher than the growth of the employment of 69.2 per cent (Stats SA, 2014).

In 1994, a new democratic dispensation began and the South African government in its development policy initiatives focused on rectifying the socio-economic disparities and racial divisions that existed in the past. After democracy in 1994, the South African monetary policies have been dedicated to improving the livelihoods of the poor, and most of the policies to help the poor have been implemented in the housing, healthcare and social security sub-sectors (Gyekye and Akinboade, 2003). Patel and Wilson (2003) revealed that the democratic government of South Africa further deracialised the structured social security services programmes by means of launching the child sustenance grant, which aimed at improving household welfare for millions of South Africans. In the early 90s, the governing body of the nation invested considerably in the general education system. However, the quality of education in rural and township schools is not improving, which is of great concern

(Bloch, 2006). However, despite all the efforts of the South African government, many households in South Africa still live in poverty (Alesina and La Ferrara, 2002).

Low and middle income households need government support to be able to meet their basic socio-economic needs. Furthermore, these households lack access to year-round food, they skip meals in a day, and the majority of the individuals are unable to access healthcare services. They lack services such as portable water for drinking and sanitation. Low and middle income households in South Africa cannot manage to pay for basic education for some or all of their offspring, and some lack basic living quarters (Sachs, 2005). Moreover, the income of majority of the low and middle income households is low and they can barely meet the basic needs to survive on a daily basis.

The World Bank (2005) has noted that the government of South Africa has developed policies since the new democratic dispensation and these policies have focused on the alleviation of poverty and improving economic growth. The government has implemented social security programmes which will offer income security and safety nets designed for the greater number of low and middle income households. In spite of all these new policies implemented by the government, there is a lack of knowledge on the direct and precise impact of the government policies on the welfare of different income groups (Taylor, 2002). There has been a substantial growth in government support, such as grants, and much has been done to expand access to services for low and middle income households. However, the questions still stand whether the various forms of government support are effective in improving the living standards of low and middle income households, and to what extent these forms of support are impacting on the welfare of people. It is therefore critical to identify the welfare impact of government support on low and middle income households in Limpopo province.

The purpose of this study is to evaluate the impact of basic government support programmes for low and middle income households in Limpopo, such as the basic necessities of water, electricity, education, medical care, the reconstruction and development programme (RDP) and social welfare (grants).

1.2 Problem Statement

Recent studies on government support for the low and middle income groups have focused on social policies and income inequalities (Leubolt, 2014); poverty and households' well-being ten (10) years after the demise of apartheid in South Africa (Bhorat and Kanbur, 2005; Gumede, 2008; Bhorat and Van Der Westhuizen, 2012); and income distribution and the relationship between poverty, inequality and growth (Van Der Berg and Siebrits, 2010;

Leibbrandt *et al.,* 2001; Gyekye and Akinboade, 2003). Some authors have considered the macroeconomic impact of government support and its role on social aid in eradicating poverty and stimulating household improvement, and others have examined the influence of social support on health, education, basic shelter, consumption and unemployment (Samson *et al.,* 2004; Wanka, 2014; Mafiri, 2002).

These studies did not measure the actual impact of government support on the well-being of low and middle income family units. Compared with the available literature, this study seeks to evaluate the impact of government support programmes on the welfare of low and middle income households in Limpopo province. Additionally, the socio-economic characteristics and determinants of low and middle income household welfare are explored. Limpopo is considered one of the most poverty stricken provinces in South Africa, according to Statistics South Africa (Stats SA, 2002). The province has low levels of urbanisation, as 89.3 per cent of the people reside in rural areas (Stats SA, 2006). Furthermore, the province has the highest rate of illiterate people, at about 46 per cent, indicating wide spread unemployment and low income (Wanka, 2014). Botha (2010) stated that the Limpopo province lacks basic services and opportunities for lucrative employment.

Furthermore, identifying the gaps that remain could assist the government in improving policy that would help low and middle income households to improve their standards of living in Limpopo province. In totality, policy options and recommendations will be entertained.

1.3 The objectives of the study

The aim of this study is to assess the impact of government support programmes on low and middle income households in Limpopo.

In order to achieve the main objective, the subsequent specific objectives are to:

1) Analyse the socio-economic characteristics of low and middle income households in Limpopo.

2) Examine the determinants of low and middle income household welfare.

3) Evaluate the magnitude and direction of government support for the welfare of low and middle income households in Limpopo.

1.4 The organisation of the dissertation

The dissertation is divided into five (5) main chapters. The relevant literatures related to the research are reviewed in Chapter Two. In Chapter Three, the description of the study areas,

the sources of data, the sampling procedure, and an explanation of the analytical techniques that were used to address the stated research objectives are presented. In Chapter Four, the results of the study are discussed, and in Chapter Five, the summary, conclusion and policy recommendations of the study are outlined.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This chapter provides the reader with an overview of the relevant literature related to social welfare. The chapter starts with an introduction on government support and welfare, followed by a review of the nature of government support in South Africa. The subsequent discussion presents the concept of social protection and the two common types of social security, i.e. social insurance and social assistance. Empirical literature on the determinants of a household's welfare is discussed. The different approaches for measuring welfare are discussed with their empirical applications. The last section focuses on a discussion of compensation variation approach and its empirical application.

2.1 Government Support and Household Welfare

Governments around the world are in agreement that all citizens have the rights to benefits from government support (UN, 1989). Government support, also known as social service, first emerged in Europe in the 1800s in the form of social insurance and social assistance programmes to provide economic safety nets to citizens during economic hardship, illness and other shocks (Palacios and Sluchynsky, 2006). Midgley (1995) defined the subject of government support as the steps taken in order to achieve social change, developed to support the welfare of the citizens as a whole, in conformity with the dynamics of economic growth. Marques (2003) stated that government support is understood in a broad sense and includes old age pensions, family allowances, child support grants and other forms of support. Government support is important for poverty reduction and ensures a basic standard of living for individuals living under the poverty line. It contributes to achieving a more reasonable income distribution in the society.

Government support is not new as most developed and emerging countries have been using it, with the hope that it will enhance the welfare of the poor, improve equality, and strengthen the social and political stability of their countries (Yamada, 2016). Government support can lead to successful economic reform (Yamada, 2016). Samson *et al*. (2004) stated that government support helps children escape the inter-generation transmission of poverty by helping them grow into adults that are more productive. Therefore, girls in households that receive government support and social welfare assistance have a higher probability of becoming educated, succeeding in their academic activities and having better food security than children in households who do not receive any support from government.

According to Palacios and Sluchynsky (2006), Denmark introduced locally administered means-tested benefits for needy citizens over the age of 60 in 1881. By 1887, almost one in four of the elderly received pensions worth about 20 percent income capital at the time. In 1898, New Zealand introduced cash transfer programmes specifically aimed at elderly people, while Australia introduced their programmes in 1908. Germany introduced pension fund programmes called “Bismarckian” pensions for workers who had reached the age of 65, and they financed this programme with tax money from tobacco. Thailand and Korea introduced their social insurance schemes in 1988 and 1997, respectively (Palacios and Sluchynsky, 2006). In developing countries, the same pattern is now observed. The policy transfer in the area of pensions, influenced by bilateral contacts and international agencies, led to the introduction of mandated contributory schemes of social assistance throughout Latin America, Africa, the Middle East and, most recently, Asia (Palacios and Sluchynsky, 2006).

In Africa, government support and social welfare programmes were originally developed in the 1950s and 1960s as safety nets for white workers (Dixon, 1987). Social security organisations in Africa have reported that remarkable developments have taken place since 1960s when most African countries gained independence (ISSA, 2008). A growing number of African states have included government support and social welfare programmes as key pillars in their national strategies for growth, poverty reduction and sustainable development. Nonetheless, in spite of the remarkable progress made since 1960s, a number of government support and social welfare programmes, such as healthcare, are faced with several setbacks. According to ISSA (2008), government support coverage rates across sub-Saharan Africa averages about 10 per cent of the population, while in the middle income African countries it accounts for about 40 percent to 70 percent

For example, In 2008, Kenya introduced the retirement benefit programme designed to provide all older people with a monthly minimum guaranteed benefit from the age of fifty-five, and this programme equates up to 20 percent of absolute poverty; in addition, a group of households with a common descent “clan system” has operated as a labour union, pooling resources and providing extra support during vulnerable periods (Dixon, 1987). The households excluded from these benefits are left to rely upon traditional safety nets of family aid, mutual support and communal living. This formal system has eroded as countries develop and build-up, while sources of livelihood have diversified (Dixon, 1987). In Ghana, the social security and national insurance trust established a special voluntary scheme for

informal sector workers, which allows for partial drawdown of individual contributions to finance school fees and health insurance to help cope with economic shocks (ISSA, 2008).

Triegaardt (2005) stated that South Africa as a developing country was influenced by the European–British social security system to incorporate many elements of such social security systems in its first years after the democratic dispensation in 1994. The government had to demonstrate its ability to achieve the desired results and manage economic and financial stability at the same time, contributing to social spending on the poor, including low and middle income households. South Africa's welfare policy makes provision for the unexpected circumstances which are possible but cannot be predicted with certainty. This will improve the ability of people to earn income and help individuals who are unable to mobilise resources (Triegaardt, 2005).

Government support has been recognised throughout the developed and emerging economies to promote uniformity and to protect the poor. It also provides people with proper healthcare, education and basic services (Triegaardt, 2006). Taylor (2002) stated that the reality of government support and social welfare in Africa excludes more people than they cover. This is due to the widespread challenges of poverty which weaken the capacity of the government to fund contributions. Understanding the impact of government support on welfare is important. To some extent, households are faced with challenges in relation to issues of government support such as basic needs delivery. The next section seeks to explain the nature of government support in South Africa.

2.2 Nature of Government Support in South Africa

Samson *et al*. (2006) indicated that the past approach of government support in South Africa was based on meeting the requirements of the white minority. In 1928, the Old Age Pension Act was implemented, which explicitly excluded previously marginalised South Africans. The disability grant was enlarged in 1937 for the same racial group. In the late 1930s and 1940s, monetary assistance was extended more broadly to different racial groups. Even by 1987, child support grants to previously marginalised groups remained a small fraction of the size awarded to whites (Samson *et al*., 2006).

After 1994, the South African government had difficulty with the repercussion pressure of globalisation in addition to meeting the challenges of building the nation (Triegaardt, 2009). Padayachee (2005) discussed how the new democratic government was inundated with an insubstantial economic burden with great debt, dwindling economic growth, growing unemployment and poverty rates. However, the government was dedicated to making provision for underprivileged and marginalised individuals through its safety net system of

social contributions. In South Africa, after democracy was adopted, the constitution was formulated to provide safety measures for the people, while the Bill of Rights maintains civil and political rights to social security, education and healthcare, food, water and housing, which are among the social and economic rights protected (Triegaardt, 2009).

The government's socio and economic policies have been implemented and directed towards achieving macro-economic stability and increasing access to basic services, specifically water, electricity, healthcare and social security (Van der berg *et al*., 2005). The ultimate goal of government support and social welfare in South Africa has been to enhance the welfare and quality of life, mainly that of the poor and marginalised people. Triegaardt (2009) stated that many South Africans then were still feeling the consequence of rising unemployment, disproportion and persistent poverty, even fourteen years after the advent of democratic elections.

UNRISD (2010) stated that government support in areas such as health, education, and water could improve individual welfare, increase productivity, and contribute to overall quality of life. UNRISD (2010) further explained that government support, in general, increases the chances that families and individuals can lift themselves out of poverty and live a decent productive life.

2.3 Social Protection

UNRISD (2010) referred to social protection programmes intended to reduce poverty and protect vulnerable households against livelihood risks by promoting the social and economic status of poor households. UNRISD (2010) further explained that in emerging economies, social protection has occurred as a policy background to combat poverty and vulnerability. In that context, social protection assistance has usually been concerned with predictable income deficits and temporary experiences of poverty and inadequate living conditions. In evolving countries, social protection faces long-lasting poverty and insistent deprivation which affect enormous population. Therefore, social protection programmes are growing to include elements of promotion as well as protection, with the purpose of tackling not only sharp declines in income but also insistently low incomes and their structural causes (UNRISD, 2010).

Social protection is often understood to encompass a wide range of private interventions responding to various risks and vulnerability in the society (Chitonge 2012). Adato and Basset (2008) stated that social protection programmes provide individuals, families and communities with cash transfers with the aim of moving them out of low levels of living conditions by building assets, altering social relationships and allowing for secure,

predictable income. Social protection has been extended quickly over the past two decades throughout the emerging countries (FAO, 2015). To date, about 2.1 million people receive a form of social protection in emerging countries. Social protection in recent years has attracted great attention in low income countries, since many low income countries perceived social protection as a luxury that only high income countries could manage to pay for (Chitonge, 2012). In Africa, increasing attention has been placed on social protection since the 1990s and this was further emphasised by the impact of the 2008/2009 financial and economic crisis (Chitonge, 2012). However, for the majority of people in many low income countries, basic social protection remains a pipedream (ILO, 2008).

Most countries cannot afford social protection programmes that might be significant in improving the standard of living for poor households and combating poverty (FAO, 2015). Social protection includes initiatives that provide money or in-kind transfers to deprived households and low income groups and individuals to protect them against increases in food prices and other risks (FAO, 2015). The social protection will help enhance a poor household's status and also contribute to marginalised households, with the overall goal of improving households' standards of living and welfare. Social protection enhances the welfare of the people, as well as their productivity and economic activity, through cash and in-kind transfers. The FAO (2015) has discussed the subject of social protection and how effective the various forms are in reducing poverty and hunger, and stated that a hundred and fifty million people (people living on less than R17.50 per day) had been lifted out of poverty in 2013.

The difficulties facing social protection programmes are compounded by low levels of access to social services such as water, sanitation, and the pervading dominance of HIV and AIDS in some countries, coupled with a lack of interventions for vulnerable groups (Chitonge, 2012). Chitonge (2012) stated that in most countries, social protection covers a small section of the population, and most of these social protection programmes have remained at a pilot stage, reaching only a small portion of the eligible population. Marques (2003) has opined that in practice, social protection should include social insurance programmes that reduce risk and include old age pensions, disability and sickness insurance; and social assistance programmes that deliver money transfers, including subsidised workforce and conditional cash transfer programmes such as social grants. Social protection in South Africa is mainly dedicated to social assistance programmes, while the role of contributory social insurance is much smaller (UNRISD, 2010).

However, government support in South Africa has at least two common forms of social security, namely social insurance and social assistance. It is also necessary to provide a brief discussion on these common forms of social security.

2.3.1 Social insurance

According to Triegaardt (2005), social insurance is provided to protect employees and their dependent relatives through insurance against emergencies which disturb income. For instance, social insurance covers contingencies such as pension and medical benefits for individuals that receive income (Marques, 2003). Social insurance programmes require people to save in a period of prosperity to cover their needs during bad times; these programmes should form the main pillar for sustainable social protection systems (Marques, 2003). Kaseke (2000) discussed the subject of social insurance in low and middle income households in Africa. The author found that many households find it very difficult for workers to contribute to any social insurance programmes, since the contributions take away earnings which could pay for the present needs of the households. In South Africa, social insurance is not accessible to those outside the formal wage economy. Triegaardt (2005) further explained that low and middle income households in South Africa earn too little money to save for social insurance, and these households are not covered by social assistance from government, as they do not qualify for social assistance because they receive income (Triegaardt, 2005).

2.3.2 Social assistance

Triegaardt (2005) discussed social assistance as a programme entirely financed by government revenue which is a state-owned and funded system, also referred to as social grants. Social assistance is provided to individuals in cash to enable them to meet their basic needs (Triegaardt, 2005). Social assistance programmes are responsible for delivering regular income to South Africa's most vulnerable households and comprise one of government's direct resources of fighting poverty (Van Der Berg, 2009). In South Africa, during 2012/13, nearly 16.1 million individuals were recipients of social assistance, compared with 2.5 million in 1998, and most of this increase relates to the increase of the child support grant (Van Der Berg, 2009). More than half of all households benefit from social assistance (Van Der Berg, 2009). Social assistance programmes are funded directly through government revenue, i.e. tax, and contributed R113 billion to the income of low income households in 2013/14, with 22 per cent of households in South Africa receiving social assistance as a source of income (Van Der Berg, 2009).

2.4 Empirical Literature on Factors Influencing Household Welfare

In this section, the literature on factors affecting a household's welfare will be reviewed. Factors, such as poverty, education and unemployment, are the main factors influencing a household's welfare.

2.4.1 Poverty

Wight et al. (2010) referred to poverty as a situation where an individual or group of individuals cannot afford the basic necessities of life. Poverty generally affects the living standards of this individual or group of individuals, thereby reducing their ability to afford food or better housing. Very often, these individuals are unemployed or are employed in low-paying jobs with little or no benefits. Wight et al. (2010) further explained that poverty is flexible because the cost of living changes year-on-year as the costs for rent, acquiring a house, food, clothing and utilities may increase on a yearly basis. The poor often depend on donations from individuals, charitable organisations (like NGOs) and international organisations (like the UN) (Wight *et al*., 2010).

Anigbogu *et al*. (2014) explained that poverty is widespread and a global occurrence that cuts across all countries of the world. They further explained that not even the most technically and economically advanced economy could vainly assert the absence of at least a single dimension of poverty within their economy. However, poverty seems to be a principal essential trait among developing and the less-developed countries. In a recent report, 70 per cent of the developing world's people live in severe poverty (FAO, 2015). The situation is worrisome in sub-Saharan Africa, as the region is characterised as a low-income region with most of the population living below a poverty line of R26.96 per day.

Empirical studies have shown that poverty influences the well-being of low and middle income households. However, most studies have assessed the influence of social assistance on the poverty rate using pre-welfare and post-welfare approaches to compare the poverty rates. Berry and Fording (2007) estimated a rate of poverty using income data that did not comprise welfare benefits to compute the rate of poverty, while taking into account social assistance transfers. Therefore, they compared the pre-welfare and post-welfare rates. Some studies have indicated that government programmes to combat low standards of living decrease the rate of poverty (Danziger *et al.,* 1981; Levy, 1976; Hoagland, 1980). These studies further explained that the assessed decline in poverty changed from a minimal amount of 10 per cent to 78 per cent, depending on the population of interest, the types of transfers accounted for, and the time period surveyed. Other studies, such as that of Murray (1984), examined the total effect of public assistance on poverty by

inspecting the cumulative level of correlation between welfare benefits and the rate of poverty. They observed that an expansion in welfare generosity associated with low standard of living led to a decrease in the poverty rate.

May *et al*. (1995) compared the average accustomed household expenditure measure with minimum income level and poverty line for poor households. They found that about 36.6 per cent of all households in South Africa and 49 per cent of the population are poor. Their findings show that the headcount ratio of individuals living in poverty is high for households, and their results show that larger household tend to be poorer (May *et al*., 1995). Leibbrandt and Woolard (1999), in an attempt to make an inter-provincial comparison, observed that the prevalence of poverty in KwaZulu-Natal was then lower compared with the Free State, Mpumalanga and Northwest. They also explained that the Gauteng and Western Cape provinces had considerably lower poverty rates than all the other provinces, using an income and expenditure survey (IES) to examine the poverty rankings across the nine (9) provinces in South Africa. Limpopo is considered one of the poorest provinces in the country; due to the fact that the region's economic and social development fails to keep up with that of the other provinces in the country. In South Africa, vulnerabilities to natural disasters and economic shocks are linked to poverty. As such, poor households are more vulnerable to negative impacts from both these disasters and shocks, and the increased shock exposure and impacts contribute negatively to these households' welfare.

2.4.2 Education

As the United Nations Research Institute of Social Development (UNRISD, 2010) has explained, it is the responsibility of the government of a country to provide quality education to all children, free of charge at least until secondary level. UNRISD (2010) further explained that, in some countries, and especially in developed nations, public expenditure is mostly utilised for educational provision and financing, and many cases exist in public private partnerships (PPP). However, fees and other charges are still levied, which continue to affect the affordability and accessibility of quality education.

Educational attainment has been increasing across all race groups, particularly for Africans. Globally, there is crucial connection between education and the welfare of a society. That is, secondary and university education increase access to job markets and employment opportunities (Branson *et al*., 2009). However, UNRISD (2010) has argued that the poor are negatively affected by the commercialisation of the educational system, especially with the higher share of poverty in lower income countries such as South Africa. The 1994 post-apartheid government of South Africa inherited an education system which was

characterised by significant inequalities as a result of the highly unequal resources allocation (Keswell and Poswell, 2004).

2.4.3 Unemployment

Unemployment is a serious problem, which every government around the world has to fight. It is seen as a massive waste of the human capital of a nation and it is the cause of poverty and inequality. Unemployment steals the human capital of a nation and creates socio-economic imbalances in the economy (Snower and De La Dehesa, 1997). Some indicators of welfare have their own limitations due to measurement mistakes and their subjectivity (Deaton, 2008). Mafiri (2002) explained that being without a job in South Africa had been increasing in the last decade up to 2002. Meanwhile, the high incidence of unemployment has become a major socio-economic problem in developing countries like South Africa. Babatunde *et al*. (2015) stated that unemployment and welfare remain major issues in South Africa and that South Africa is considered as one of the most unequal countries in the world. Babatunde *et al*. (2015) explained that joblessness is still a major challenge in South Africa, with an unemployment rate of 24.3 per cent and youth unemployment standing at 49 per cent.

Another established result emerging from other researchers is that unemployment greatly affects the welfare of the unemployed in society (Blanchflower and Oswald, 2004; Clark and Oswald, 1996; Frey and Stutzer, 2002). Schwarz (2010) observed the negative influence of high unemployment rates on welfare using cross-national data for Germany. Schwarz (2010) explained that high levels of unemployment rates go together with negative externalities among the employed.

Akerlof *et al*. (1996) and Wyplosz (2001) explained how the relative cost of unemployment versus inflation is of foremost importance for economists and policy makers. To increase a population's welfare, it is important to know which of the two phenomena has the greatest impact on people's lives (Akerlof *et al*., 1996; Wyplosz, 2001). Becchetti *et al*. (2009) supported this finding by specifying that the cost of welfare and unemployment, set against inflation, is greater than one, and is considerably higher in intermediate age cohorts and in low job protection countries. These were observed through looking at the welfare cost of inflation and unemployment through evaluating age and job markets (Becchetti *et al*., 2009).

Oluwajodu *et al*. (2015) stated that unemployment is a socio and economic challenge which includes many other economic externalities. It diminishes economic welfare, decreases output, and erodes human capital. These costs make unemployment one of the main concerns in countries such as South Africa. Malakwane (2012) explained the social and

economic impact in South Africa. However, the findings suggest that there is a linkage between unemployment and various aspects of deficiency, such as in health, education and skills. The study also established that since 1994, despite subsequent developments and adoption of various policies, unemployment had continued to rise.

Other researchers have observed a significant negative effect of graduate unemployment in South Africa and Malaysia, and found that a lack of skills and the difference in expectations from employers and graduates is perceived to be the cause of graduate unemployment (Oluwajodu *et al*., 2015; Naong, 2011; Sha, 2006). Triegaardt (2009) investigated income inequality among households in South Africa between 2001 and 2007 and discovered that the enormous majority of income inequality can be ascribed to unemployment rate. Furthermore, changes in unemployment account for the majority of the changes in inequality over a period of time (Triegaardt, 2009).

2.5 Determinants of Households' Welfare

The aim of this section is to provide a discussion on the factors affecting a household's welfare. The factors are grouped into government support programmes and socio-economic factors. The discussion begins with the determinants of a household's welfare, followed by socio economic factors.

2.5.1 Government support programmes

In this section, literature on the determinants of a household's welfare is reviewed. Government support programmes are needed to determine which factors influence the welfare of households in low and middle income categories. The determinants of a household's welfare include receipt of social grants, and access to water, electricity and the Reconstruction and Development Programme (RDP).

2.5.1.1 Social Grants

National Treasury (2013) has stated that South Africa has one of the largest cash transfer systems in Africa; therefore, social grants are considered an essential tool to alleviate poverty and low standards of living. While comparing some of South Africa's social indicators with those of the poorest countries in the world, South Africa is considered to be an upper-middle income economy, based on the per capita income (Samson *et al*., 2006). Samson *et al.* (2006) stated that South Africa had achieved its fastest increases in economic growth and investment in decades. None-the-less, the official poverty rate was estimated at 50 per cent, and poverty is a measure of inequality in the world.

General tax revenues are the means through which the government of South Africa finances social grant programmes. The South African Social Security Agency is a discrete, nationwide government agency that implements and administers social grants (Samson *et al*., 2006). In 2001, the range of the Child Support Grant was extended to include children below fourteen years, from children below seven years, and the amounts paid have increased significantly (Samson *et al*., 2006). According to Mabugu *et al*. (2015), R158 billion was invested in social grant programmes in 2012, amounting to 9 per cent of the government budget, which is more than what was paid out for basic education. Woolard and Klasen (2010) posit that social grants, unlike conditional cash transfers, are usually not linked to any specific conditions in order for recipients to receive the transfers. They found that social grants provide households with an income transfer and also reduce poverty. The possible explanation is that families that collect social grants might be more capable of enrolling their offspring in school and provide better sustenance for their families than households that do not receive social grants.

Currently in South Africa, there exist five key categories of social welfare (grants). Firstly one is the State Old Age Pension (SOAP), which supports males and females over the age of 60. Secondly is the Disability Grant (DG), which supports adults who suffer ill health. The Child Support Grant (CSG) is the third category, which assists families with youngsters below the age of fourteen (14) and ensures that the primary caregivers of the children living in poverty are able to finance the health and education of their children. The Foster Child Grant is another category which supports families with children in foster-care under the age of 18. The last category is the Care Dependency Grant, which is responsible for additional maintenance for families with offspring, below the age of 18, with infirmities (Samson *et al*., 2006).

Table 2.1 shows the adjustment of grants in 2015 and 2016. Attention is drawn to the two main social grants that alleviate the welfare of households in South Africa – the old age pension grant and the child support grant. The annual increase in the old age grant income was 6.38 per cent, while that for child support was 6.06 per cent. The old age pension grant is one of the fast growing forms of social assistance.

Table 2.1: Adjustment of Social Grant Values from 2015/ 2016

Grant type	April 2015	April 2016	Increase in grant (%)
Old age pension	R1410	R1500	6.38 %
Old age pension (over 65)	R1430	R1520	6.29 %
Child support grant	R330	R350	6.06 %
Foster care grant	R860	R890	3.49 %
Disability grant	R1410	R1500	6.38 %
War veterans grant	R1430	R1520	6.29 %
Care dependency grant	R1410	R1500	6.38 %

Source: National Treasury (2016)

2.5.1.2 Access to Water

Water is a scarce and unevenly distributed national resource, as noted in the National Water Act (NWA, 1998). According to the World Wide Fund (WWF, 2013), the availability of fresh drinking water is one of the main restrictive issues to South Africa development. South Africa is a water-scarce nation, with unevenly distributed rainfall in the landscape (WWF, 2013). Improved water supply and water management boost a country's economic growth and contributes greatly to welfare; therefore, water and water-linked services must be made part of economic development (Newborne, 2004). For instance, Newborne (2004) explained that water issues are an important strategy for reducing poverty and improving individual well-being. The author explained that in developing countries, especially rural areas, water has different aspects for people's lives and their livelihoods.

According to Statistics South Africa (Stats SA, 2015), only 74.9 percent of houses in the Eastern Cape have access to water, although the situation had improved from 2002 when about 56.3 percent of houses had access to fresh water (Stats SA, 2015). Even though households' access to water is improving, about 4.4 percent of households in South Africa still do not have access to fresh water, as a result, they collect water from rivers, streams, stagnant water pools and dams, wells, and springs (Stats SA, 2015). Evidence from the WHO and UNICEF have demonstrated that globally, 83 percent of the population used water from improved sources in 2004, as compared with 78 percent in 1990 (WHO, 2006 and UNICEF, 2006). As observed by UNICEF, out of 83 percent of the population receiving

drinking water, only 44 percent of this population accessed the water through household connections from a piped system (UNICEF, 2006). Population growth has left the majority of populace remaining without access to fresh water, and the majority of these individuals reside in rural areas.

Koolwal and Van De Walle (2010) explained how deprived rural women in the emerging countries spend considerable time collecting water and how they respond to the upgraded water infrastructure. Koolwal and Van De Walle (2010) observed limited access to water as a negative impact in rural areas. Fay *et al*. (2005) observed a significant positive effect of having piped water for children under five years of age. They further explained that improved access to water reduces mortality, especially infant mortality. Mangyo (2008) observed a significant positive effect in China of having access to water in the home on the health of a child, relatively if the mothers are more educated. The quality and coverage of infrastructure services such as water have a major impact on the living standards of low and middle income households – most poor people lack access to clean water. Qadir *et al*. (2006) mentioned that population growth, together with the supply of goods and services that coincide with high levels of living, ought to increase the demand for quality water to be made available for the needs of households and individuals in water-scarce countries. They found that 60 per cent of the worldwide populace might be subjected to water scarcity in the next coming years, due to demographics trends and future growth projections of the population.

2.5.1.3 Access to Electricity

The World Bank (2008) has stated that electricity greatly improves the quality of life, especially for rural households and individuals. It also brings benefits such as increased study time for students, and greater security. In a recent study by Statistics South Africa, it was found that electricity supply had increased to 85.5 percent in 2015, compared to 77.1 per cent in 2002, for households that were connected to the main electricity grid (Stats SA, 2015). In South Africa, significant progress has been made by the national electrification programme to provide electricity to all households.

2.5.1.4 Reconstruction and Development Programme (RDP)

Galtung (1978) indicated that housing is an important basic need where protection, safety, security, comforts and socialisation needs are embraced. A study by Manomano (2013) explored the perceptions of RDP beneficiaries on the extent to which the Reconstruction and Development Programme's housing project meets their housing needs in Eastern Cape Province of South Africa. The study indicated that there were differences of social problems

and that the allocation of these houses was gender biased, as there were more females headed households living in RDP houses than males. According to Statistics South Africa, 14.4 percent of all households in South Africa live in state-subsidised houses (Stats SA, 2015). Figure 2.1 shows the provincial percentage distribution of households in South Africa that receive subsidies from government. In Figure 2.1, the largest household distribution was observed in the Free State with 20 percent, followed by North West with 14, while Western Cape and Limpopo were both at 12.

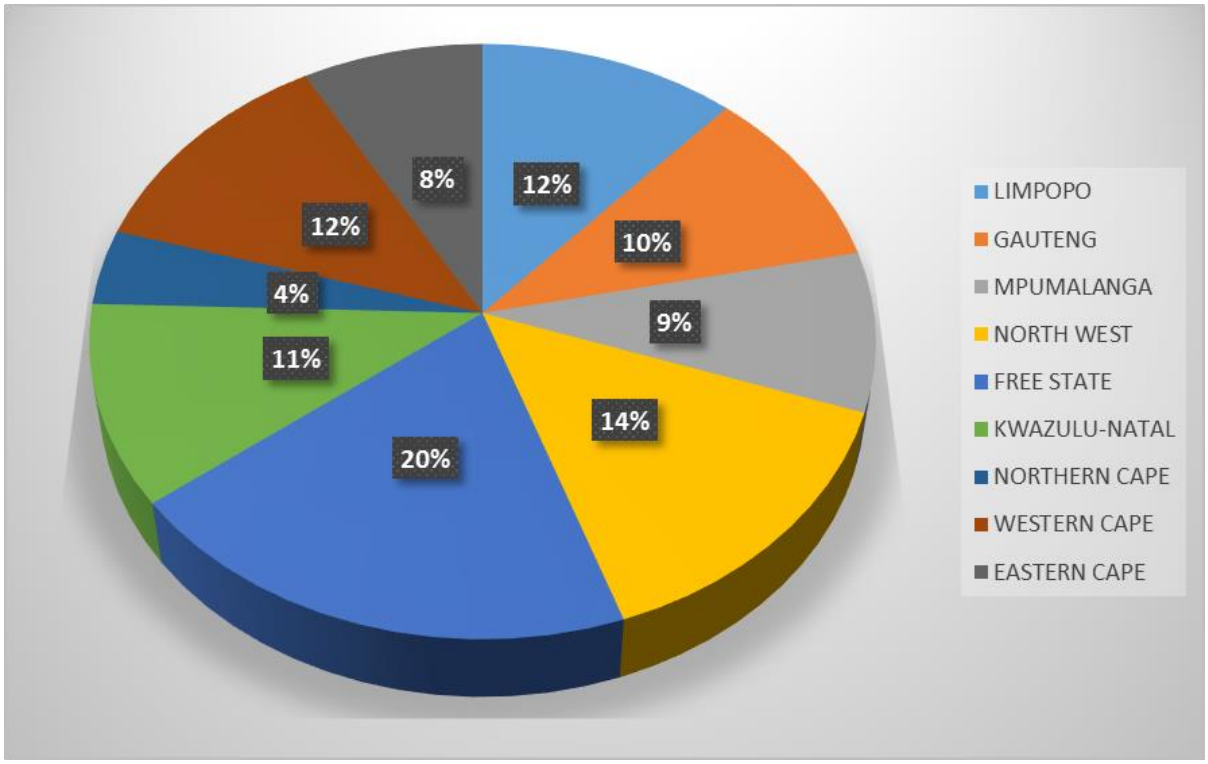

Figure 2.1: Provincial percentages of households that receive housing subsidies

Source: Stats SA (2015)

Mayo and Gross (1987) stated that housing subsidies in most developing countries face severe budget constraints and also that the ability of governments to subsidise housing on a wide range is limited. A sum of money granted by the government is sought to serve equity and efficiency, and these subsidises should be explicitly set to rationalise and allow for full monetary control, if it is fiscally possible (Mayo and Gross, 1987).

2.5.2 Socio-Economic Factors influencing a household's welfare

In this section, the socio-economic characteristics that affect a household's welfare in the study area are presented. The socio-economic variables include gender, age, and household size.

2.5.2.1 Gender

Gender plays different roles among social groups globally, due to issues such as income inequalities, culture and religion. For instance, the United Nations Research Institute for Social Development (UNRISD, 2010) has observed that in many developing economies, females remain more likely to be underprivileged, compared with their male counterparts. UNRISD (2010) further explained the causes underlying females' higher risks of economic insecurity as complex and overlapping in nature. Females have weaker attachments to the labour market since they have lesser access to public services. This accounts for females having lower income and higher poverty rates. Informal employees face increased levels of risks, while the majority are not covered by government support or social assistance. The majority of females are informal workers and they face specific and sharp menaces in the labour market and through the lifecycle (Holmes and Scott, 2016). More females than males are left out from government or non-government agencies that provide a guarantee of compensation for a specific loss or ill-health (Holmes and Scott, 2016). An increasing number of countries are extending social insurance to manual workers and they have exceptions since most strategies remains to be gender biased. The gender-receptive organisations can ensure coverage of females, including female informal employees, to ameliorate the risk they face (Holmes and Scott, 2016).

Given the fiscal restriction on the extent of global coverage of social assistance, there is a need to target and implement influential systems of social insurance. This will cover the informal workforces, especially in low and middle income countries, that make up the majority of the working population. Van Ginneken (2009) stated that there is a growing non-traditional occupations in informal labour because of moderate retrenchment of formal sector workers in many emerging economic countries, as well as in some developed nations, resulting from the global crisis (Chen, 2012). In various countries, females are represented in disproportionally large percentages in the informal workforce where they are faced by low wages, and they work in casual and dangerous work environments (Holmes and Scott, 2016). Females represent a great percentage of the millions of people making a living from informal occupations.

Other researchers argue that females were excessively represented in the agricultural segment, which is an occupation that is poorly paid (Holmes and Jones, 2010; ILO, 2009). However, they believe that there is a growing gender breach between incomes as a result of focusing the attention to females in low paying industries, difference in skills and work experience, and complete discrimination. There is growing evidence that gender dynamics

are fundamental in accessing services (Sen and Östlin, 2007; Levine *et al*., 2008). For instance, Sen and Östlin (2007) and Levine *et al*. (2008) established that males and females face different challenges under various cultural regimes. Ulrich (2016) found that female workers were concentrated in informal employment across the sectors, with pitiable working conditions, low salaries, and very restricted legal and social security. Therefore, females are excessively concentrated in lower-class professions that intensify their potential for poverty. These females are left without government support and social protection from economic and welfare shocks. Females, particularly in developing economies, are wholly directed in informal employment, which is work without access to government support. Although in the same socio-economic group as males, females are more likely to have no assets and be illiterate, which leaves females more socially isolated than males are (Kabeer and Subramanian, 1997). Holmes and Jones (2013) indicated that cultural norms restrict females to tasks of domestic duties that restrict their interactions with public administrative procedures.

Although government support may perhaps be high on the policy itinerary in global development circles, the part it takes in practice at nation and local levels is extremely political, with substantial consequences on gender and gender-related outcomes (Holmes and Jones, 2010). However, Kabeer (2008) has stated that there is a significant robust body of substantiation on the differing ways in which females and males experience poverty and vulnerability. A study by Burns *et al*. (2005) argued that social assistance reaches significantly more females than males, but the effects of social assistance such as grant earnings on the well-being of other household members and changes in ultra-households allocation of labour depend vitally on whether or not the person who receives the social grant is female. For instance, Makgetla (2004) found a negative association between females and income. The author found that female workers continue to be without jobs, have low wages and less access to assets than males do.

Similarly, Rogan (2013) found that gender was an important determinant of income in society. Rogan (2013) explained that there is an increasing change in income rates between female-headed households and male-headed households. The author found that there is a relationship between female reported households and female members being identified as the main bread winner. However, welfare implications are more likely to be underestimated, with a rising income risk and poverty in female-headed households, compared to male-headed households. Figure 2.2 illustrates the gender characteristics of an informal economy. As shown in Figure 2.2, males tend to be higher up, at the upper part of informal economy, whereas females lean towards the lowermost section among industrial workers. Therefore, in the intermediate segment there is a relative share distribution of males and females. In

general, there is a huge gap between male and female earnings, females are paid less for the type of work they do than males are, even within the same broad category of employment (UNRISD, 2010).

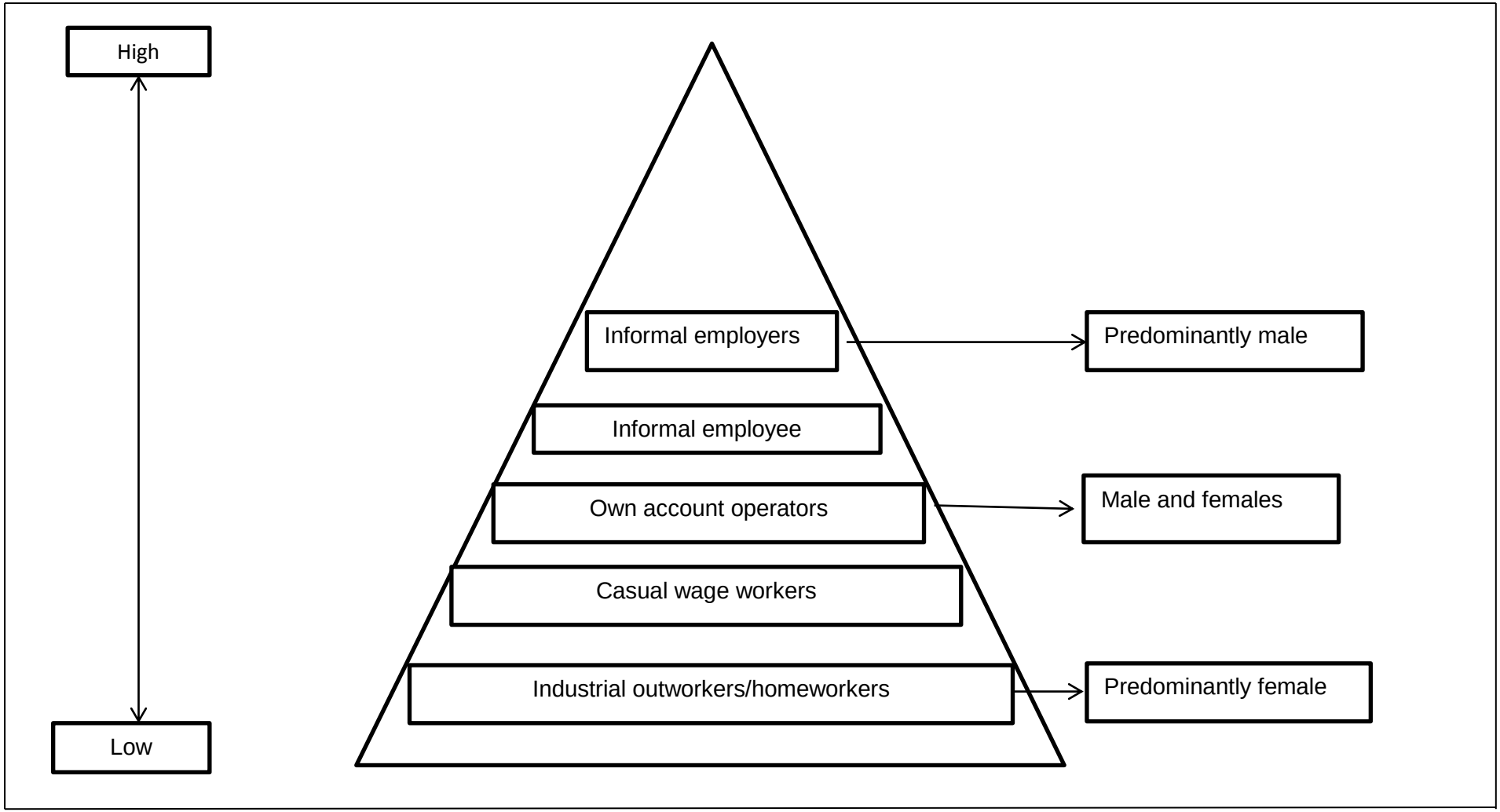

Figure 2.2: Gender Characteristics

Source: Chen, 2012

2.5.2.2 Age

According to Statistics South Africa, getting old is a significant biological phase in an individual's lifetime (Stats SA, 2014). However, its influence on the welfare of various societies in the country differs. According to Devasahayam (2009), population ageing is an inevitable demographic trend across the world, felt initially in the developed economies. As nations advance, there is an associated increase in life expectancy that places a substantial demand on health care and social security systems as an end result of old age dependency. There are diverse arguments and discussions concerning the correlation of age and welfare. Some researchers have stated that the numbers of older people in developing economies is increasing (Mujahid *et al*., 2008). This poses socio-economic challenges for developing countries. However, adults often work in informal sectors and have inadequate access to formal government support, such as pension funds and personal savings.

For instance, Shang and Goldman (2008) observed that age has a significantly negative impact on government support. The results of the study showed that older people place inordinate strain on state-owned assets, predominantly healthcare expenditure and social security. Ramashala (2012) noted that the rapid growth in the numbers of older people, worldwide, has created an unknown global demographic. Moreover, the proportion of the world's population aged 60 and over is increasing more rapidly. The growth in life expectancy offers new opportunities but also creates challenges for the future. In the developing economies, ageing populations are now increasing at unprecedented rates, while most of the poor still live in poverty.

Leibbrandt *et al*. (2005) stated that due to social and economic constraints in Africa, ageing is affecting the way in which people live and work, and especially their well-being, because of uncontrolled poverty and the HIV and AIDS pandemic which is ranging across the continent. Statistics South Africa (2014) observed an influence of age on welfare, which supports the assertion that the more elderly individuals in South Africa are poor. A provincial variation was used to reveal that rural provinces have greater percentages of underprivileged ageing individuals, compared with the urban provinces. However, Limpopo province is one of the outlying areas and has the highest proportion of poor elderly persons (Stats SA, 2014). Further findings show that higher socio-economic deprivation exists among households headed by elderly people.

2.5.2.3 Household size

Downey (1995) observed that a small household size and fewer children provide many benefits, both to the parents and children. Evidence from Orbeta (2005) demonstrated that household size contributes greatly to household welfare. For example, Orbeta (2005) observed that a larger household size has a clear negative impact on average children in household welfare. The negative impacts on low and middle income households and the poor are larger. They further explained that the association between a larger family size and poverty and vulnerability is strong and enduring. A large family size has direct debilitating effects on many aspects of a household's welfare.

Evidence from a study by Black *et al*. (2005) has shown a negative connection between household size and children's education. For example, Black *et al*. (2005) observed that a large family size has substantial and great undesirable consequences on children's education. They further explained that a large household size might affect children negatively through resources dilution or because of low levels of household maturity. According to Arthur (2005), the size of a household is a matter of inordinate significance, not only for the nation as a whole but also for the well-being of individuals, the household and the community. Ravillion and Lanjouw (1995) broadly explained that larger-size households are more likely to lack sufficient money for living at standards considered comfortable in developing countries. There is a significant indication of an undesirable connection between household size and consumption or income per person in emerging countries.

2.6 The Welfare Concept

When a society has the ability to fulfil its people's needs, one can say that they are well off. Individual needs are not constant: they can escalate or decline depending on changes in personal circumstances. For instance, increases in food prices have a significantly great influence on a household's welfare, in mainly low income and deprived households. According to Greve (2008), welfare can be interpreted as an everyday person's life perspective, and can also be surveyed on a societal macro-level, according to whether one understands it from an economic or societal perspective. He further explained that welfare can be measured in terms of money, focusing on macro-level understanding of it, since money can be used as an indicator for gross domestic production per capita. Generally, consumption and income are considered the main indicators of welfare, and they can be used to track and compare the living standards of society. The study by Greve (2008) showed that welfare is the financial support relating to society which is designed to actively encourage the basic physical and material well-being of people in need.

2.6.1 Welfare Measurement

Welfare can be estimated using a wide range of parametric and non-parametric approaches. Ligon and Schechter (2003) explained that a household's sense of well-being does not only depend on its average income or expenditure. They explained that a household's welfare also depends on the risks the household faces, particularly households with few resources. Different methods of measuring a household's welfare have been proposed. Literature reveals that measuring household welfare provides the basis for targeting social and economic risk and formulating policy implementations (Elbers and Gunning, 2006). They further explained that welfare measures might possibly increase both the targeting and the choice of appropriate interventions. The most commonly used welfare approaches to evaluate a household's social welfare are the compensation variation, equivalent variation, and consumer surplus and money metrics methods. The next sections are devoted to discussing different approaches to measuring welfare.

2.6.1.1 Equivalent Variation Analysis

The equivalent variation approach, proposed by Hicks (1939), is based on the change in wealth, at current prices, that would have the same effect on consumer welfare as would the changes in price, with income unchanged. Donaldson (1992) further explained that this approach can be used to estimate poverty lines and compute the denomination of welfare ratios. For example, in a positive economic change such as a decrease in price, the equivalent variation method would increase income that would give the consumers the equivalent additional utility that might occur if the price actually decrease or falls (Hicks 1939). Hicks (1939) stated that in an undesirable economic change, the equivalent variation method would be the amount of income that would be taken away to lower the consumer utility to the level that would happen if the economic change had occurred. The main strength of the equivalent variation method is that it is based upon original prices (Arora, 2013). For example, the equivalent variation method determines the income adjustment which would render an individual's position equivalent to what it would be, once the price changes result in policy change. This technique treats consumers as if they are keen to pay to avoid a less preferred situation or are prepared to accept in order to forego a more preferred situation (Seller *et al*., 1985). The main weakness is that it requires a demand function (Arora, 2013).

The application of equivalent variation in estimating change in welfare is becoming very common in social economics research. Groot *et al*. (2004) applied equivalent variation to estimate the income variation of health impairments and individuals' willingness to trade

money to improve their health status. Greenwood and Kopecky (2011) examined the welfare gain of consumers after the introduction of personal computers using an equivalent variation approach.

2.6.1.2 Consumer Surplus

Consumer surplus is the most widespread measure used to ascertain the size of individual welfare. Arora (2013) referred to consumer surplus as the change between the maximum amount consumers are prepared to pay and the price they actually pay. Becht (1995) further explained that the amount which an individual pays for goods or services can never go above, and hardly ever comes up to, that which he would be prepared to pay rather than go without it. The level of consumer surplus changes as the market price for goods and services changes (Arora, 2013).

The consumer surplus approach has been applied in an empirical framework to estimate welfare change in households and for individuals in society. Brynjolfsson and Smith (2003) applied consumer surplus to estimate and measure the quantity of the economic influence on the increased product variety made available through the electronic market for bookstores. They estimated that online bookstores improved consumer welfare by $731 million to $1.03 billion in 2000, which is equal to 7 to 10 per cent times larger than the consumer welfare gain from increased competition and lower prices in the market. Layson (2005) examined consumer surplus for a major city development, the Greensboro Coliseum Complex (GCC), across households of different income levels. The results show that consumer surplus from the GCC in 1991 surpassed the public subsidy for this complex, but an unequal amount of consumer surplus accrued to higher income households. Izadkhasti *et al*. (2013) applied consumer surplus to estimate the welfare cost of inflation in Iran in the period from 1978 to 2010. They estimated the inflation rate to be 1 per cent to 30 per cent increase of the gross domestic production in Iran.

2.6.1.3 Money Metric Utility

The money metric utility approach, proposed by McKenzie (1957) and Samuelson (1974), is motivated by the idea that to sustain a household's or an individual's standard of living, money is required. This requires that consumption could be altered slightly in order to achieve a desired consumer price index that reflects the prices that households face, and whose weights are different for each household (Deaton and Zaidi, 2002). The main strength of money metric utility is that it provides an index of convenience level for all household members, unlike the compensation variation method (Donaldson, 1992). The main

weakness is that the calculation requires knowledge of preferences and it constitutes the wrong space in which to make assessments of welfare and individual well-being (Sen, 1977). A study by Saygili (2012) employed a money metric utility approach to estimate change in welfare due to equivalent variation and consumer surplus inability to measure standard of living using money to sustain the households. Saygili (2012) analysed the consumption inefficiency, and the results showed that family-unit spending is relatively explained by the variations in the consumption inefficiency, and the efficiency is not autonomous of financial management account.

2.6.1.4 Multivariate Analysis

Hidalgo and Goodman (2013) indicated that multivariate analysis is used to model and describe the interactions and correlation between a group of time-series variables which include consumption variables, earnings, stock prices and dividends, spot exchange rates, and money growth. Zezza *et al*. (2008) stated that this method can be employed to test robustness through the running of a regression of the stimulated welfare percentage change on a number of a household's demographic characteristics. This model describes and summarises macroeconomic data, and qualifies what we might know or do not know about the structure of macro-economy (Hidalgo and Goodman, 2013). Therefore, this model can help macroeconomic policymakers in decision making regarding the social development of society.

Other studies have employed multivariate analysis to isolate the correlates of change in welfare and to test the robustness of descriptive results due to the compensation variation methods' inability to simultaneously control variables addition (Chen and Ravallion, 2004; Zezza *et al*., 2008). Chen and Ravallion (2004) employed multivariate analysis to estimate welfare change in China. The results showed that the coefficients were not straightforward to understand, as they included the effects of both consumption and production. A similar study by Zezza *et al*. (2008) applied multivariate analysis to estimate the effect of an increase in prices of the most important tradable basic foods in developing countries' households using a nationally representative household survey. The results showed that in the short run, low income households and households with inadequate asset endowments and access to agronomic inputs are hardest hit by an increase in prices.

2.6.1.5 Propensity Score Matching

Propensity score matching (PSM) analyses the pairing of treatment and control elements with comparable values on the propensity score and probably other covariates, while

removing all the incomparable units (Rubin, 2001). The theory of propensity score matching was introduced by Rosenbaum and Rubin (1983), followed by Heckman (1997). Propensity score matching comprises five kinds of methods, namely nearest neighbor matching (NNM), radius matching, Kernel-based matching (KBM), Mahalonobis metric matching, Stratification matching and calliper matching (Thavaneswaran and Lix, 2008). Propensity score matching methods can be used as a substitute technique to evaluate the influence of getting treatment when random assignment of treatments to subjects is not achievable (Thavaneswaran and Lix, 2008). They further explained that the method can be used to associate two sets of subjects and can also be useful in the analysis of more than two groups. According to Rosenbaum (2004), propensity score matching can enlarge the robustness of the model-based alteration and evade unnecessarily detailed descriptions.

The main strength of propensity score matching is that the technique is readily applicable when dealing with great numbers of unequally scattered control data in a set (Baser, 2006). Thavaneswaran and Lix (2008) further explained that the method does not justify the propensity resulting from unobservable explanatory variables that may possibly influence and determine whether the subject received treatment or not. The main weakness of PSM is that it requires large samples, and there must be considerable similarity within the groups on the propensity score in order for it to be an effective tool in providing support for casual inference. Therefore, this method will have less value if variables with great propensity scores are estimated and the variables with smaller propensity scores are not estimated.

Other studies have employed propensity score matching to estimate the casual effect of interventions and treatment of covariates (Dehajia and Wahba, 1999; Wolfe and Michaud, 2004; Li, 2012). A study by Donkor *et al*. (2016) employed a PSM method to analyse the impact of row-planting technology on rice productivity in Northern Ghana.

2.6.2 Compensation Variation Method

As Adom (2014) has said, the compensation variation method attempts to measure the gain and loses in welfare in terms of income or the income level of households before the changes in price happened. This method is a non-parametric model that has become increasingly common in the analysis of price and change in welfare (Pons, 2011). The methodology was first introduced in a study by Deaton (1989), and since then, this study has been applied empirically in many other studies such as Budd (1993), Barret and Dorosh (1996), Minot and Goletti (2000), and recently, Ivanic and Martin (2008), Rios *et al*. (2008) and Pons (2011). Ferreira *et al*. (2013) stated that this method represents any differences between two (02) expenditure variables and uses of the household surveyed as a source of

information. Adom (2014) stated that this method is limited to short-run analysis which captures potential gains through wages. The main strength of the compensation variation method is that it uses the initial welfare level as a reference level and treats the consumers as if they were willing to pay to obtain a more preferred situation (Seller *et al*., 1985). The compensation variation method is straightforward and is based on utility in terms of income (Arora, 2013). Based on the methodological review, the compensation variation is considered appropriate since the study incorporates different households' attributes of welfare. A review of the compensation variation method is discussed.

2.6.2.1 Empirical Application of Compensation Variation (CV) in Welfare Estimation

The application of the compensation variation method in estimating the gains and losses in welfare in terms of income is becoming common in quantifying the change in welfare. Deaton (1989) applied a compensation variation method to estimate the effect of presumed changes in the price of rice on income levels in Thailand. The author explained that increasing the prices of rice was beneficial for households' income in rural areas of Thailand. Barret and Dorosh (1996) employed a non-parametric technique approach of compensation variation to examine increases in rice prices in Madagascar. The results show negative impacts on rural low income households because the net sellers' gains for rice were concentrated among the higher income farmers. A study by Ivanic and Martin (2008) examined the impact of increased prices of certain staple foods on the level of poverty in nine (09) less-developed countries. The results revealed that higher prices for certain staple foods increase poverty in many of the countries

Pons (2011) applied a compensation variation method to estimate the effects of rising food prices on low income households in India. They estimated that households in rural areas were more susceptible to rising food prices than households in urban areas were. Furthermore, the low income households living in both rural and urban areas felt the effect of increasing food prices more than high income households did. Nelson *et al*. (2011) applied CV to examine the effects of rising food prices in Mexico. They found that about 3 per cent and a little more than 1.5 per cent of households became extremely poor. Hoang and Glewwe (2009) examined the impact of rising food prices on the level of poverty and economic welfare in Vietnam, looking at rising food prices and the real income of farmers, but reduced the net welfare of those purchasing food. The results show that, on average, there was an equal increase, in both food consumers and producers, with an average of 56 per cent for the Vietnamese household, and that an equal increase in rice prices would negatively affect the welfare of low income households by an estimated 54 per cent and

about 925 of urban households. They further explained that the reason why average household welfare increases is due to the average welfare loss of the households whose welfare declines (net buyers) is smaller than the average welfare gain of the households whose welfare increases (net sellers).

CHAPTER THREE: DATA AND METHODOLOGY

Introduction

The aim of this chapter is to present and discuss the data and the procedures employed in this study. The first section involves an overview of the study area in terms of geographical location, income classification in South Africa, data collection, and the sampling approach used in the study. The socio-economic characteristics of the respondents are also included in the section. The second section describes the methodology employed in analysing the specific objectives of the study, followed by the conclusion.

3.1. Study Area

3.1.1. Location and Physical Environment of South Africa

South Africa is located at the southern tip of Africa, and stretching attitudinally from 22°S to 35°S, and 17°E to 33°E longitudinally, as shown in Figure 3.1. The total surface area of South Africa is approximately 1 219 602 km2 and is a medium-size country. On the Atlantic coast, South Africa stretches for more than 2500 km from the desert to the border with Namibia, and southwards around the tip of Africa, then north to the border with subtropical Mozambique on the Indian Ocean (Alexander, 2015). On the northern part, South Africa share borders with Namibia and Botswana, touches Zimbabwe, and shares a strip of a border with Mozambique and curve around Swaziland, with the Kingdom of Lesotho in the interior, surrounded by South African territory. South Africa is classified as semi-arid and has considerable variations in climate, as well as topography.

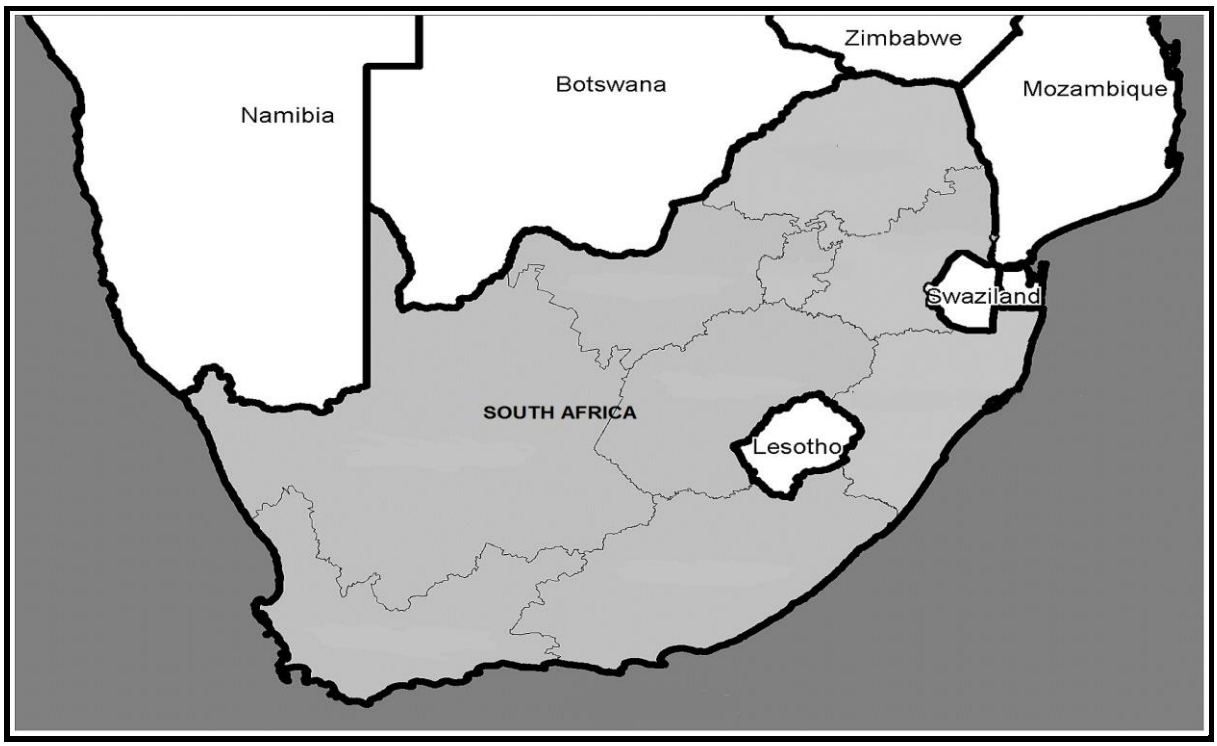

Figure 3.1: Map of Southern Africa.

Source: Adapted from Google Maps (2016)

For administrative purpose, South Africa is divided into nine (9) provinces. These provinces are Western Cape, Eastern Cape, Northern Cape, Free State, North West, Gauteng, Limpopo, Mpumalanga and KwaZulu-Natal. These provinces vary considerably in size, with Gauteng being the smallest but the most populated province in the country, while Northern Cape is the largest and takes up a third of South Africa's total area. South Africa has three main capitals, with Bloemfontein in the Free State as the judicial capital and home of Supreme Court of Appeal, and Cape Town is where the country's parliament is found, while Pretoria in Gauteng is the administrative capital and ultimate capital of the country.

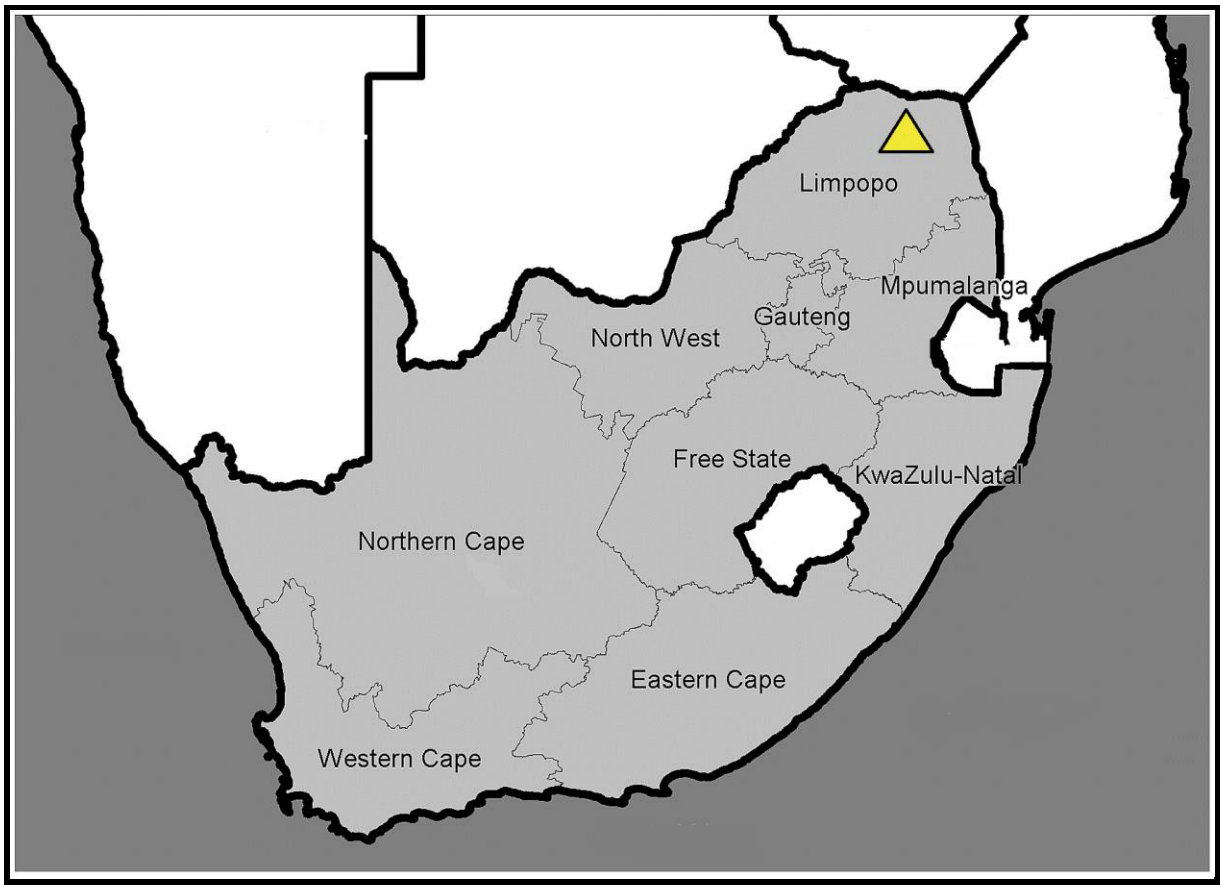

Figure 3.2: Administrative Provinces of South Africa

Source: Adapted from Google maps 2016.

Limpopo is of the nine provinces in South Africa, named after the Limpopo River that flows along its northern border. Limpopo, bordering Botswana, Zimbabwe and Mozambique, is located at the northern tip of South Africa, at the top of the country, between longitude 29.4179°E and Latitude 23.4013°S, as indicated in Figure 3.2. The total population of Limpopo is estimated at 5 630 500, which represents 10.4 percent of the total population of South Africa. The province is rich in wildlife, natural beauty and historical and cultural treasures. Limpopo produces a wide range of agricultural products, and also has abundant mineral resources, making mining the critical sector of the province's economy through contributing 22 percent of the gross domestic product. Limpopo province is divided into five district municipalities, being Capricorn District Municipality, Mopani District Municipality, Sekhukhune District Municipality, Vhembe District Municipality and Waterberg District Municipality, which are in turn divided into twenty-five local municipalities.

3.1.2. Income Classification in South Africa

According to the Organisation for Economic Cooperation and Development (OECD, 2014), Income consist of earnings, capital income, public cash transfers, income taxes and social security contributions. These constitute a households disposable income in a given year. A study by Van Der Berg (2011) showed that there is no one means of distribution of income, but many income distributions. In other words, income is distributed across racial groups, income classes, and within the present and future generations. The income classification ranges from very low to very high incomes, as shown in Table 3.1, on a monthly basis. This study focus on, low income group and the middle income group, to analyse the impacts of government support on their households' welfare.

Table 3.1: Income Classification in South Africa

Quintiles	Groups	Monthly Income
1	Very low	Up to R1783 per month
2	low	R1783 up to R2979 per month
3	middle	R2979 up to R5135 per month
4	High	R5135 up to R11840 per months
5	Very high	R11840 and more

Source: Labour Research Service (LRS, 2015)

3.2. Data Collection

3.2.1. Source of Data

The income and expenditure survey data for Limpopo province (2010/2011), sourced from Statistics South Africa, was used in this study. The data was collected from the nine (9) administrative provinces of South Africa by means of structured questionnaires. Income and expenditure survey data comprise pilot data aimed at observing income levels of different households in South Africa. This data includes headings for food, beverages and tobacco, clothing and footwear, housing, water, electricity, gas and other fuels, furnishings, household equipment, health, transport, and education.

Limpopo was selected because the province features prominently in South Africa's poverty ranking as being one of the least developed, and it remains the poorest in the country (Stats SA, 2002). The income and expenditure survey data captured relevant income groups within the province. Other information relating to a household, such as socio-economic and institutional factors (government support) and household's assets was also captured in the

income and expenditure survey data. The socio-economic variables include age, gender, settlement type, educational level and race, while institutional factors include participation in the Reconstruction and Development Programme (RDP), subsidised housing, access to piped water, paid water, free electricity, and access to electricity and households assets such as a radio, television, DVD player, motor vehicle, and motor cycle.

3.2.2. Sampling Technique and Size

The sampling frame for the income expenditure survey was obtained from Statistics South Africa's Masters Sample (MS), based on 2001 census enumeration areas (EAS). The income expenditure survey (IES) employed the Masters scope of coverage of all households within South Africa and targeted all qualifying households in South Africa. The master sampling involved two sampling techniques. The first technique utilises the person's file; this file contains all information regarding the household's members that respond to the survey. For the second technique, a house file was compiled. This file contains all information collected about a household's characteristics, including the household's assets and the number of persons supported by the head of the household.

The household data was merged with the person's household information data, using a unique identifier for households, being an eighteen-digit number that signifies a primary sampling unit (PSU), dwelling unit, and household. Three thousand, three hundred and six households (3306) were extracted from the national IES 2010/2011 data for Limpopo province.

3.3. Characteristics of Respondents

To determine the welfare changes for low and middle income households in Limpopo province attributable to the impacts of government support, descriptive statistics such as frequencies and percentages were used. Factors influencing changes in welfare of low and middle income households in Limpopo was estimated using the chi-square and estimated multinomial logistic regression model, using STATA 11. Multinomial logistic regression was employed because of the ordinal nature of dependent variables and also because it has been widely used for analysis of data such as categorical data, which justifies the use of multinomial logistic regression (Owusu-Sekyere, 2014). Moreover, the ordinary binary probit model does not account for the ordinal nature of the dependent variable.

The next section presents a description of the sampled household income categories in the study area. These include income classification, institutional factors, sources of income, and

socio-economic characteristics. The characteristics of the respondents' income classification are presented in the next section.

3.3.1. Income Classification from Low to Very High Income

Respondent household income distributions are presented in Figure 3.3. To acquire information on household welfare in the study area, the survey questionnaire captured information about income classification in South Africa according to monthly income. Income category is needed to estimate the state of welfare in households in the study area. According to the Labour Research Service, Statistics South Africa divides household monthly income into five quintiles, as reflected in Table 3.1. In this study, the very low and low income categories were combined, since the respondents were few in number, and accordingly the study uses the four income groups of low, middle, high, and very high income to analyse the impact of government support on the welfare of low and middle income households.

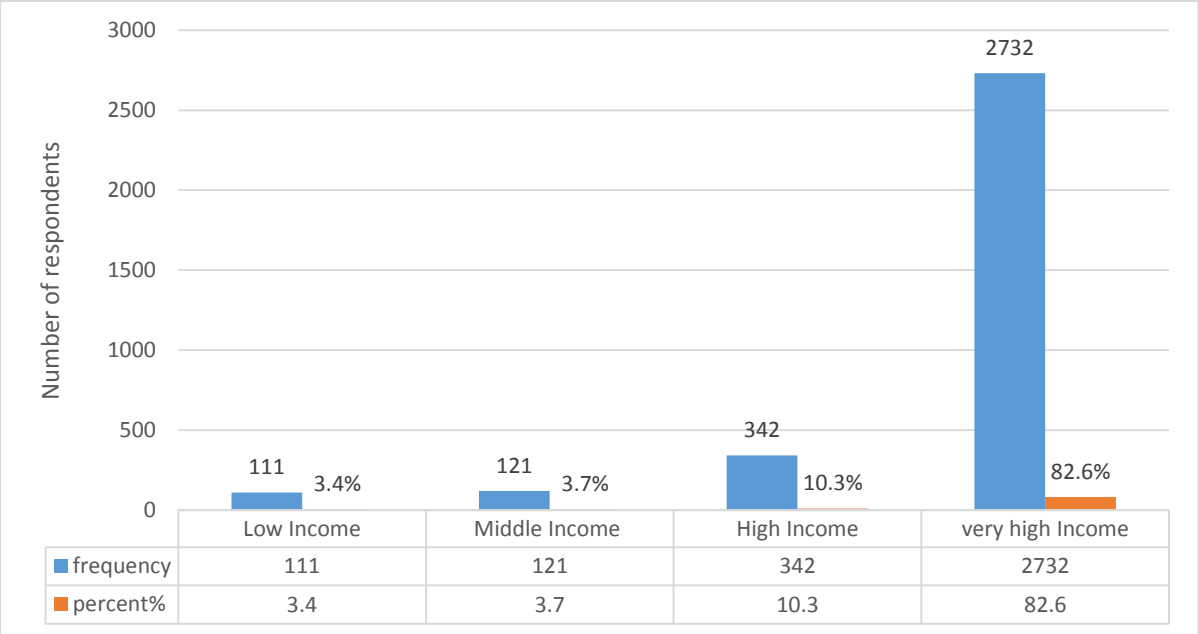

Figure 3.3: Income Classifications

The survey shows that about 82.6 percent of households in the study area are under the very high income category, 10.3 percent are high income households, 3.7 percent are middle income, while 3.4 percent are low income households. The results indicate that the majority of households in Limpopo are high income households, compared with other

income groups, with the majority of 82.6 percent being in the very high income household category. These results suggest that even though Limpopo has over 80 percent of its population in the very high income category, it is still one of the poorest provinces.

3.3.2. Institutional Factors (Government Support)

3.3.2.1. The determinants of household welfare

This section provides the institutional variables that are government-based. The institutional factors obtained are RDP support, subsidised house, access to piped water, paid water, free electricity, and access to electricity. The institutional factor gives an indication of government support. The institutional factors influencing household welfare are presented in Figure 3.4.

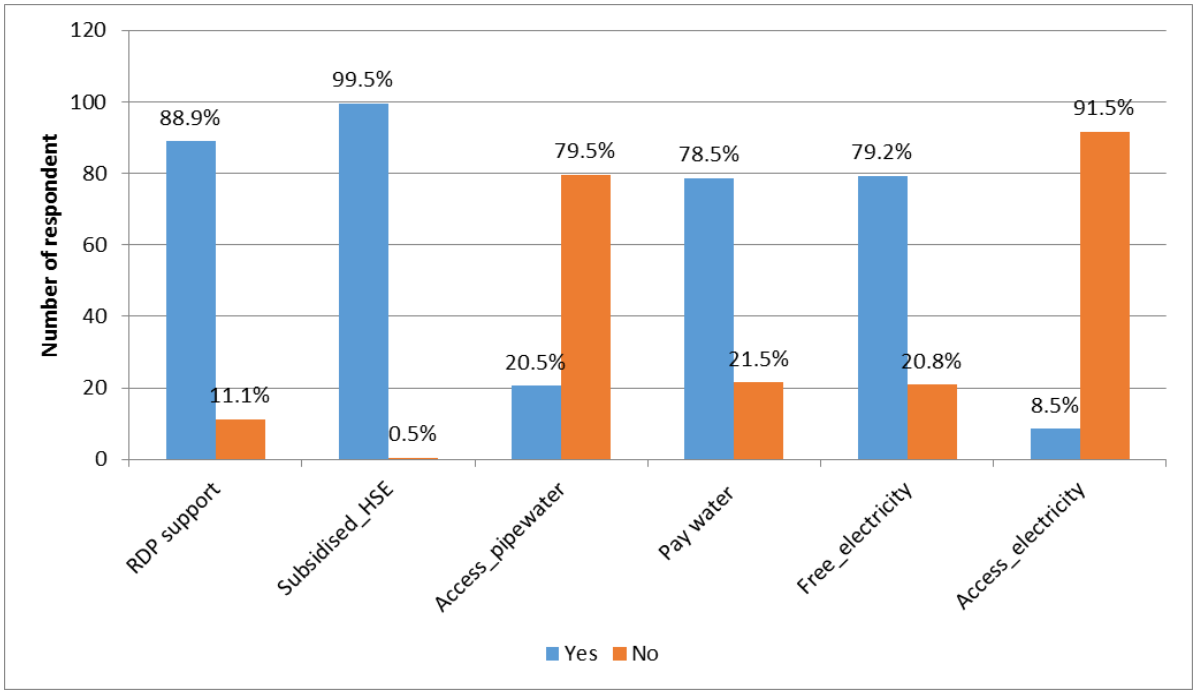

Figure 3.4: Determinants of household's welfare in Limpopo

The results in Figure 3.4 show that 88.9 percent of households in Limpopo had RDP support from government, while 11.1 percent households did not receive such support from government. The majority of the households 99.5 percent received subsidised houses from government, while 0.5 percent did not receive subsidised houses. The results revealed that 20.5 percent of households in Limpopo have access to piped water, while 79.5 percent do not have access to piped water. In terms of payment for water, the majority of 78.5 percent of households in Limpopo pay for water services, while 21.5 percent do not pay for water. Looking at the statistics for access to free electricity, the results reveal that 79.2 percent of households in Limpopo receive free electricity, while 20.8 percent do not receive free

electricity. In terms of access to electricity, 8.5 percent households had access to electricity, while majority of 91.5 percent did not have access to electricity. The results indicate a lack of government support to households; although some households do receive support such as basic services being delivered to the households in need of this support, other households still have no access to such services. Looking at access to electricity, 91.5 percent of households in Limpopo do not have access to electricity, and 79.5 percent do not have access to fresh water.

3.3.2.2. Sources of Income for the Households

Sources of income refer to how the households obtain their monthly income. The responses of the households with respect to income are summarised in Table 3.2. The results were recoded using 1 for Yes and 0 for No

Table 3.2: Sources of Income in Limpopo Province

Characteristics	Salary source	Frequency	Per cent (%)
Business	Yes	3208	97.0
	No	98	3.0
Subsistence farming	Yes	3298	99.8
	No	8	0.2
Pension fund	Yes	3231	97.7
	No	75	2.3
Social welfare (Grants)	Yes	2758	83.4
	No	548	16.6
Maintenance	Yes	3279	99.2
	No	27	8
Allowance	Yes	3268	98.9
	No	38	1.1

The results in Table 3.2 show that 99.8 percent of households in the study area are taking part in subsistence farming and that they receive income from the products they produce for their households, while 0.2 percent of the households do not farm to sustain their families and sell in the markets to receive income. The majority which is about 97.7 percent of the households receive pension payments as a source of income, while the remaining 2.3 percent do not receive pension payment. The results reveal that 83.4 percent of households in the study area receive social welfare (grants), while 16.6 percent of households have no access to social welfare from Government.

3.3.3. Socio-Economic Characteristics

The socio-economic characteristics of the respondents which includes gender, race, settlement type and education etc., is presented in this section.

3.3.3.1. Gender

The gender distribution of households in Limpopo is shown in Table 3.3. The majority (53 percent) of households in Limpopo were headed by males while 47 percent of the households are headed by female. This shows that the majority of households in Limpopo are headed by males as compared to households headed by females.

Table 3.3: Gender classification across study the area

Gender	Frequency	Percentage
Male	1755	53 %
Female	1551	47%

3.3.3.2. Race

The race of households was categorised into four–African/Black (1), Coloured (2), Indian/Asian (3) and White (4). The results indicate that the majority of the households (97, 1 percent) in Limpopo are African/Black, 2.1 percent are White, 0.5 percent are Indian/Asian, and 0.3 percent households are Coloured.

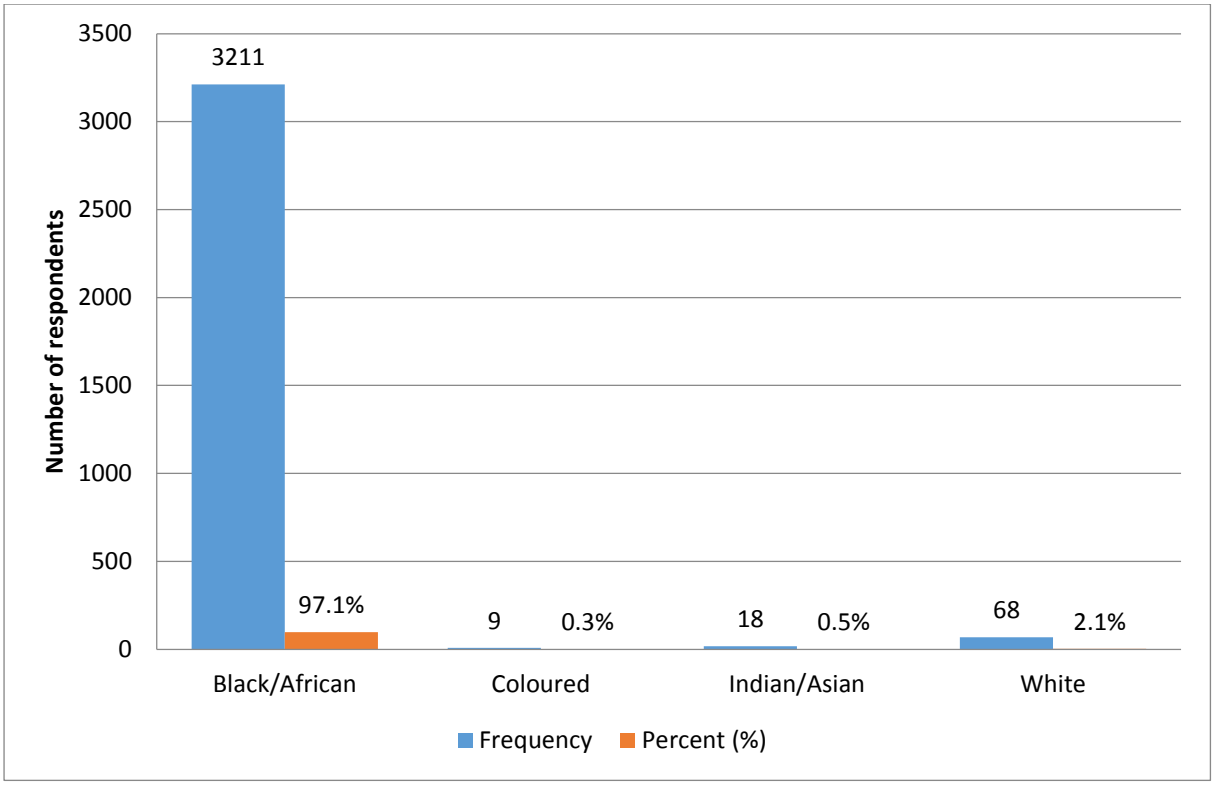

Figure 3.5: Race of Individuals across the Study Area

3.3.3.3. Settlement Type

The types of settlement in Limpopo where households are situated were categorised into four – urban formal (1), urban informal (2), traditional areas (4) and rural formal (5). The survey results set out in Table 3.6 show that 21.8 percent of the households live in urban formal areas, 1.9 percent are located in urban informal areas, 74.6 percent are in traditional areas, and 1.7 percent are in rural formal areas. The results indicate that most of the households in Limpopo are located in rural areas. This shows that many households have low standards of living and that their welfare is not improved.

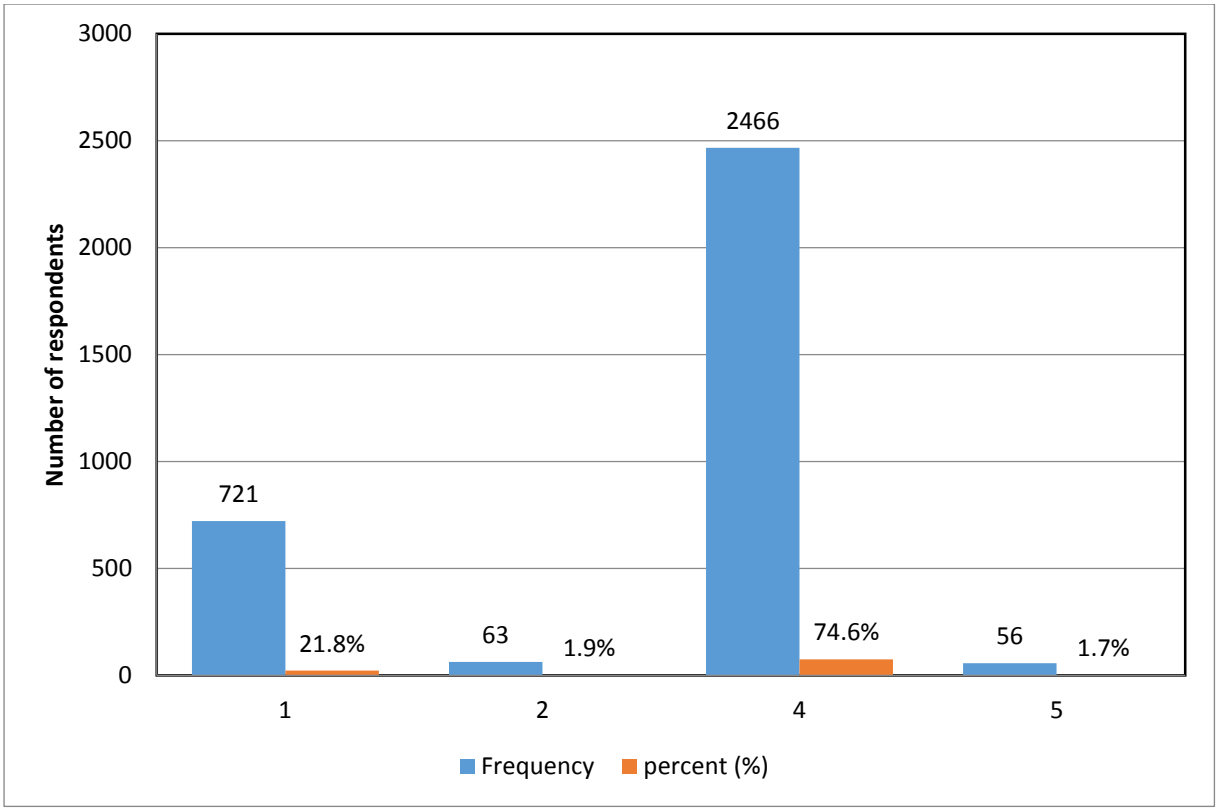

Figure 3.6: Settlement type across the study area

3.3.3.4. Educational Level

The educational levels of low and middle income households were categorised into primary school, high school, tertiary education, no schooling, and unspecified. Primary education indicates that the respondent has had 8 years of formal schooling and they spent 5 years in high school, while tertiary education is 9 or 10 years, depending on whether a person had studied for a three-year bachelor's degree or a 4-year bachelor's degree combined with postgraduate study, respectively. The frequencies of households who had attained these levels of education are set out in Figure 3.7.

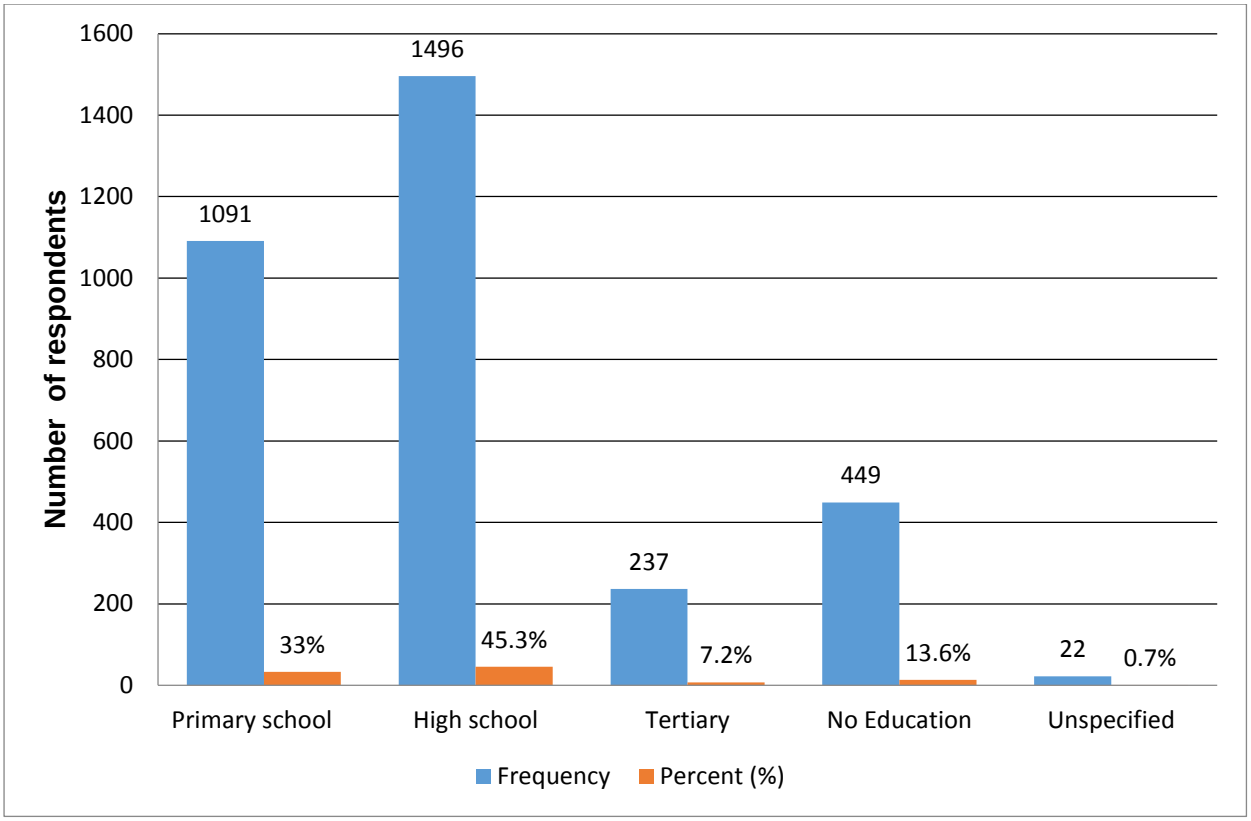

Figure 3.7: Educational Level Distributions of Households across the Study Area

As indicated in Figure 3.7, the survey results show that 0.7 percent of households in Limpopo had not specified whether they had received formal education or no formal education, 13.6 percent of households had no formal education, 33 percent had reached primary education and 45.3 percent had obtained high school education, while 7.2 percent had received tertiary education. Out of 3306 households selected for the survey, 13.6 percent had not received formal education, while 7.2 percent had received tertiary education. The level of tertiary education in Limpopo is generally low, compared with primary and high school education. Low levels of tertiary education can affect the income and welfare of households, since people with primary and high school education usually cannot secure good-paying jobs that might improve their standards of living.

3.4. Age and Household Size

The descriptive statistics in terms of average and standard deviation (Std) of the socio-economic characteristics of income groups for the households in Limpopo, such as age and household size, are presented in Table 3.4.

Table 3.4: Descriptive Statistics of Socio-Economic Characteristics of Income Groups

Variable	Low income group (N = 111)		Middle income group (N = 121)		High income group (N = 342)	
	Average	Std	Average	Std	Average	Std
Age	33	21	32	22	30	20
Household Size	2	2	3	2	3	1

The results indicate that low and middle income households have high numbers of ageing people, compared with people in high income. The average age of people was 33 years in the low income households and 32 years in middle income households, whereas in high income households the average age is 30 years. The results reveal that low and middle income households have larger numbers of ageing people than those with high income.

On average, low income households had household size of 2 people, while the average household size for middle income households was 3 people and the high income household average size was 3 people. The results in Table 3.4 show that the middle income and high income households have large household sizes, compared with the low income households.

3.5. Analytical Method

3.5.1. Compensation Variation Method

The methodology in this study deals with the effects of government support on the economic welfare of low and middle income households in Limpopo. Changes in a household's welfare effectively depend on whether the household welfare is improved by government support. The welfare effects estimated represent the impacts on household welfare after the household had received government support. In that case, the welfare effect estimated will show whether the household's standard of living became better or deteriorated after any adjustment has taken place in the households. To estimate the welfare effects in households, the study analyses the production and consumption pattern of households. The compensation variation method was employed to evaluate the welfare of the individual households.

In this method, given the change in welfare, the net effect of household welfare change depends on the household's condition as a recipient, contrasted with a household that does not receive government support. If a household receives government support, the household would be expected to experience improved living conditions since parents would be able to enrol their children in school and even get better health care in the long run. To measure welfare changes empirically, the useful concept expressed in the compensation variation

method is employed. Zezza *et al*. (2008) referred to compensation variation as the gain and loss of income necessary to bring the household back to its original position before the economic change. This study follows the work of Deaton (1989), which has been applied in several empirical studies such as Budd (1993); Barret and Dorosh (1996); Ivanic and Martin (2008); Pons (2011); and Arora (2013).

In order to capture the immediate welfare effect changes of government support on the low and middle income households in Limpopo province, welfare is determined by a compensation variation method. The compensation variation model can be specified as:

$$\frac{\Delta w_i}{\chi_{oi}} = \frac{\Delta p^{p}}{p_o^{p}} PR_i - \frac{\Delta p^{c}}{p_o^{c}} CR_i \qquad (1)$$

Following the work of Zezza *et al*., (2008), $\Delta W_i$is the first order approximation of the change in welfare of the household i of a change in government support, χ_{oi} is the original income of household i, $P^p o$ is the original price at which production is valued, $P^c o$ is the original price at which consumption is valued, $PR_i$is the household's production value for household i, as a proportion of income, (proxied by own production plus subsistence farming), and $CR_i$is the consumption value for household i as a proportion of original.

The above equation estimates the after-effect response, which takes into account household responses using consumption and production decisions. The equation can be readily adjusted to account for different degrees of transmission of changes in household welfare, and variation in income changes within each household. The perception behind the equation is that households are well off if they receive any form of government support (social grant). On the contrary, if the household receives government support, it will experience a welfare gain, and if it does not, it will experience a welfare loss. Households in this study are expected to improve their standards of living from any given change in social welfare because they receive government support in the form of cash transfers. The study also attempts to capture the possible compensating effect of higher income for those households that receive a minimum wage. Thus, Equation (1) reduces to:

$$\frac{\Delta W_i}{X_{o_i}} = 0.1(P_{R_i} - C_{R_i}) \qquad (2)$$

Following Adom (2014), the descriptive results of simultaneous additional variable control of testing the robustness of the descriptive results were tested by running a regression. A

regression was run on a stimulated percentage change on a number of household socio-economic characteristics, household's assets, and institutional factors of welfare change. The regression helps to isolate the correlates of the stimulated welfare impact. Using the theoretical method specified in Equation (3), the explanatory variables are substituted and the empirical model for each specific variable of household welfare is specified in Equation (3). Empirically, the equation is expressed as:

$$w_i = \alpha + \beta_1 age + \beta_2 gender + \beta_3 hsize + \beta_4 employment + \beta_5 salary + \beta_6 newedu1 + \beta_7 newedu11 + \beta_8 newedu14 + \beta_9 newedu15 + \beta_{10} radio + \beta_{11} television + \beta_{12} dvdp\beta layer + \beta_{13} motorvehicle + \beta_{14} motorcycle + \beta_{15} computer + \beta_{16} washingmachine + \beta_{17} inhsevalue + \beta_{18} inpr + \beta_{19} rdp\,\text{sup} + \beta_{20} subsidisedhse + \beta_{21} medication + \beta_{22} accesspipewater + \beta_{23} accesselectricity + \beta_{24} freeelectricity + \beta_{25} grant + \mu_i \quad (3)$$

Where W_i represents the estimated change in welfare expressed as percentage of initial per capita expenditure of households i, α is a constant term, β is the categorical variable representing household independent variables that are likely to influence the expenditure per capita of household, and μ_i is the error term.

3.5.2. Propensity Score Matching

Propensity score matching indicates the combination of treatment and control units with similar values on the propensity score, and perhaps other covariates, and the removal of all incomparable units (Rubin, 2001). Propensity score matching is employed to evaluate the impact of government support on household welfare. There are two stages involved in this technique. In the first stage, propensity scores (probability) of receiving government support are estimated using multivariate multiple regression. The propensity score matching can be expressed as:

$$W_i(z) = \Pr\left[\lambda_i | Z\right] = \mathrm{E}\left[\lambda_i \middle| Z; W(z)\right) = \Omega\{h(Z_i)\} \quad (4)$$

Where $W_i(Z)$ is the welfare of household i with characteristics Z. $\Omega\{.\}$ is the normal cumulative distribution, and Z is a vector of pre-treatment characteristics (Donkor *et al*., 2016). λ_i Denotes access to government support (λ_i = 1 if a household receives government support and 0 otherwise).

Two assumptions are required when assessing the treatment effects based on propensity score. The first one is the conditional independence assumption (CIA). Conditional independence assumption involves common variables that affect the treatment assignment and a treatment specific outcome becomes noticeable (Donkor *et al*., 2016). They further explained that the dependence between treatment assignment and treatment exact outcome could be removed by conditioning on the observable. Following on, the second assumption states that the average treatment effect for the treated average treatment effect (ATT) is only defined within the area of mutual sustenance. According to Heckman *et al*. (1998), this statement ensures that individuals with the same Z characteristics values have a positive probability of being both beneficiaries and non-beneficiaries of government support. The second stage involves the estimation of the average treatment affect (ATT), based on the propensity score. Empirically the equation is expressed as:

$$ATT = E\{W_{Ben} - W_{Non-Ben} \mid \lambda = 1\} \quad (5)$$

$$ATT = E[E\{W_{Ben} \mid \lambda = 1, W(Z)\} - E\{W_{Non-Ben} \mid \lambda = 0, W(Z)\} \mid \lambda = 1] \quad (6)$$

Where W_{Ben} is the welfare of beneficiaries and $W_{Non-Ben}$ is the welfare of non-beneficiaries. A number of methods have been suggested in the literature to match similar participants and non-participants. The most frequently used methods are the nearest neighbor matching (NNM), Kernel-based (KBM) and radius approaches. In this study, the nearest neighbor and Kernel-based matching approaches were employed.

3.5.2.1. Nearest neighbor matching

Thavaneswaran and Lix (2008) indicated that nearest neighbor matching measures the changes between propensity scores for the control and treatment group, which are minimised. They further stated that the control and treatment techniques are erratically well-ordered, where the first treated subject is carefully chosen along with a control subject and a propensity score next in significance to it. Nearest neighbor matching is more applicable when dealing with an enormous control data set (Baser, 2006).

3.5.2.2. Kernel-Based Matching

According to (Li, 2012), Kernel-based matching is a non-parametric technique, where every treated subject is matched with the weighted average of the control subject. Li further stated that the weights are inversely proportional to the distance between the treated and control groups propensity. The following section describes the variables used in this study.

The first sets of variables used in the analysis are socio-economic variables of age, gender of household head, household size, employment, salary and 'new-edu' (education). The next set of variables measured households assets, based on a range of assets owned by households. The choice of assets depends on household income. These household durable items include: radio, television, dvd player, motor vehicle, motorcycle, computer and Washing machine. The values of the household and total production from the household which indicate agricultural wealth were also considered as part of the household assets. The last set of variable are based on institutional factors (government support) which include RDP support, subsidised house, medication, access to piped water, access to electricity, free electricity, and social grants. These variables measure households' access to government-based services as well as the basic needs for the households.

3.5.3. Description of Variables Included in the Households' Change in Welfare of the Study Area

The next section presents the hypothesised determinants of change in welfare for low and middle income households. The expected signs and the description of variables are also included in tables. The socio-economic variables are described in the next section.

Table 3.5 presents descriptions of the determinants of government support on the welfare of low and middle income households. The expected signs and the description of the variables are also included in the table. The tables are divided into socio-economic variables, household's assets and institutional factors (government support).

Table 3.5: Description of Socio-Economic Variables and their a priori Expectations

Variable definition	Description	Expected signs
Age	The age of household head	+/-
Gender	Gender of household head 1 if male,0 if female	+/-
Education	Highest level of education 1 if yes, 0 if No	+/-
New-edu1	No formal education attained	-
New_edu11	Grade10 / standard 8 was attained 1if yes,0 if No	-
New_edu14	Grade12/standard10 (No university exemption)	+/-
New_edu15	Grade12/standard10 with university exemption)	+
Hsize	Number of people in the household	-
Employment	Employment status 1 if yes,0 if No	+/-
Salary/wages	Monthly income 1 if yes, 0 if No	+/-

Age is expected to have a positive and negative sign for the socio-economic variables. The reason for this is that as age increases, people ultimately cannot work anymore and many can only rely on pension fund payments or social grant payments, which are not sufficient to take care of all their households' basic needs, which can lead to low standards of living and poor household welfare. Younger people are expected to have lower welfare relative older people. Walker (1992) noted that an ageing population is of great concern to policy makers because it is assumed that with increasing numbers of older people in society, their increased life expectancy places great pressure on state resources, particularly in respect of healthcare expenditure and social security systems.

Gender is expected to have either a positive or negative influence on a household's welfare, depending on whether the household head is a male or female. This is because a widely recognised disproportionate number of poor people are females. More females are economically deprived because the majority of females are employed in the labour force for fewer years than males are, and these results in females receiving lower benefits from occupational schemes, compared with males. Therefore, households that are headed by females can experience low levels of welfare than households that are headed by males do. In terms of production input most males have more access than females.

Education is expected to have a positive effect on a household's welfare in Limpopo. This is because as the educational level of household heads or members increases, they tend to be employed and they can improve their household's standard of living since they have good paying jobs. All things being equal, people with higher education qualifications are expected to have high incomes or salaries and can afford a better standard of living and thus improve their household's welfare.

Household can either positively or negatively influence a household's welfare. This is because large households require higher incomes to meet all their household's basic needs than a small family size household would. This can lead to larger family size households having low levels of welfare and not being able to improve their standard of living, while a small family size household might have a better welfare.

Employment is expected to have a positive influence on household welfare. This is because if household members are employed, they are able to improve their standard of living; for example, children can be sent to school. If the children are being educated, this can lead to improved household standard of living, which influences household welfare positively. Employment is hypothesised to have a negative effect on household welfare. The reason for this is that if household members are not employed, they face low standards of living and

they cannot afford to take their children to school and improve their welfare, which influences their welfare negatively.

Salary is expected to have a negative effect on the welfare of low and middle income households. This is because low income households will have low standards of living, which influence their welfare negatively. Salary is hypothesised to have a positive influence because households that have high incomes would have improved standards of living, which influence their household's welfare positively. The next set of variables measures access to natural and physical capital, as well as household wealth.

Ten (10) explanatory variables were included in multinomial logit model. The description of changes in welfare variables, together with their expected signs, are summarised in Table 3.6. The positive signs of change of the variables in the welfare of the households indicate that the associated variables increase the welfare of the households, while the negative signs imply that the variables reduce welfare. Since the model used change in welfare as a dependent variable, it is expected that variables with a negative sign would decrease changes in welfare, while the variables with positive signs would increase changes in the welfare of low and middle income households in the study area.

Table 3.6: Description of Household's Assets Variables and their a priori Expectations

Variable definition	Description	Expected signs
lnpr	Own production 1 if yes,0 if No	+
Inhsevalue	The value of the house	+/-
Radio	1 if yes,0 if No	+
Television	1 if yes, 0 if No	+
Dvdplayer	1if yes, 0 if No	+
Motorvehicle	1 if yes 0if No	+
Motorcycle	1 if yes 0 if No	+
Computer	1 if yes, 0 if No	+
Washingmachine	1 if yes, 0 if No	+
Grant	Receive Social welfare 1 if yes, 0 if No	+

Six (6) explanatory variables were included in the welfare model. The description of the change in welfare variables, together with their expected signs, are summarised in Table 3.7. Positive signs of the variables of change in welfare imply that these institutional factors will increase welfare of low and middle income households in the study area.

Table 3.7: Description of Institutional Variables and their a priori Expectations

Variable definition	Description	Expected signs
Rdp_support	Reconstruction development programme 1 if yes,0 if No	+
Subsidized_hse	State subsidized housed 1 if yes, 0 if No	+
Access_pipewater	Access to pipe water1 if yes, 0 if No	+
Access_electricity	Access to electricity1 if yes, 0 if No	+
Free electricity	Receive free electricity 1 if yes, 0 if No	+
Medication	Acquired medication, paid for cash/received free medication 1 if yes, 0 if No	+/-

3.6. Summary and Conclusion

The summary of chapter three is provided in this section. In terms of basic needs provided to low and middle income households by government, many households had no access to government support programmes that might improve their welfare and reduce poverty. The majority of households in the study area lack access to basic services such as fresh drinking water, housing, and electricity.

Most of the households in the study area are headed by males. Furthermore, many of the households in Limpopo are situated in traditional, rural, areas, rather than in urban areas. Generally, there were low educational levels among low and middle income households. The majority of individuals in the households do not have access to education. The study also revealed that older people dominate low and middle income households, compared with high income households, and the high income households had more young individuals than those of low and middle income households. Even though the household sizes in Limpopo province were very close between the income groups, the middle and high income households had relatively high household sizes compared to low income.

4. CHAPTER FOUR: RESULTS AND DISCUSSIONS

Introduction

The results of the analyses that were performed to achieve the objectives of the study are presented and discussed in this chapter. The results of the impacts of government support on the determinants of a household's welfare are presented and discussed in section 4.1. In section 4.2, the results of the analyses on the impacts of various government support services in study area are presented and discussed. This is followed by major conclusion from the analysis done.

4.2. The Determinants of Government Support for Household Welfare in the Study Area

This section presents the results concerning the determinants of welfare for low and middle income households in the study area. The results are presented in Table 4.1. The estimates presented in Table 4.1 are the results of multivariate multiple regression analysis. This model was used because there was more than one predictor variable in the multivariate regression. The results were estimated for low, middle and high income groups. It must be emphasised that the very high income group was used as the reference category since the focus of the study was not on the very high income class. The next section discusses the determinants of household welfare for the low income category.

4.2.1. Low Income Households

The empirical results in Table 4.1 show that among the socio-economic factors, household size has a negative effect on the welfare of low income households in the study area. This is shown by the significantly negative coefficient of 0.942 at 1 percent level. The negative effect of household size on low income households implies that as the household size increases, their welfare decreases. Large households have greater basic needs, and as such, they require a high income to attain a high standard of living and better welfare. The results are supported by the findings of Orbeta (2005) who found that household size has a clear, negative impact on household welfare. Educational variables such as Grade12/standard10 (no university exemption New_edu14) and Grade12/standard10 (with university exemption New_edu15) are significantly different from zero and negative, as was expected. This finding implies that household heads with these levels education have low levels of welfare among the low income households in Limpopo, relative to those who have had university education. This is because a higher educational qualification can help the person to get a job, receive

better income and have a better living standard, which improves the welfare of the household. This is supported by the findings of Branson *et al*. (2009) who also found that holders of matric and post-secondary education certificates have better chances of getting into the job market.

In terms of assets ownership, the results revealed that ownership of assets, such as televisions, motor vehicles, and motor cycles, has a significantly negative impact on the welfare of households in the lower income category in Limpopo province. This is indicated by the significantly negative coefficients of the variables television, motorcycle and motor vehicle, at 1 percent level. The negative impacts of these assets might be the result of the costs associated with maintenance, fuel and other costs incurred to retain these assets. However, ownership of assets, such as a DVD player, which do not require much cost or extra bills to maintain them, has a positive effect on the welfare of low income households. Households that have their own means of production in the form of subsistence farming have improved welfare, relative to those who do not have any food production sources. This is indicated by the highly significant coefficient estimate of own production (lnpr). This suggests that in order to improve the welfare of low income households, there is a need to encourage people to engage in subsistence farming or have their own food production sources.

Among the government support variables, the results indicate that RDP_Support (Rdpsupport) and government subsidised houses (Subsidized_hse) have significantly positive effect on the welfare of households in the low income category in Limpopo province. This is indicated by the significantly positive coefficient estimates of subsidised houses (Subsidized_hse) variables at 10 percent and 1 percent levels, respectively. The implication of these results is that low income households that receive government support of free houses are more likely to have improved living standards and increases in welfare than households that do not receive RDP houses. The results further imply that as government support in the form of subsidised houses for low income group increases, their welfare is improved. These results are consistent with the findings of Mayo and Gross (1987).

Table 4.1: Determinants of Household Welfare in Limpopo Province

Variables	**Low income**	**Middle income**	**High income**
Socio-economic			
Constant	7.040(3.168)	10.270(2.480)	8.780(1.205)
Age	0.026 (0.018)	-0.025(0.018)	-0.035***(0.008)
Gender	0.188(0.585)	-0.595(0.518)	-0.757***(0.215)
Hsize	-0.942 ***(0.256)	-0.376***(0.143)	-0.197***(0.061)
New_edu 1	0.399(0.835)	-0.091(1.139)	-0.748*(0.427)
New_edu11	-0.979(0.899)	-0.235(0.864)	-0.139(0.274)
New_edu 14	-15.245***(0.978)	0.705(0.625)	-0.937**(0.430)
New_edu 15	-13.843***(0.879)	0.948(1.614)	-15.120***(0.465)
Employment	0.379(0.989)	1.169***(0.385)	-0.719(0.241)
Salary	0.820(0.975)	1.170**(0.463)	1.302***(0.393)
Assets			
Radio	-0.749(0.552)	-0.809(0.513)	0.155(0.207)
Television	-1.980***(0.631)	-1.122**(0.55)	-1.027***(0.239)
Dvd player	0.996* (0.555)	-0.633(0.570)	-0.390(0.244)
Motorvehicle	-14.399***(0.843)	0.255(0.807)	0.215(0.444)
Motorcycle	-12.765***(1.094)	2.592**(1.250)	13.330***(0.649)
Computer	1.503(1.163)	-0.048(0.844)	-1.076(0.725)
Washingmachine	-1.053(1.391)	-1.092(1.025)	-0.856*(0.457)
Hsevalue	0.4042(0.196)	0.357**(0.161)	0.393***(0.064)
Inpr	0.460***(0.154)	0.574***(0.152)	0.384***(0.083)
Government Support			
RDP_Support	0.979*(0.561)	0.221(0.602)	0.302(0.235)
Subsidized_hse	14.052***(0.725)	0.138(1.249)	0.213(0.522)
Medication	-1.079(0.674)	0.128***(0.425)	-0.128(0.425)
Access_Pipewater	0.371(0.438)	0.403(0.463)	0.080(0.272)
Access_electricity	0.780(0.688)	-0.374(0.803)	0.204(0.335)
Freeelectricity	-0.755(0.573)	0.748(0.562)	0.289(0.222)
Social grant	2.430***(0.857)	2.133***(0.721)	0.719***(0.241)
Diagnostic Statistics			
Observations	1892		
Wald-Chi-Square	11538.95***		
Log-likelihood	-534.24		
Pseudo R^2	0.24		

*' **' *** indicate significance at 10 %, 5 % and 1 % levels

Access to social welfare (grants) does have the expected positive sign for low income households and is statistically significant at 1 percent level. The positive sign for social welfare grants suggests that low income households that have access to social welfare (grants) tend to have improved welfare, compared with households that do not receive social welfare. This suggests that the social welfare grants should be extended to the majority of the poor people in the low income category. This result conforms to the findings of Woolard

and Klasen (2010). The next discussion focuses on middle income households in the study area.

4.2.2. Middle Income Group

For the middle income group, the results show that household size has a negative effect on the welfare of households in this category. This is shown by the significantly negative coefficient of -0.376 at 1 percent level. This implies that the welfare of middle income households with low household sizes are better off than those with large household size, ceteris paribus. Arthur (2005) found that a large household size has implications for the quality of life and the ability of household heads to cater for the needs of their families. Arthur (2005) explained further that large household sizes result in adverse implications for low income, low levels of education, poor health and nutrition. Besides household size, the results show that being formally employed and receiving a monthly salary impact positively on the welfare of households in the middle income category in Limpopo province. This is indicated by the significantly positive coefficient estimates of employment and salary variables at 1 percent and 5 percent levels, respectively.

Among the household assets, the results show that ownership of a television has a significantly negative impact on household welfare, as shown by the significantly negative coefficient of 1.122 at 10 percent level. The reason for this might be the monthly subscription that households pay to gain access to pay-for-view channels like Super Sport and other international channels. The results in Table 4.1 further indicate that the ownership of motor cycle, value of house (Hsevalue) and own production (Inpr) have positive impacts on the welfare of households in the middle income category.

In terms of support services, the results show that people who receive free medication (medication) and social welfare (grant) gain welfare improvements, relative to those who did not have access to such support services. This result is consistent with the findings of Woolard and Klasen (2010).

4.2.3. High Income Group

For the high income group, the results in Table 4.1 \indicate that socio-economic variables, such as age, gender, household size, and education levels (New_edu 1; New_edu 14; and New_edu 15), have significantly negative impacts on the welfare of high income households in Limpopo province. Specifically, the results show that age has significantly negative coefficient of 0.035 at 1 percent level. This suggests that as the age of people increases

their welfare reduces, all things being equal, in the high income category. The result is supported by the findings of Stats SA (2014) who found that older people in South Africa are poorer than those who are not. The significantly negative coefficient of gender shows that the welfare of male household heads is lower, relative to females. This is due to changes in demographic patterns and union formation, with regards to the rise in cohabitation, divorce and also a number of single fathers has increased in the last decades. Similar to the other income categories, the household size variable has a negative effect on the welfare of households in the high income category. This result is consistent with the findings of Arthur (2005). No formal education (New_edu1) and educational levels such as Grade12/standard10 (no university exemption New_edu14) and Grade12/standard10 (with university exemption New_edu15) are significantly different from zero and negative, as expected. This is because household heads with no formal education or who have low levels of education are expected to experience low welfare among the high income households in Limpopo, relative to those who have had university education, which is a finding supported by that of UNRISD (2010) which found that there is crucial connection between education and welfare in society. Having a source of salary was found to have a positive impact on the welfare of households within the high income category.

Regarding assets, the results show that ownership of a television and washing machine impacts negatively on the welfare of households in the high income category. Additionally, ownership of a motorcycle was found to have a significantly positive impact on the welfare high income households in the Limpopo province.

Households that have their own means of production (lnpr) in a form of subsistence farming have improved welfare, relative to those who do not have any food production sources. This is indicated by the highly significant coefficient estimate for lnpr. The implication of this result is that households that produce their own agricultural products as part of subsistence or commercial farming are more likely to improve their standard of living and have high levels of welfare, which is a finding supported by the results of Zezza *et al*. (2008). They found, across a section of developing countries that own production among other things improves a household's standard of living. The value of a house (Hsevalue) has a positive impact on the welfare of a household in the high income category. The positive effect of household value on welfare implies that as the value of the house increases, welfare increases for high income households.

In terms of government support, the results show that only social welfare (grant) is significantly and positively related to the welfare of high income households. The results

imply that households that receive social welfare (grant) tend to have improved household welfare, compared with households that do not receive grants. Comparing the magnitude of the social grants to low income groups with middle and high income groups, the results imply that low income households that receive social grants enjoy higher welfare improvements, relative to the other groups. These findings are consistent with the results of Woolard and Klasen (2010) who found that social welfare provides households with income transfer and also reduces poverty. The log-likelihood test and the significant chi-square indicate that the model is a good fit. The chi-square value of 11538.95 was highly significant, at the 1 percent level. The estimated Pseudo R^2 value for the model is 0.24. The next section presents the discussion of the precise impacts of government support services on the welfare of different income groups.

4.3. The Impact of Government Support on Households in Limpopo

The real impact of the various government support services are presented in Tables 4.2 to 4.4.The results are from Propensity Score Matching estimations using nearest neighbor and Kernel-based matching algorithms. The impacts of the various support services are presented separately for different income categories. The results in Table 4.2 are for the low income category of respondents.

Table 4.2: Impact of Government Support on Low Income Category of Respondents

	Beneficiaries	Non-beneficiaries	ATT	T-values	% change
Matching algorithms	*Social Grant*				
Nearest neighbor	8.10	8.04	0.06	0.32	0.75
Kernel-based	7.91	7.89	0.02	0.15	0.13
	RDP support				
Nearest neighbor	7.90	7.59	0.31	3.14*	3.92
Kernel-based	7.85	7.57	0.28	3.89*	3.57
		Free Electricity			
Nearest neighbor	8.80	7.90	0.18	2.12*	2.28
Kernel-based	7.87	7.76	0.11	1.86*	1.42
		Free Water			
Nearest neighbor	8.95	8.67	0.28	2.34*	3.23
Kernel-based	8.33	7.88	0.45	5.70*	5.71
		Subsidy repayment			
Nearest neighbor	9.97	9.54	0.43	1.78*	4.51
Kernel-based	9.41	7.84	1.57	3.32**	20.02
		Subsidised_hse			
Nearest neighbor	8.64	8.00	0.64	3.91**	8
Kernel-based	7.95	7.62	0.32	2.62*	4.33

Source: Author's calculation; * denotes 1 % significance level;**

ATT = average treatment effect

4.3.1. Low Income Households

For social grants, the results revealed that the causal impact of having access to social grants was an increase in welfare by 0.06 and 0.02 percent for the nearest neighbor and Kernel-based matching principles, respectively, among the low income group. These increases in welfare were found to be insignificant as shown by the t-values. In terms of RDP support, the results show that there are significant impacts for beneficiaries. In terms of percentage change, the results indicate that the adoption of social welfare (grant) results in about a 0.75 percent increase in welfare from nearest neighbor matching (NNM) algorithm and a 0.13 increase in welfare from Kernel-based matching (KBM) algorithm. The findings suggest that adoption of social welfare (grant) could improve the welfare of low income households, which is a finding supported by the results of Woolard and Klasen (2010) who found that social welfare provides households with income transfer and improves welfare.

The causal impact of receiving Reconstruction and Development Programme (RDP) support is an increase in welfare of beneficiaries by 0.31 and 0.28 percent for the nearest neighbor and Kernel-based matching principles, respectively, among the low income group in Limpopo. In terms of percentage changes, the results indicate that there are about 3.92 and 3.57 percentage changes in the welfare of low income households. This result is consistent with the results of Mayo and Gross (1987).

For access to free electricity, the results of the average treatment effect (ATT) on the treated indicate that there are significantly positive impacts for free electricity on the welfare of households in the low income category, as shown by a significant average treatment effect (ATT) values of 0.18 and 0.11 for the nearest neighbor and Kernel-based matching principles, respectively, at 10 per cent levels. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiaries is 8.80 and that of non-beneficiaries is 7.90. According to the Kernel-based matching (KBM) algorithm, beneficiaries obtain welfare improvement of 7.87, while that of non-beneficiaries is 7.76. However, in terms of percentage change, the adoption of a free electricity system by government results in minimal welfare increases of 2.28 and 1.42 from (NNM) algorithm and Kernel-based matching (KBM) algorithms, respectively. The results are supported by the findings of the World Bank (2008) which found that electricity greatly improves the quality of life and a household's welfare.

For access to free water, the results of the average treatment effect (ATT) on the treated indicate that there are significantly positive impacts for receiving free piped water on the

welfare of households in the low income category, as shown by a significant average treatment effect (ATT) values of 0.28 and 0.45 for the nearest neighbor and Kernel-based matching principles, respectively, at 10 percent levels. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiaries was 8.95 and that of non-beneficiaries is 8.67. According to the Kernel-based matching (KBM) algorithm, beneficiaries obtain a welfare improvement of 8.33, while that for non-beneficiaries is 7.88. However, in terms of percentage change, the adoption of a free water system by government results in minimal welfare increases of 3.23 and 5.71 from the nearest neighbor (NNM) algorithm and the Kernel-based matching (KBM) algorithm, respectively. The result is consistent with the results of Mangyo (2008).

Regarding subsidy repayments, the causal impact of benefiting from this support service is a significantly positive increase in welfare, as indicated by significant average treatment effect (ATT) values of 0.43 and 1.57 for the nearest neighbor and Kernel-based matching principles, respectively, at 10 percent and 5 percent levels. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiaries was 9.97, while that of non-beneficiaries is 9.54. From the Kernel-based matching (KBM) algorithm, beneficiaries obtain a welfare improvement of 9.41, while that for non-beneficiaries is 7.84. However, in terms of percentage change, the adoption of subsidy repayment method by government results in moderate welfare increases of 4.51 and 20.02 from nearest neighbor (NNM) algorithm and kernel based matching (KBM) algorithm, respectively. The percentage increase in welfare from the Kernel-based algorithm was the highest among all the support services.

Regarding subsidised houses, the causal impact of benefiting from this support service is a significantly positive increase in welfare, as indicated by significant average treatment effect (ATT) values of 0.64 and 0.32 for the nearest neighbor and Kernel-based matching principles, respectively, at 5 percent and 10 percent levels. This result is consistent with the findings of Mayo and Gross (1987). Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiaries is 8.64 and that of non-beneficiaries is 8.00. From the Kernel-based matching (KBM) algorithm, beneficiaries obtain a welfare improvement of 7.95, while that for non-beneficiaries is 7.62. However, in terms of percentage change, the adoption of a subsidy repayment method by government results in moderate welfare increases of 8 and 4.33 from nearest neighbor (NNM) algorithm and Kernel-based matching (KBM) algorithm, respectively.

4.3.2. Middle Income Households

The results of the average treatment on the treated (ATT) from the Propensity Score Matching estimations using nearest neighbor and Kernel-based matching algorithms are presented in Table 4.3. Generally, the results reveal positive and negative impacts of the various government support services on the welfare of middle income households in the study area.

For social welfare grants among the middle income households, the results of the average treatment effect (ATT) on the treated indicate that there are no significant impacts of social welfare grants on the welfare of households in this income category, as shown by insignificant average treatment effects (ATT) of 0.17 and 0.12 for the nearest neighbor and Kernel-based matching principles, respectively. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiary households was 8.10 and that of non-beneficiaries is 7.92. From the Kernel-based matching (KBM) algorithm, beneficiary households obtain welfare improvement of 7.90, while that for non-beneficiaries is 7.78. Similarly, in terms of percentage change, the use of social welfare grants by government results in minimal welfare changes of 2.27 and 1.54 from the nearest neighbor (NNM) algorithm and the Kernel-based matching (KBM) algorithm, respectively. This result is consistent with the findings of Woolard and Klasen (2010).

Regarding Reconstruction and Development Programme (RDP) support among the middle income households, the causal impacts of middle income households receiving RDP support are significant reductions in their welfare by 0.33 and 0.22 for the nearest neighbor and Kernel-based matching principles, respectively, at 10 percent level. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiary households is 7.59 and that of non-beneficiaries is 7.92. According to the Kernel-based matching (KBM) algorithm, beneficiary households obtain welfare improvement of 7.59, while that of non-beneficiaries is 7.81. Similarly, in terms of percentage change, the implementation of the Reconstruction and Development Programme (RDP) by government results in minimal welfare reductions of 4.17 and 2.82 from the nearest neighbor (NNM) algorithm and the Kernel-based matching (KBM) algorithm, respectively.

For access to free electricity, the results of the average treatment effect (ATT) on the treated indicate that there are significantly negative impacts of free electricity on the welfare of households in the middle income category, as shown by significant average treatment effect (ATT) values of 0.18 for the nearest neighbor matching (NNM) principle, respectively at 10 per cent levels. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiaries is 7.90 and that of non-beneficiaries is 8.09.

Table 4.3: Impact of Government Support on Middle Income Category of Respondents

	Beneficiaries	Non-beneficiaries	ATT	T-values	% change
Matching algorithms	*Social Grant*				
Nearest neighbor	8.10	7.92	0.17	1.53	2.27
Kernel-based	7.90	7.78	0.12	1.60	1.54
	RDP support				
Nearest neighbor	7.59	7.92	-0.33	-2.94*	-4.17
Kernel-based	7.59	7.81	-0.22	-3.16*	-2.82
		Free Electricity			
Nearest neighbor	7.90	8.09	-0.18	-2.35*	-2.35
Kernel-based	7.76	7.86	-0.09	-1.64	-1.27
		Pay Water			
Nearest neighbor	8.96	8.62	0.34	2.76*	3.94
Kernel-based	8.40	7.88	0.51	6.44**	6.59
		Subsidy repayment			
Nearest neighbor	9.97	9.73	0.24	1.19	2.47
Kernel-based	9.41	8.53	0.87	1.90*	10.32
		Subsidised_hse			
Nearest neighbor	8.64	7.90	0.75	3.11**	9.36
Kernel-based	7.95	7.36	0.59	2.17**	8.02

Source: Author's calculation; * denotes 1 % significance level;**

ATT = average treatment effect

According to the Kernel-based matching (KBM) algorithm, beneficiaries obtain a welfare improvement of 7.76 and that of non-beneficiaries is 7.86, with a mean difference of 0.09, although this is insignificant at the conventional levels. In terms of percentage change, the adoption of a free electricity system by government results in minimal welfare reduction of 2.35 and 1.27 from the nearest neighbor matching (NNM) algorithm and the Kernel-based matching (KBM) algorithm, respectively.

Concerning access to free water, the results of the average treatment effect (ATT) on the treated indicate that there are significantly positive impacts for free piped water on the welfare of households in the middle income category, as shown by significant average treatment effect (ATT) values of 0.34 and 0.51 for the nearest neighbor and Kernel-based matching principles, respectively, at 10 and 5 percent levels. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiaries is 8.96 and that of non-beneficiaries is 8.62. According to the Kernel-based matching (KBM) algorithm, beneficiaries

obtain a welfare improvement of 8.40, while that for non-beneficiaries is 7.88. However, in terms of percentage change, the adoption of a free water system by government results in minimal welfare increases of 3.94 and 6.59 from the nearest neighbor (NNM) algorithm and Kernel-based matching (KBM) algorithm, respectively. This finding is consistent with the results of UNICEF and WHO (2006).

Regarding subsidy repayment, the causal impacts of benefiting from this support service are significantly positive increases in welfare as indicated by significant average treatment effect (ATT) values of 0.87 for the Kernel-based matching principle, respectively at 10 per cent level. According to the Kernel-based matching (KBM) algorithm, beneficiaries obtain a welfare improvement of 9.41, while that for non-beneficiaries is 8.53. However, in terms of percentage change, the adoption of a subsidy repayment method by government results in a moderate welfare increase of 10.32 from the Kernel-based matching (KBM) algorithm. This percentage increase in welfare according to the Kernel-based algorithm was the highest among all the support services.

Regarding subsidised houses, the causal impacts of benefiting from this support service are significantly positive increases in welfare, as indicated by significant average treatment effect (ATT) values of 0.75 and 0.59 for the nearest neighbor and Kernel-based matching principles, respectively, at 5 percent level. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiaries is 8.64 and that of non-beneficiaries is 7.90, which is a finding supported by Galtung (1978) who found that subsidised houses improve the standard of living. According to the Kernel-based matching (KBM) algorithm, beneficiaries obtain a welfare improvement of 7.95, while that of non-beneficiaries is 7.36. However, in terms of percentage change, the adoption of a subsidy repayment method by government results in moderate welfare increases of 9.36 and 8.02 according to the nearest neighbor (NNM) algorithm and the Kernel-based matching (KBM) algorithm, respectively.

4.3.3. High Income Households

The results from the Propensity Score Matching estimations using nearest neighbor and Kernel-based matching algorithms are presented in Table 4.4 for the high income households. For the high income households, the results show that social welfare grants did not have any significant impact. This is shown by the insignificant average treatment effects (ATT) for the nearest neighbor and Kernel-based matching principles. Concerning Reconstruction and Development Programme (RDP) support among the high income households, the causal impact of high income households receiving RDP support is an insignificant increase in their welfare by 0.07, according to the nearest neighbor (NNM)

algorithm. In terms of percentage change, the implementation of the Reconstruction and Development Programme (RDP) by government results in less than a one percent increase in welfare of high income households, using both matching principles.

Table 4.4: Impact of Government Support on High Income Category of Respondents

	Beneficiaries	Non-beneficiaries	ATT	T-values	% change
Matching algorithms	*Social Grant*				
Nearest neighbor	8.10	8.12	-0.02	-0.18	-0.25
Kernel-based	8.02	8.02	-0.00	-0.05	0
	RDP support				
Nearest neighbor	7.59	7.52	0.07	0.69	0.93
Kernel-based	7.59	7.58	0.00	0.03	0.13
		Free Electricity			
Nearest neighbor	7.90	7.95	-0.05	-0.55	-0.62
Kernel-based	7.84	7.82	-0.01	-0.24	0.25
		Free Water			
Nearest neighbor	8.96	8.70	0.26	2.36**	2.99
Kernel-based	8.54	8.16	0.38	4.77**	4.66
		Subsidy repayment			
Nearest neighbor	9.97	9.58	0.38	1.68*	4.07
Kernel-based	9.83	9.36	0.47	1.69*	5.02
		Subsidised_hse			
Nearest neighbor	8.65	7.96	0.68	3.05**	8.67
Kernel-based	7.95	7.85	0.09	1.19	1.27

Source: Author's calculation; * denotes 1 % significance level;**

ATT = average treatment effect

Similarly, access to free electricity had an insignificantly negative impact on the welfare of households in the high income category, as shown by the insignificant average treatment effect (ATT) values of 0.05 and 0.01 for the nearest neighbor and Kernel-based matching principles, respectively. The percentage change in welfare resulting from the free electricity system implemented by the government is a minimal welfare reduction of less than 1 per cent according to both matching algorithms.

For access to free water, the results of the average treatment effect (ATT) on the treated indicate that there are significantly positive impacts for free piped water on the welfare of households in the high income category, as shown by significant average treatment effect (ATT) values of 0.26 and 0.38 for the nearest neighbor and Kernel-based matching

principles, respectively, at 5 percent levels. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiaries is 8.96 and that of non-beneficiaries is 8.70. According to the Kernel-based matching (KBM) algorithm, beneficiaries obtain a welfare improvement of 8.54, while that for non-beneficiaries is 8.16. However, in terms of percentage change, the adoption of a free water system by government results in minimal welfare increases of 2.99 and 4.66 according to the nearest neighbor (NNM) algorithm and Kernel-based matching (KBM) algorithm, respectively. This finding is supported by the findings of UNICEF and WHO (2006) which found that access to fresh water influences households' welfare and the quality of life.

Regarding subsidy repayment, the causal impacts of benefiting from this support service are significantly positive increases in welfare as indicated by significant average treatment effect (ATT) values of 0.38 and 0.47 for the nearest neighbor and Kernel-based matching principles, respectively, at 10 percent levels. Percentage-wise, the implementation of a subsidy repayment method by government results in only 4.07 and 5.02 welfare increases according to the nearest neighbor and kernel based matching (KBM) algorithms, respectively.

Regarding subsidised houses, the causal impact of benefiting from this support service is a significantly positive increase in welfare as indicated by a significant average treatment effect (ATT) value of 0.68 according to the nearest neighbor matching principle, at 5 percent level. Specifically for the nearest neighbor matching (NNM) algorithm, the welfare of beneficiaries is 8.65, while that for non-beneficiaries is 7.96. However, in terms of percentage change, the adoption of this subsidy repayment method by government results in a moderate welfare increase of 8.67 according to the nearest neighbor (NNM) algorithm. This empirical finding coincides with that by Mayo and Gross (1987) who found that an increase in welfare significantly improves a household's standard of living.

4.4. Summary and Conclusion

The results for low and middle income households in Limpopo province indicate positive and negative influences of government support services on a household's welfare. The multivariate multiple regression estimates indicate that a low income group socio-economic variable such as household size is significant, with a negative coefficient of 0.942, while educational variables such as New edu-14 and New edu-15 are significant, at 1 percent level. In terms of asset ownership, television, motor vehicle, motor cycle and own production are significant at 1 percent level, and they have a negative coefficient, which might be due to

maintenance cost associated with these assets. The government support variables, such as RDP support, subsidised houses, and social welfare (grants), are also significant.

In the middle income category, household size has a negative effect on the welfare of households in this category, as shown by a negative coefficient of -0.376. The ownership of households assets, such as motor cycle, value of house (Hsevalue), and own production (Inpr) have a positive impact on welfare of households. In terms of government support services, the results show that people who receive free medication and social welfare (grants) gain welfare improvements, relative to those who do not have access to such support services.

For the high income category, age, gender, household size and education level (New edu1 New edu14 and New edu15) are significant socio-economic factors that influence household welfare in Limpopo Province. Regarding asset ownership, television, motor cycle, washing machine, household value, and own production (Inpr) are significant variables. Assets such as a television and a washing machine negatively influence households' welfare in Limpopo, whereas motorcycle, value of the house, and own production positively affect households of the study area. In terms of government support variables in the high income group, only social welfare (grants) positively affects households' welfare in high income households in the study area, and is significant.

In conclusion, the multivariate multiple regressions estimated for changes in welfare show that there is opportunity of improving households' welfare in low and middle income households in Limpopo province. Upon evaluation of the estimated multivariate multiple regression, it can be concluded that the standard of living in high income households is improved, compared to low and middle income households, in Limpopo province.

The results of the propensity score matching estimations were derived from the nearest neighbor and Kernel-based matching algorithms. RDP support, free electricity, free water, subsidy repayment and subsidised houses are significant factors that influence government support on households' welfare in Limpopo province. The results of average treatment effects on the treated from the propensity score matching estimations indicate positive significant impacts of government support on households' welfare. The results reveal that the casual impact of having access to social welfare increases households' standards of living by 0.06 and 0.02 percent, according to the nearest neighbor and Kernel-based matching algorithms, respectively, and the impact is statistically insignificant.

Generally, for middle income households, the results reveal positive and negative impacts of the various government support services on the welfare of middle income households in the study area. Social welfare is not significant, while RDP support, free electricity, free water, subsidy repayment, and subsidised houses are significant for middle income households. The estimated average treatment effect on the treated ATT of 0.17 and 0.12 according to the nearest neighbor and Kernel-based matching principles, respectively, indicate that there is no significant impact of social welfare on the welfare of middle income households.

Among the high income households in Limpopo province, free water, subsidy repayment and subsidised houses are significant, while social welfare (grants), RDP support and free electricity are not significant. The results of the propensity score matching estimation on the average treatment effect on the treated ATT for free water, subsidy repayment and subsidised house reveal positive impacts for the adoption of these variables on households' welfare. In conclusion, social welfare (grants) in all the income categories is insignificant, and it is common to all three income categories that a clear distinction exists among the factors influencing households' welfare in Limpopo province. It can be concluded from the results that low, middle and high income households experience different impacts from government support services on their households' welfare. Therefore, it is important to improve government support services, and specific information is necessary to improve a household's change in welfare, for all the income groups in the study area.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

Introduction

This chapter provides a summary of the study's findings, the conclusions arising from the findings, the policy implications and recommendations from the study. This chapter is divided into three sections. The first section presents the summary, followed by the conclusion and policy implications, respectively.

5.2. Summary

This study examined the impacts of government support programmes on low and middle income households in Limpopo province. The study used household survey data collected by Statistics South Africa. The data consisted of 3306 households, sampled from the Limpopo province. The survey data consisted of low, middle, high, and very high income classes. The sample size consisted of 111 low income, 121 middle income, 342 high income, and 2732 very high income households. The study focused on the low and middle income households.

The first objective was to analyse the socio-economic characteristics of low and middle income households in Limpopo. The important socio-economic factors identified to influence the welfare of low income households in Limpopo province include age levels, gender disparities, educational level, employment status, and income source (salary). This suggests that all government support programmes should pay attention to these demographics so as to improve households' standards of living and welfare. Similarly, for the middle income households, the results suggest that it is important, for all the households, to consider different age groups, gender differences, household sizes, educational levels, employment status, and income sources. Given the importance of these demographic characteristic factors, it is extremely important for government support programmes to consider them in future policies in the region.

For the individual, education is an important determinant of personal career and economic success, and income is one of the important factors that determine to some extent the well-being of households in Limpopo province. It is concluded that the welfare of Limpopo households depends mostly on socio-economic characteristics such as age, gender, household size, educational level, employment, and income. These imply that household

welfare can be predicted, based on the socio-economic demographics that exist in households. It is further concluded that socio-economic characteristics influence what positions the individuals or households hold within the structure of society.

The welfare of low and middle income households, which is impacted on more by government support programmes, is clearly a cause for concern. There is a significant erosion of real income in the low and middle income households. This reduces the ability of low and middle income households to afford basic needs, thus decreasing their prospects of escaping poverty for some time to come.

The second objective was to examine the determinants of the welfare of low and middle income households. A multivariate multiple regression model was used to estimate the factors that influence change in welfare in the households. The results show that changes in the welfare of low income households are determined by the size of their households, the level of education of the household head, the possession of households assets, such as a television, DVD player, motor vehicle, and a household's own production in a form of subsistence farming. Another factor is the receipt of benefits under government support programmes, such as the Reconstruction and Development Programme and subsidised housing.

For middle income households, the findings revealed that socio-economic factors, such as household size, being employed, and receiving monthly income (salary), are significant determinants of household welfare among middle income households. Additionally, household assets, such as a television and motor cycle; the value of the house; a household's own production in a form of subsistence farming; and medication support from government further influence the welfare of household members in the middle income category. Among the high income households, the result revealed statistically significant factors, such as age of household head, gender, household size, education level, and monthly income (salary) as well as households assets such as a television, motor cycle, washing machine, value of house, own production, and social welfare (grants).

Specifically, a larger household size produces a negative effect on the welfare of low income households in Limpopo province. This implies that as a low income household's size increases, the welfare of its member's decreases. The welfare of middle income households with low household sizes is improved than of large household sizes.

In terms of education, households headed by people with lesser formal education have low standard of living or welfare, relative to those that have attained university education. Higher education ensures higher income and better job opportunities. For the high income households, as the age of the household head increases, the welfare of its members reduces. This is due to the fact that older people in all settings are on average less likely to have paid employment compared to the younger ones. Therefore, older people often rely on income such as personal savings, pension funds, grants and supports from family members.

The welfare impact also varies according to the gender of the household head among the low and middle income households. The male-headed households are found to have low levels of welfare. This implies that not only do female-headed households have low levels of welfare in Limpopo, the male-headed households also do. A middle income household whose head is employed is more likely to have better living standard than a household where the household head is unemployed. The results show that being formally employed and receiving a monthly salary impacts positively on the welfare of households in the middle and high income categories in Limpopo province.

In terms of asset ownership, the results suggest that ownership of assets such as a television, motor vehicle, and motor cycle has negative impacts on the welfare of households in the lower income category in Limpopo province. Low and middle income households which have their own means of production in a form of subsistence farming experience improved welfare, relative to those who do not have any food production sources.

In terms of government support services, the results show that people in middle income households who receive free medication (medication) and social welfare (grants) have their welfare improved, relative to those who do not have access to such support services. Focusing on social welfare, the results are similar for low and middle income households. Hence, there is a need for improvements in government services relating to the provision of access to piped water, electricity and medication.

The third objective was to evaluate the magnitude and direction of the impacts of government support on the welfare of low and middle income households in Limpopo. The impacts of the various government support services were identified by Propensity Score Matching (PSM) estimations using the nearest neighbor and Kernel-based matching algorithms. For the low income households, the results indicate that the welfare of households in this category is significantly improved by participation in the Reconstruction

and Development Programme and gaining access to free electricity, free water, subsidy repayments and subsidised houses.

The empirical findings further revealed that government support programmes, such as the Reconstruction and Development Programme, free electricity, free water, subsidy repayments and subsidised houses, enhance the welfare of households in the middle income category.

For the high income households, the results show that government support services, such as free water, subsidy repayments and subsidised houses, significantly improve household welfare. Furthermore, access to subsidised houses and free water increase the standard of living for high income households in the study area. Households in the study area rely on social welfare (grants) and this variable is positive and statistically significant, at 1 per cent level, for all the income categories.

5.3. Conclusions

A number of studies have been conducted on households' welfare, but there is a lack of literature addressing the impact of government support on the welfare of low and middle income households. This study, therefore, determined the impact of government support on the household welfare of low and middle income households by analysing 3306 households in Limpopo province.

Based on the results of the study, the following conclusions are made. For the low income households and those with the least means to cope, it is concluded that their welfare is most likely to be low owing to low levels of education, large household sizes, and lack of employment. It is also concluded that gender disparities according to the head of a household impact on the welfare of households in the low income category. In terms of assets, the study concludes that ownership of assets, such as a television, motor vehicle, and motor cycle, has a significantly negative impact on the welfare of households in the lower income category. The negative impacts of these assets may be due to the costs associated with maintenance, monthly subscription fees, fuel and other costs associated with these assets. It is also concluded that having an own source of food production in a form of subsistence farming enhances the welfare of low income households. Regarding government support services, it is concluded that access to RDP support, social welfare grants and government subsidised houses impacts positively on the welfare of households in this income category in Limpopo province.

For the middle income category, it is concluded that a larger household size and the ownership of a television which attracts subscription fees reduce the welfare of households. Nonetheless, being formally employed and receiving a monthly salary enhances the welfare of households in the middle income category. It is further concluded that receiving access to free medication and social grants improves the welfare of households, and ownership of a motor cycle, value of house, and having own means of production enhances the welfare of households in the middle income category.

Generally, the study concludes that socio-economic factors, education levels, household's size, age, gender, employment and income sources are crucial factors that should be considered when assessing the impact of government intervention on household welfare. The magnitude and effects of these demographic characteristics vary across the different income groups, and is particularly high for low and middle income households, compared with the high income group.

Regardless of the income category, households with little education and larger household sizes are all found to be associated with low standards of living and welfare. Therefore, the study concludes that government support services are needed to promote households' welfare to achieve better standards of living. Regardless of the income category, the study concludes that having an own source of food production enhances the welfare of households. Besides own production, it is concluded that low income households that receive government services could improve their standard of living and gain positive changes in welfare.

Interestingly, low income households which own assets are found to be experiencing reduced welfare, instead of an improved standard of living. Accordingly, low income households might be using the little money that they receive to pay for and maintain the assets they acquire, with the result that their welfare is not improving.

They might also follow a strategy where they ask someone who earns more than they do to buy these assets for them, and they will then pay the instalments every month. This could lead to their reduced welfare since they have to work extra to maintain the household durables they acquire in this way. There are some exceptions, in that some middle income households gain from government support, although these cases appear to be linked to having access to services such as medication and social grants, which results in middle income household having a better standard of living. The study concludes that the

magnitude and impacts of government support on the welfare of households differ from one income class to another in Limpopo province.

The inference drawn from this study is that specific government support services, information and policies are required for households that access government support, and for those that do not have such access, to improve their standards of living in Limpopo province. Households differ in terms of their assets and enhancement since their household differing livelihood strategies yield additional important points, which could be very useful for implementing better informed policy responses.

5.4. Policy Implications and Recommendations for Future Research

From a policy perspective, these results have some clear implications. A proper understanding of the adoption and impacts of the government support services on households' welfare in the low and middle income categories is crucial for ensuring better standards of living and poverty reduction in Limpopo province. Despite the implementation of these government programmes, there is still a low service delivery in this study area.

The government should be prepared to implement safety nets and policies aimed at low and middle income households, as the impacts of government support on these households could have serious consequences in the short term, as well as in the long run, including on the prospects for escaping poverty. While high income households may cope with a lack of government services by reducing household expenditure, this is not a possibility for low and middle income households, as they end up cutting on essentials such as education enrolment for their children. This is especially true for low income households headed by males who are living in a state of extreme poverty, and government programmes have less impact on the state of their welfare.

Since low levels of education reduce the welfare of households, it is suggested that the Limpopo government's support programmes should also implement national government programmes, directed specifically to assists low income households with cash transfers or programmes that will encourage people to enrol their children in higher education. Given the finding that having an own source of food production enhances the welfare of households in all income categories, the study suggests that there should be a programme that encourages household participation in agricultural production or subsistence farming to

improve welfare. An example of such a programme comprises community or homestead food gardens.

It is recommended that government support services should focus on low and middle income households in Limpopo province with particular attention on RDP support, medication, access to fresh water, and access to electricity. The government should understand the real impact of these services on low and middle income households, and it is essential not to lose sight of the heterogeneity at the household level. This is because the impacts of the government support services differ from class to class, with some of the programmes not having any significant impact on the welfare of households in some income classes.

It is recommended that government support should consider the use of selective demographic targeting as a feasible strategy when designing livelihood improvement strategies for different income classes, as well as for sustaining government support programmes and their impact assessment. Since socio-demographics, assets, and support services significantly influence a household's welfare and standard of living, policy makers should pay particular attention to these factors.

Policy makers could channel government support services and should strive to gain a better understanding of the nature of the existing impacts of government support on the welfare of low and middle income households in Limpopo province. This has the potential to enhance interactions between policy makers and coordinators of government programmes by improving beneficiary targeting of the specific income groups with special needs and support.

It is recommended that future impact analyses of improved government support services adopted by government for the households in Limpopo province should consider accounting for endogeneity bias by applying appropriate methods to capture the real impacts of government support on welfare. An application of the reliable estimation and efficient estimation approaches would give true reflection of the contribution of newly introduced government support programmes.

Similar studies should be conducted in other provinces to compare the impact of government support on households' welfare of low and middle income households in those regions. This might result in new policies being implemented that would accurately target these income groups in all the provinces in South Africa. This study shows that the standard of living of male-headed households is low. This result is contrary to what was expected. It is therefore

important for future research to be carried out to investigate why male-headed households experience low welfare. This present study did not evaluate the social capital effect of households. It is suggested that future research should incorporate the effects of social capital for low and middle income households.

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