



University of Fort Hare
Together in Excellence

**Energy and Sustainable Development: The Case of Dewedzo Rural
Community in Zimbabwe.**

By

Mbulayi Shingirai P.

200910028

**Dissertation Submitted to the University of Fort Hare in Fulfillment of
the Requirements of the Masters in Social Science in Development
Studies.**

**Department of Development Studies
Faculty of Management and Commerce
University of Fort Hare
South Africa**

Supervisor: Prof. A. Rahim

Date: June 3 2014

Dedication

This thesis is a special dedication to my late mother, Ms. Veronica Mbulayi, who had been a source of strength and inspiration to my life. I also dedicate this work to my grandfather, Mr. Ruben Jonathan Mbulayi and my uncle Mr. Silas Sibanda who sponsored my education. I also dedicate this thesis to my wife Abigail Makuyana Mbulayi for her love, support and inspiration.

Acknowledgement

With all humility, I would like to acknowledge the Lord All Mighty God for his mercy, love, guidance, insights and the provision of both material and spiritual resources which enabled me to complete this thesis. This work is a hallmark of his endless mercy.

I would also like to express my deepest gratitude to my supervisor, Professor Aminur Rahim, for his excellent guidance, patience, and commitment which all contributed to the completion of this research. His dedication and commitment which saw him marking, and providing critical incites into the various versions of this thesis need to be acknowledged.

I would never have been able to finish this thesis without the encouragement of my colleges in the Department of Development Studies, help from friends, and support from my family and wife.

Lastly, I remain indebted to the entire community of Dewedzo whose support during the length of the data gathering process have humbled me.

Declaration

I Mbulayi Shingirai. P. hereby declare that the contents of this dissertation are my own original work. I have submitted this work to the University of for Hare for consideration for a Master's degree in Development Studies and will not be submitted to another academic institution for similar purposes. I authorize the University of Fort Hare to lend it to other institutes or individuals for the purpose of scholarly research.

A handwritten signature in black ink on a light grey rectangular background. The signature is stylized, starting with a large 'M' and 'S' that are connected, followed by a long horizontal stroke and a final 'P'.

.....

Signature Date

Abstract

Energy poverty is a concept that has gained significance quite recently. Its significance has been prompted by the realization that without sustainable modern energy alternatives for the rural poor, prospects for rural transformation remains low. The recognition of modern energy as one of the missing link in rural transformation comes amid the growing concern about the negative effects of relying on traditional energy services and the increasing forecasts that most developing countries are likely to miss their MDG targets by 2015.

Drawing on the Modernization and the Sustainable Development Approach, this study concluded that improving the quantity and quality of energy services consumed by the rural poor can counteract rural underdevelopment and enhance rural social and economic transformation in Dewedzo. The study confirmed that energy poor households are prone to various social, economic and environmental detriments such as poor health, hunger, malnutrition, poor education and missed socio economic opportunities. By addressing rural people's energy needs, more nexus can be injected into rural productivity and the economic social outputs of this process can in turn increase the pace at which MDGs can be achieved.

Table of Contents

Dedication.....	i
Acknowledgement.....	ii
Declaration.....	iii
Abstract	iv
List of Acronyms and Abbreviations.....	7
CHAPTER 1	1
Energy Poverty and the Millennium Development Goals.....	1
1.1. Introduction	1
1.2. Overview of Zimbabwe and Its Energy Sector	10
1.3. Problem Statement	16
1.4. Aim and Objectives of the Study.....	17
1.5. Significance of the Study	18
1.6. Research Methodology.....	20
1.7. Delimitations of the Study.....	22
1.8. Ethical Considerations	23
1.9. Framework of Chapters	25
1.9.1. Chapter one: General Overview of the study.....	25
1.9.2. Chapter two: Literature Review.....	25
1.9.3. Chapter three: Research Methodology.....	25
1.9.4. Chapter four: Research Findings and Discussion	25
1.9.5. Chapter 5: Summary of findings, Conclusions & Recommendations	25
CHAPTER 2	26
Theories on Energy and Sustainable Development	26
2.1. Introduction	26
2.2. Defining Development.....	28
2.3. The Modernization Theory.....	31
2.4. The Sustainable Development Approach.....	38
2.5. Towards a Theory of Energy and Sustainable Development	42
CHAPTER 3	50
Research Methodology	50

3.1. Introduction	50
3.2. Description of the Study Area	51
3.2.1. Geography	51
3.3. Population	53
3.3.1. Population Profile for Manicaland Province	55
3.3.2. People, Language, Religion and Culture	55
3.4. Road Infrastructure in Dewedzo	57
3.5. Communication Infrastructure	57
3.6. Health Facilities and Services in the Study Area.....	58
3.7. Education	59
3.8. Agriculture	59
3.9. Research Methodology	60
3.9.1. Research instruments and Research design.....	64
3.9.2. Sampling	65
3.9.3. Interviews.....	68
3.9.4. Secondary Data Review	70
3.9.5. Data Analysis.....	71
CHAPTER 4	73
Presentation and Discussion of Results	73
4.1. Introduction	73
4.2. Demographic Characteristics of the Study Area.....	74
4.2.1. Gender Stratification	74
4.2.2. Age	75
4.3. Educational Qualifications	78
4.4. Gender and Education	81
4.3. Energy and Development	82
4.3.1. Energy Services in Dewedzo	82
4.3.2. The Cost of Energy Services	84
4.3.3. The opportunity cost of Energy poverty.....	85
4.3.4. Energy and Productivity.....	86
4.3.4.1. Electricity and Productivity.....	87
4.3.4.2. Wood Fuel and Productivity	88

4.3.4.3. Solar Energy and Productivity.....	89
4.3.4.4. Cow dung and Productivity.....	90
4.3.2. Income and Energy in Development	91
4.3.2.1. Low Income Households and Energy Usage.....	93
4.3.2.2. Medium Income Households and Energy Usage	95
4.3.2.3. High Income Households and Energy Usage.....	95
4.3.3. Income as a Determinant of the Quality and Quantity of Energy for Households	96
4.3.4. Household Size and Energy.....	96
4.3.5. Energy Poverty and Access to Food	97
4.4. Women and Energy Poverty	100
4.5. Energy and Human Development.....	102
4.5.1. Information	103
4.5.2. Education	105
4.6. Government Intervention in the Fight against Energy Poverty.....	106
4.7. Agricultural Transformation and Rural Development	107
4.8. Energy and Health	109
Chapter 5	113
Summary of findings, Conclusions and Recommendations	113
5.1. Introduction	113
5.2. Summary of Findings and Conclusions.....	113
5.3. Government Initiatives to Reduce Rural Energy Poverty and Its Effects	118
5.4. Recommendations	119
5.4.1. Long Term Measures to Address Energy Poverty and its Allied Effects.....	119
5.4.2. Developing Alternative Sustainable Energy Services	120
5.4.3. Public-Private Partnerships (PPPs) in the Rural Energy Sector	120
5.4.4. Industrialization and Reindustrialization	121
5.4.5. Improving rural-urban linkages.....	122
5.4.6. Ensuring the Security of Energy Supply.....	122
5.4.7. Resettlement and Redesigning Rural Settlement Patterns	123
5.5. Short Term Measures to Reduce the Negative Impacts of Energy Poverty	123
5.5.1. Promote Food Crop Production	123
5.5.2. Devise Supplementary Nutritional Programmes for the Rural People	124

5.5.3. Solar Energy Lamps for Reading at Night	124
5.5.4. De-gendering rural communities through effective and Practical Policies	125
5.5.5. Empowering Women with Decision Making abilities and Ownership of Economic Resources	126
5.5.6. Increasing Educational Opportunities for Women and Girls.....	126
5.6. Concluding Remarks.....	127
5.7. Possible Areas for future Studies	128
6.1. Bibliography	129
Appendices.....	139
7.1. Appendix 1: Interview Guide	139
7.2Appendix 2: Ethical Clearance	146

List of Figures

Figure 1: Illustration of Africa as a Dark Continent	2
Figure 2: Energy Ladder: The Relationship between Different Energy Services and Development.....	4
Figure 3 Composition of Electricity Supply from Various Sources in Zimbabwe	11
Figure 4: Existing Energy Plants and Potential Sites in Zimbabwe.....	12
Figure 5: The Relationship between the Three Dimensions of Sustainability	40
Figure 6: Stages of Human Development and Energy Consumption	43
Figure 7: Districts of Manicaland with Makoni district and the Position of Dewedzo Shown	53
Figure 8: Map of Zimbabwe Showing Population Distribution, Manicaland Province is selected	54
Figure 9: Gender Stratification in Dewedzo.....	74
Figure 10: Age Distribution in Dewedzo	76
Figure 11: Educational Qualifications in Dewedzo	78
Figure 12: Distribution of Educational Between Males and Females.....	81
Figure 13: Perceptions of Sampled Households on the Impacts of Different Energy Services on Productivity.....	87
Figure 14: Impacts of Reliance on Wood Fuel and Biomass on Sustainable Development	89
Figure 15: Monthly Income Distribution in Dewedzo	92
Figure 16: Reasons for not Commercialising Agriculture in Dewedzo.....	108

List of Tables

Table 1: Energy Sources for the Sampled Households	83
Table 2: Approximated Monthly Cost of Energy Services for Sampled Households	84
Table 3: Household Expenditure on Various Energy Services in a Low Income Household.....	93
Table 4: Eating Frequencies per Day	98
Table 5: Dynamics of having meat in a meal among wood fuel users and Electricity users	99

List of Acronyms and Abbreviations

ADB	African Development Bank
AFREA	Africa Renewable Energy and Access
AGECC	Secretary-General's Advisory Group on Energy and Climate Change
BEAM	Basic Education Assistance Module
CIA	Central Intelligence Agency
CSO	Central Statistical Office
EEA	European Economic Area
EMA	Environmental Management Agency
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
IEA	International Energy Agency
IMF	International Monetary Fund
MDGs	Millennium Development Goals
NEP	National Energy Policy
OFID	OPEC Fund for International Development
REA	Rural Electrification Agency of Zimbabwe

REP	Rural Electrification Programme
RERA	Regional Electricity Regulatory Association
SADC	Southern African Development Committee
SPSS	Statistical Package for Social Sciences
U N	United Nations
UNDP	United Nations Development Plan
USA	United States of America
WB	World Bank
WEC	World Energy Council
WHO	World Health Organization
ZEDC	Zimbabwe Electricity Distribution Company
ZESA	Zimbabwe Electricity Supply Company
ZETCO	Zimbabwe Electricity Transmission Company
Zimstats	Zimbabwe National Statistics Agency
ZMEPD	Zimbabwe Ministry of Energy Power & Development
ZPC	Zimbabwe Power Company
ZERA	Zimbabwe Energy Regulatory Authority

CHAPTER 1

Energy Poverty and the Millennium Development Goals

1.1. Introduction

At least 1.3 billion people in the world have no access to electricity and more than 2.6 billion rely on biomass to satisfy their energy needs (International Energy Agency (IEA) 2013). The majority of energy poor people are domiciled in the rural areas of African and Asian countries where they rely on unsustainable energy services. Because of its very low rates of electrification, Africa has been labeled as the Dark Continent. Despite being richly endowed with vast energy resources, most African countries are failing to convert these to the advantage of their vast populations who have remained largely locked in darkness. International statistics reveals that Africa generates about 4% of the global electricity, and three quarters of this is used up by South Africa, Egypt and the other countries along the North African littoral (The Economist Newspaper 2007). Poor accessibility of modern energy services which is generally referred to as “energy poverty” is arguably a leading cause of underdevelopment.

Practical Action (2009: 01) defines ‘Energy Poverty’ as “the lack of adequate modern energy for the basic needs of cooking, warmth and lighting, and essential energy services needed for schools, health centers and income generation”. The United Nations Development Plan (UNDP) (2005) cited in Gaye (2007: 04) also defines energy poverty as the “inability to cook with modern cooking fuels and the lack of a bare minimum of electric lighting to read or for other household and productive activities at

sunset.” Zimbabwe is one of the countries in the Southern African region which is currently experiencing severe effects of energy poverty. Social and economic analysts have projected that the country is likely to miss its Millennium Development Goals (MDG) targets by very wide margins. Part of the blame for missing MDG targets is attributed to poverty of energy which derails and stifles productivity. The following image (figure 1) taken from space during the night illustrates the reasons why Africa is regarded as a Dark Continent. Seen from space at night, most parts of Africa are unlit.

Figure 1: Illustration of Africa as a Dark Continent



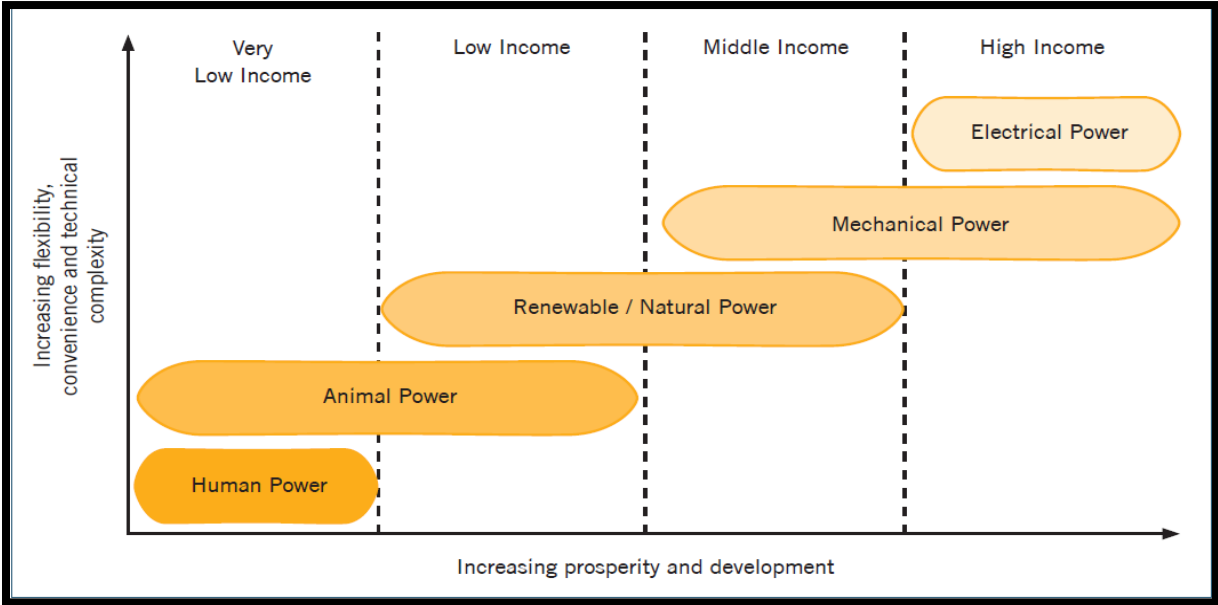
Source: <http://www.strangecosmos.com/>

There is growing recognition that modern energy services are the lifeline to social and economic development. Consequently, there has been a corresponding surge in the scholarship on the discourse of energy and its role in the current international development concerns espoused in the MDGs. Van der Hoeven (2012) argues that MDGs have since their inception assumed a crucial and central role in all development matters. Karver et al, (2012) state that the MDGs are currently being used as the primary yardsticks against which international development strategies are being implemented and evaluated. By their nature, the MDGs demonstrate the world's commitment towards eliminating extreme and persistent poverty. Notably, eight universal goals are acknowledged and these include; (1) Eradicating extreme poverty and hunger (2) Achieving universal primary education (3) Promoting gender equality and empowering women (4) Reducing child mortality (5) Improving maternal health (6) Combating HIV/AIDS, malaria and other diseases (7) Ensuring environmental sustainability and lastly (8) Developing a global partnership for development.

While MDGs have been widely accepted as addressing pertinent global problems, Modi et al (2005) note that not even a single goal which speak directly about energy, its generation, distribution, and sustainability. However, all of the goals in one way or the other require energy to make them achievable. The United Nations (2013) observes that the lack of sustainable energy services has been the greatest derailing factor to the achievement of sustainable development in many developing countries. Modi et al (2005) stress that the real essence of development which needs to be unlocked from the MDGs is dependent upon the accessibility of sustainable energy services by the poor to change their production systems.

The United Nations (2013) observes that modern energy services are critical in all sectors of human socioeconomic development. It stresses that without energy it is difficult to transform the state of underdevelopment in Africa and other developing countries of the world. In this regard, energy is considered to be the backbone of all human socio-economic activities especially in modern day societies. Without sustainable energy services which can enable electric irrigation pumps, stoves, radios, televisions, or even hospital machines it is impossible to achieve the desired outcomes of development which is to improve the quality of people’s lives. The following extract of an energy ladder (figure 2) taken from Practical Action (2009) demonstrates the relationship of increasing access to modern energy services and development. Notably, reliance on traditional sources of energy is associated with high levels of poverty and low incomes as compared to the utilization of electrical energy sources.

Figure 2: Energy Ladder: The Relationship between Different Energy Services and Development



Source: WHO (2006) and UNDP (2009) (Cited in Practical action 2009)

There is mounting research evidence indicating that the lack of sustainable, economically viable and socially acceptable energy services is the root cause of underdevelopment in developing countries (Venema 2004). The disparities existing in the trends of energy usage between developing and developed countries are discouraging. Modi et al (2005) pose that international development agencies including the United Nations, International Monetary Fund, the World Bank and other private donor organizations are now increasing their interest in energy, its production, development and distribution. Kjørven (2012) refers to the speech of Ban ki moon (United Nations Secretary General) at the Rio +20 summit in Rio-de-janeiro which put into perspective the world's commitment towards making energy a universal human right. However, the Organization of Petroleum Exporting Countries (OPEC) Fund for International Development (OFID) (2008) observed that despite significant improvements having been recorded in international rates of electrification, many people in the developing countries of Africa have remained marginalized in terms of modern energy usage.

With less than two years left before the MDGs outlives their legal time frame; many developing countries are still struggling to make visible progress towards attaining these goals. The United Nations (2012) points out that many African governments have decimated their original targets with some reducing their focus to only one or two goals. This has an effect of undermining development in these countries.

MDGs will not be achieved without major improvements in the quality and quantity of modern energy services in developing countries (Modi et al 2005). The Secretary-General's Advisory Group on Energy and Climate Change (AGECC) (2010) observes

that there is a certain threshold of modern energy usage which should be achieved for effective development to take place. Moyo et al (1999) add that, for meaningful development to take place in developing countries of Sub Saharan Africa there is need to rethink and reconfigure local energy policies with emphasis being put on extending electricity to rural households and making modern energy services more affordable and accessible to the poor. In addition, Moyo et al (1999), pose that electrification requires the governments not only to focus on bringing electricity near the people. Rather they suggest that people's capacities should also be enhanced to participate in electrified economies. Poor people often fail to partake in the modern economies because they lack gadgets and equipment as well as know how on how to exploit technology into meaningful services (African Economic Outlook 2012). In this regard, Gaye (2007) opines that electrification of communities which previously relied on traditional energy should be wary and responsive to the capacity of the people to utilize modernized energy services. This might imply government subsidizing the energy sector and making available cheaper loans for people to buy necessary and efficient gadgets.

Apparently, electricity has assumed an indispensable role in modern societies where the economy, communication, production, storage and preparation of commodities are all dependant on its availability. Gaye (2007) posits that modern energy services are fundamental to fulfilling basic social needs, including driving economic growth and fuelling human development. FAO (2011) adds that energy is required for any change in a physical state and this makes it a prerequisite for all productive activities. They further allege that the availability of modern energy services especially electricity is the engine

behind economic growth and can lead to advancements in social and overall human development.

Bradbrook (2005) observes that there is mounting interest at international level to recognize universal access to electricity as a human right. He emphasized that if the main focus of MDGs is to turn around the fortunes of the poor, it is therefore pertinent to increase their access to modern energy services. The African Economic Outlook (2012) refers to a survey carried out in Angola to assess the impact of modernized energy services and concluded that access to modern energy manifests as a fundamental divide between the rich and the poor. Energy poor people spend twice as much as their counterparts who use modern energy services in securing their energy services per month (African Economic Outlook 2012). Alfstad (2005) notes that, it is not uncommon for an African country to spend more than 30% of its development budget on energy instead of investing in other development necessities. More so, not only do poor people incur disadvantages in terms of the monetary values they spend on energy, they also spend prolonged hours gathering and preparing their energy resources (Alfstad 2005). Gaye 2007 posits that poor people pay a high price in terms of their health, labor, time and cash for the energy they use.

Bradbrook (2005) argues that if sustainable energy services such as electricity are not made a universal human right, the task of breaking the circle of poverty and underdevelopment will remain unachievable. He elaborates that all developed countries achieved their current states of development through corresponding increases in energy and related technology utilization. Gaye (2007) adds that development is intrinsically connected to consumption of modern energy and technology. Without visible

improvements on the quality and quantity of energy consumed by developing countries, it is difficult to reverse the current state of underdevelopment. Gaye (2007) opines that the rapid increase in life expectancy in Africa and Asia as the benefits of the spread of electrified technology in the health and medical sectors of these regions. Furthermore, the rapid economic and social development in China is also attributed to the country's increased reliance on modern technological services. The UNDP (2005) thus stresses the importance of energizing the MDGs to make them achievable in energy poor countries.

The current energy policy in Africa according to Moyo et al (1999) is characterized by poor investments in the security of energy supply. With a total of about 1,750 TWh potential of hydropower and 14,000 MW of geothermal potential, the continent continues to exploit less than 5% of these potentials (IEA 2008). The major and well established energy policy in Africa is covered under the New Economic Partnership for Africa's Development (NEPAD) which stresses the need to ensure that all Africans have sustainable access to energy. However, institutional challenges confronting NEPAD make its efforts to transform African Energy sectors weak and ineffective (NEPAD 2012). Due to the absence of a strong willed energy policy in Africa, there are continued high numbers of people relying on traditional forms of energy like wood; animal waste and agricultural residue.

Energy poverty has far reaching implications on the welfare and the sustainability of the environment. Gaye (2007) reveals that due to lack of sustainable energy services in most developing countries, people continue to prey on the natural environment to satisfy their energy needs. The African Economic Outlook (2012) poses that the brunt of poor

accessibility of modern and sustainable energy services is often dispatched to the environment. Moyo et al (1999) refers to the rising concerns over the scarcity of wood fuel currently bedeviling African countries including Zimbabwe, South Africa, Mozambique and Angola. These scarcities imply severe damages on the natural environments.

Gaye (2007) notes that since the age of the industrial revolution, people have been increasing their consumption of fossil fuels and this has led to the rise of carbon dioxide levels from a concentration of approximately 280 parts per million (ppm) to the current 370 ppm. He alleges that these values are projected to increase to 560 ppm before the end of the 21st century. Gaye (2007) contends that these changes are having debilitating effects on poor societies especially those which solely depend on the natural environment for their social and economic livelihoods. Poor people domiciled in developing countries have access to technology which can reduce the impacts of environmental changes. With an increase in the amount of modern energy services at their disposal, people in developing countries can be able to develop alternative means of creating incomes which does not necessarily rely on the natural environment in the non farm sector.

Coming closer to home, the Southern African Development Community (SADC) with its 15 member states and over 250 million people, is heavily weighed down by poverty of energy. The Regional Electricity Regulators' Association of Southern Africa (RERA) (2013) mentions that in the SADC region access to energy is restricted, inadequate and often unsustainable with extensive negative implications on human health and productivity. The impact of energy poverty in the region is well spelt in the different

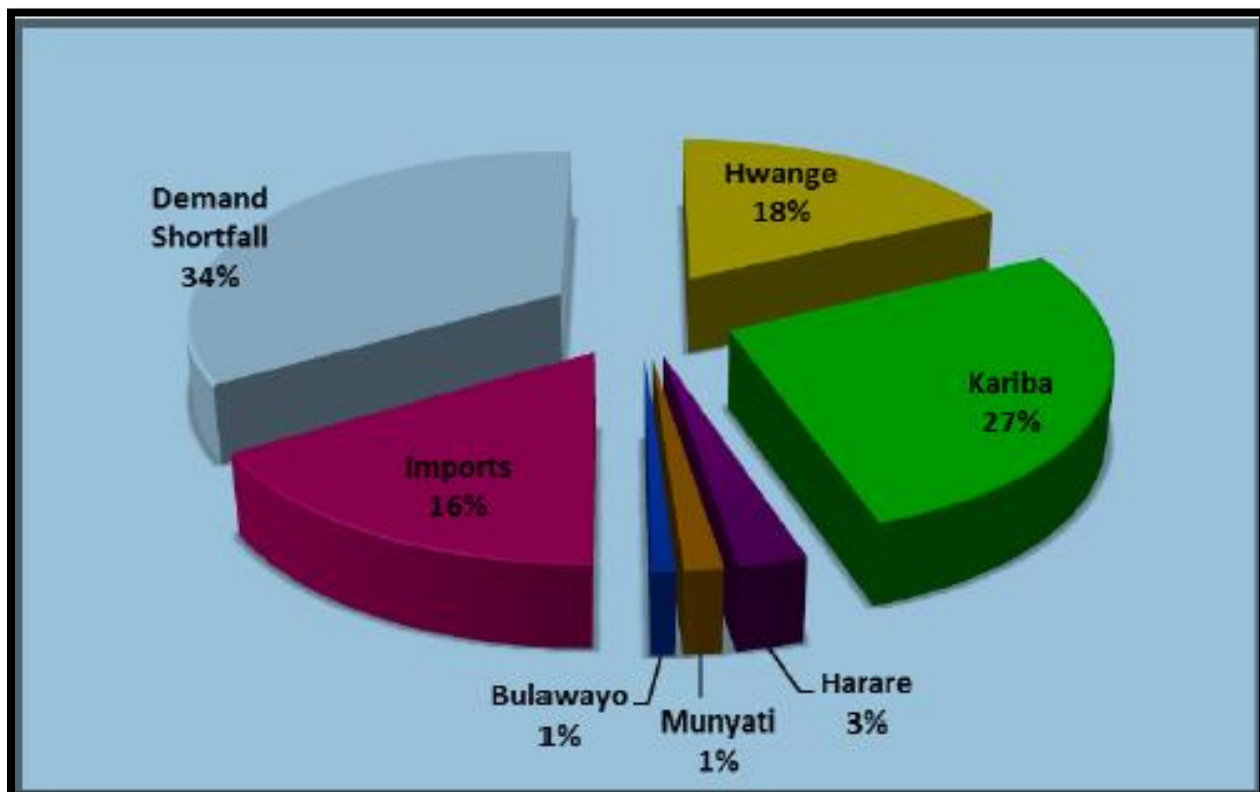
levels of development between the 15 member states whose economic output resonates with their energy consumption levels. The region is now increasingly focusing on harnessing modern energy services as an indispensable tool in service delivery and development agendas. Among other regional policies relating to the eradication of energy poverty and the recognition of modern energy services as an important facet of development are the SADC Protocol on Energy of 1996, the SADC Energy Cooperation Policy and Strategy of 1996 and the SADC Energy Activity Plan of 2000 (RERA 2013). These policy frameworks are attempting to tackle the energy problem from a regional perspective however with little success as countries tend to focus more on their national energy agendas rather than regional policy directives.

1.2. Overview of Zimbabwe and Its Energy Sector

Zimbabwe is a landlocked country with a total land area of 390 580 square kilometers. The country has a population of 12 973 808 people and 65% of these are domiciled in the rural areas (Zimstats 2012). For its energy requirements, the country is dependent on local power generation and imports from neighboring countries. The country relies on local power generation mainly from the Kariba hydro electric dam located in the Zambezi valley and is shared between Zimbabwe and Zambia and the Hwange thermal power station. These local power generators are supported by several other small power plants in Bulawayo, Harare, and Munyati. In total, the country generates 940 mega watts (MW) leaving a deficit of 1560 (MW) to reach the 2500 MW required for sustainable distribution in the country (MDP Zimbabwe Project 2013). Notably, the country imports more than half of its energy requirements from DR Congo, South Africa and Zambia. In terms of accessibility of electricity, only 40% of the Zimbabwean

population is connected to the national grid. The distribution of the Zimbabwe's energy shows that 62% of country's energy goes to residential use, 9% goes to agriculture, while industry consumes 13% (MDP Zimbabwe Project, 2013). The following chart (figure 3) shows the distribution of energy supply from different sources in Zimbabwe.

Figure 3 Composition of Electricity Supply from Various Sources in Zimbabwe

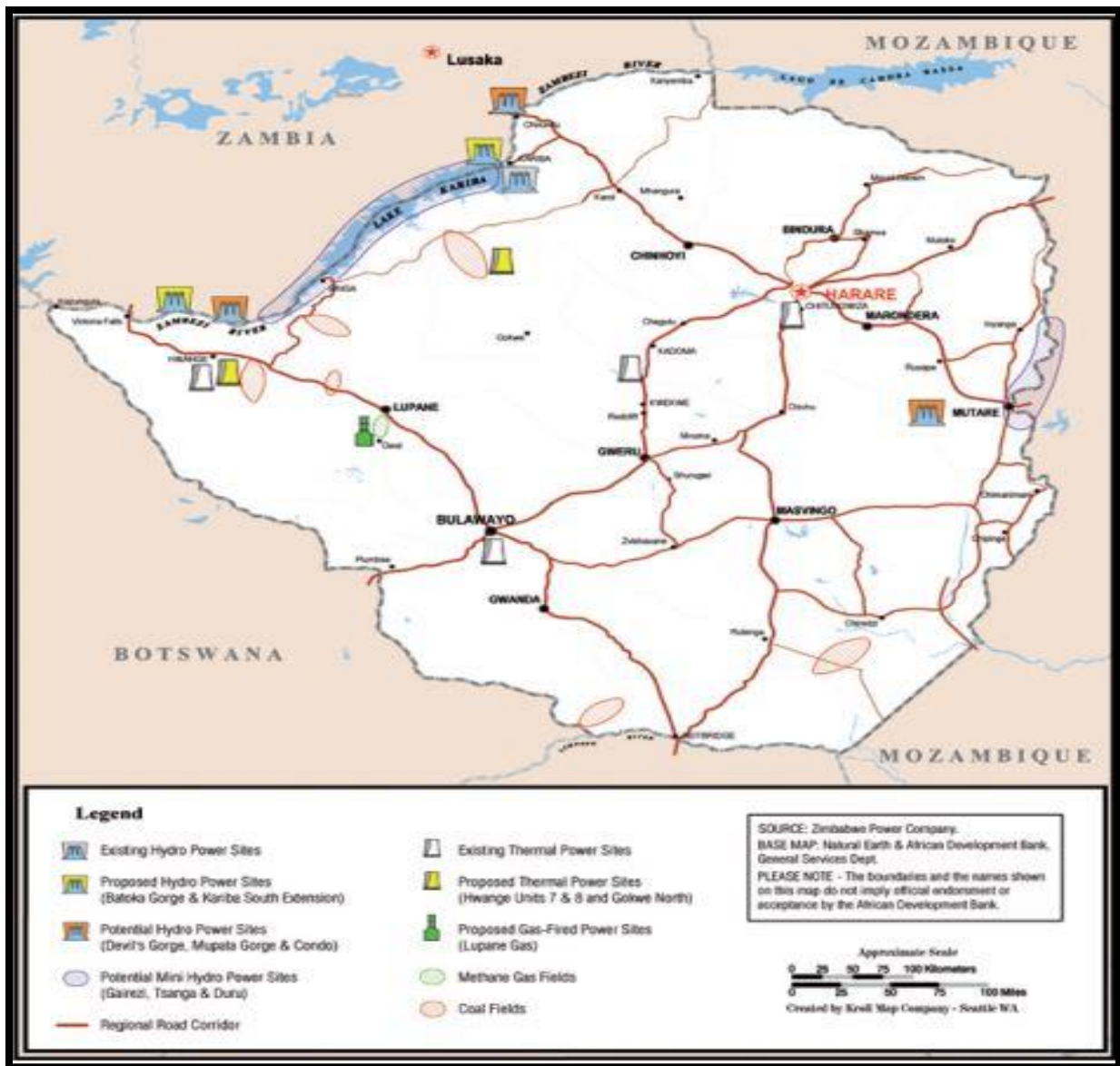


Source: Economic Consulting Associates & Practical Action Southern Africa (2013)

According to the ZMEPD (2012), the country's main sources of energy include coal, wood fuel, electricity and liquid petroleum fuels. The ministry mentions that national energy balance in the country indicates heavy reliance on wood fuel, coal, liquid fuels and electricity. These sources of energy supply caters for the following energy supply

respectively, wood fuel 53%, coal 20%, liquid fuels 14% and electricity 13% (ZMEPD, 2012). Moreover, the rate of electrification in the country stands at 40% nationally while access to modern energy services in the rural areas is 19% (ZMEPD, 2012). The following (figure 4) is a map of Zimbabwe showing various existing and potential energy sites in Zimbabwe.

Figure 4: Existing Energy Plants and Potential Sites in Zimbabwe



Source: The African Development Bank (2011)

Zimbabwe's energy sector is largely controlled by the government through the Ministry of Energy Power and Development. There is very little private investment in the energy sector of the country. The African Development Bank (2005) notes that the Electricity Act of 2002, is the main Act on which the major structures and institutions including ZESA Holdings which is the parent company for the Zimbabwe Power Company (ZPC), the Zimbabwe Electricity Transmission Company (ZETCO), Zimbabwe Electricity Distribution Company (ZEDC) and Powertel. All these companies are charged with the responsibility of generating, managing and distributing electricity in the country. Additionally, the Rural Electrification Agency of Zimbabwe (REA) (2013) poses the Rural Electrification Fund Act of 2001 which was passed in 2002 is the fundamental policy governing the electrification of rural areas. The Rural Electrification Fund Act provided for the establishment of the Rural Electrification Agency (REA). In essence, the Act paved way for the extension of the national energy grid to the previously excluded rural areas. As of 2010, REA had electrified more than 6,000 rural centers, including schools, health centers, government offices, businesses, and irrigation schemes through its expanded rural electrification programme (ADB, 2005).

Internationally, Zimbabwe is a signatory to the Millennium Declaration which places it under an obligation to increase efforts towards achieving MDGs. The government has officially endorsed MDG 1, 3 and 6 as national priority goals (ZMEPD, 2012). At a regional level, Zimbabwe is a signatory to the SADC Protocol on Energy which deals with regional energy security issues. The country is also one of the twelve active members of the Southern African Power Pool (SAPP) which seeks to establish a regional energy regulator (ADB 2005). Mapako and Prasad (2007) write that the

ZMEPD has since started reconfiguring the country's energy sector to be able to capture the country's development priorities in line with international and regional policies. Energy RECIPES (2011) poses that the recently passed National Energy Policy of Zimbabwe which was passed in 2011 is a reflection on the commitment by the government to ensure sustainable development through increasing accessibility of modern energy by all sectors of the economy. The ZMEPD (2012) writes that the National Energy Policy is founded within the dictates of the framework of the MDGs and observes the centrality of modern energy to development.

Mapako and Prasad (2007) pose that Zimbabwe started to recognize the importance and centrality of modern energy services as a medium for sustainable development in the early 1980s when it launched the rural electrification program. The black majority government which had taken over from the colonial regime in 1980 had a huge obligation of honoring the promises made during the war time including bettering social and economic service provision in previously marginalized black communities. This included extending the national energy grids to rural growth points. In this light, the REA (2013) notes that Zimbabwe started extending the national electricity grid to rural areas in 1989. The target areas of the initial rural electrification programme were rural service stations mainly government offices and public institutions such as hospitals, clinics, police stations, veterinary offices, and other related government departments located in rural areas (REA 2013). Mapako and Prasad (2007) mention that the extension of the national energy grids during the initial phase excluded private households. Concurring, REA (2013) acknowledges that the initial electrification program used a top down approach in which it targeted particular growth points with the hope that installation of

modern energy services at these strategic points would have the benefits cascading down to the ordinary person.

In Zimbabwe, as is often the case in most African countries, rural households are the hardest hit victims in terms of accessibility of modern energy services. The Rural Electrification Agency of Zimbabwe (REA) (2013) poses that the majority of rural households lack access to electricity. Mapako and Prasad (2007) observe that in Zimbabwe, most rural households derive 80% to 90% of their energy needs from wood fuel. In this light, the ADB (2005) writes that lack of proper planning in terms of settlements often complicates the supply of electricity or any other modern energy services to rural areas. The report further elaborates that in rural areas, there are no settlement patterns followed, people construct their settlements haphazardly and this make supply of grid services difficult. In support of this view, Okeefe (1999) in Moyo et al (1999) point out that some communities are founded on hilly or mountainous areas and this makes the supply of energy through grid lines difficult and in some instances virtually impossible.

Improving accessibility of modern energy services in Zimbabwe has great potential of expanding social and economic opportunities for the poor. Okeefe (1999) in Moyo et al (1999) argues that electrification of rural areas for instance carries with it the possibility of creating green jobs. Also, Moyo et al (1999) believes that electrification is a means of enhancing human capabilities, for instance lighting in the homes allow children to read efficiently hence improve their academic output. Also, modern energy services allow for improved transport and communication. Africa Renewable Energy Access (AFREA)

(2012) notes that in Zambia, electrification of some peri-urban and rural households led to improved access to information through radios, and television sets.

1.3. Problem Statement

Lack of access to electricity and other forms of modern energy services in Zimbabwe impede the transformation of rural communities from the current traditional mode of production and consumption to a modern mode of production and consumption. Poor access to efficient, reliable and environmentally friendly energy services undermines developmental initiatives and policies. Rural Zimbabwe is largely characterized by poor industrialization resulting in most rural people depending on agriculture for their livelihoods. However, without industrializing, rural transformation is very much unlikely. AFREA (2012) opines that rural industrialization carries with it the possibility of developing human capital which is often underutilized. It can create new non farm employment which will bring the much needed incomes in rural economies.

Without sustainable energy alternatives, rural rely on cheap but environmentally destabilizing wood fuels. However, wood fuel and other fossilized fuels used by the rural poor emit large amounts of greenhouse gasses which cause climate change in ways which they cannot withstand. Research has established that households which dependent on traditional energy services spend a substantial amount of their incomes and time on acquiring these energy services. Utilizing electricity instead of fossil fuels is efficient by more than 10% both in terms of saving family incomes and time spend in collecting and preparing fossil fuels (Modi et al 2005).

Increased access to modern energy services has potential of reaping crucial social and economic benefits for rural communities through improving their access to information through radios and televisions. Improved access to modern energy services will also exonerate women and girl children from the daunting and time consuming cultural responsibility of gathering energy resources which deprives them of enough time for personal development. Increased access to modern energy services can also improve agricultural productivity through agricultural transformation which increases productivity and thus address the challenges of domestic and national food insecurity.

The future of rural transformation and the attainment of MDGs is elusive in an energy poor Zimbabwe. It is however possible to achieve a milestone towards achieving these goals through improving accessibility of electricity by the poor and assisting them to use these services and its related technologies to boost economic and social productivity. This research will hypothesize that energy poverty is impeding rural transformation in Dewedzo.

1.4. Aim and Objectives of the Study

The major thrust of this research is to explore the relationship between energy poverty and underdevelopment in rural Zimbabwe. Essentially, the research focuses on analyzing the merits and effects of modern energy services in aiding the achievement of the MDGs. The following specific objectives are central in the research.

- To assess the impacts of poor access to modern energy services on the livelihoods of people in Dewedzo.
- To determine relationship between poor access to modern energy services and the attainment of MDG 1 and 3.

1.5. Significance of the Study

There has been wide scholarship on the discourse of energy poverty and its impact on the attainment of the MDGs. However, very little has been written specifically on Zimbabwe. Nevertheless, so much has been argued about the energy crisis which is currently experienced in the country. Gwamuri and Mhlanga, (2012) focus on the technical aspect of Zimbabwe's energy crisis, and they argue that the energy problem in Zimbabwe is a result of dilapidating energy infrastructure in the country. Although Gwamuri and Mhlanga (2012) acknowledge that energy is central to development, they fell short of showing the link between energy and improvements in human social and economic conditions. This research takes as its objective an assessment of how energy is linked to sustainable human development and achievement of MDGs. A deeper analysis of how poverty of energy might be impacting on people's abilities to develop skills and opportunities necessary for them to lead lives which they value most will be the departure point of this study.

Moyo et al (1999) place emphasis on the security of energy supply in the SADC region. They perceive that the Sub Saharan African region is currently plagued by the absence of effective and robust energy policies. Although there are several policies relating to sustainable energy in Africa, there is often poor coordination and implementation of

these. In this light, Moyo et al (1999) perceive Africa's energy problem from an international perspective where he castigates lack of effective continental policy frameworks for the continent's energy challenges. While the international perspective of energy poverty remains important, in this study major thrust will be placed on the interplay between energy poverty and rural transformation with special reference to MDG 1 and 3.

There are very good energy policies in Zimbabwe; however they often lack proper implementation and evaluation (ADB 2005). While the ADB (2005) concluded that implementation of energy policies is the fault aspect in Zimbabwe's energy sector, this study is more interested in understanding the impacts of poor implementation of these energy policies on energy security and ultimately on human development. The research is envisioned to validate the available energy policies and provide recommendations as to what needs to be done to ease the challenge of energy poverty on rural livelihoods.

In addition, the findings of this research will generate a broader understanding of the nature and scope of energy poverty in Zimbabwe. The nature and scope of Zimbabwe's energy poverty is peculiar; the country has several energy resources which are untapped, but still, vast population groups are still living in darkness due to lack of affordable and efficient energy services. This study will therefore be significant in providing a greater understanding of the concept of 'energy poverty' in an environment where there exist vast energy resources.

Another important facet of this research is its interest to establish the relationship between energy poverty and the MDGs. Modi et al (2005) observes that when the

MDGs were adopted, it assumed that all countries had similar social and economic resources necessary to achieve the goals. He castigates the one solution fits all approach which was taken when MDGs were adopted without looking seriously into the energy dynamics in most developing countries which often put them at competitive disadvantages. This research will draw heavily from the perceptions of these writers. Given that MDGs are in their twilight zone, this research provides an opportunity for reflection on the MDGs. It will provide recommendations as to what needs to be considered in the next generation of international development policies which will replace the MDGs. The findings of the research will provide evidence as to why consideration of the social and economic infrastructure including energy production, security and its accessibility by the rural poor should be paramount in designing the next generation of international development goals after the expiration of the MDGs.

1.6. Research Methodology

Various types of research methodologies are recognized and these include historical, comparative, descriptive, co-relational, quantitative, qualitative, experimental, feminist and cultural methodologies. In this research a qualitative methodology was used. According to Creswell (2009), a qualitative methodology takes an explorative stance in which social reality is constructed and perceived subjectively. Klein and Myers (1999) pose that in qualitative research, the researcher becomes the vehicle through which social reality is constructed and revealed.

The motivation behind adopting a qualitative methodology is because it addresses itself to the inside perspective of social reality. A qualitative methodology in this research is

envisaged to gather the perceptions and experiences of people on the impacts of lack of access to modern energy services on their capacities for development. Further, a qualitative research method offers a rich reservoir of meaning, interpretation and is also good at answering critical dimensions of the research problem like “what, how, when, and where”. Such dimensions of a problem are often unanswerable under other methods such as the quantitative method (Creswell 2009). Moreover, using a qualitative methodology in this research is deemed to be crucial in preserving the integrity and meaning of data to be collected. Unlike in quantitative research methods where data conversion and suppression often result in some data losing its meaning, the qualitative approach preserve the meaning of data as it is captured, analyzed and reported verbatim without major changes in its content (Neuman 2011).

The proposed research is interested in the generation of knowledge on how people perceive and socially construct the impact of energy poverty on their development and the subsequent attainment of the MDGs. Since the impacts of energy poverty cannot be objectively quantified, people will have to describe the manner in which it is affecting them and it is through their narration that an analysis of the relationship between energy poverty and MDGs can be arrived at. Qualitative methods will thus be used in collating data which will be used in justifying or refuting the hypothesis that poverty of energy causes underdevelopment. Denzin and Lincoln (2000), claim that qualitative methods brings the researcher closer to the people or phenomena under study, it gives the respondents an opportunity to define their situation, and narrate the meanings of the situation, state of the phenomena or events. A detailed methodology including procedures and considerations relating to this study will be outlined in chapter 3.

1.7. Delimitations of the Study

According to Creswell (2007), delimitations are possibilities of weakness and strengths expected in the research process. Nenty (2009) postulates that delimitations navigates the manner in which the researcher is choosing to narrow the scope of the study this include geographical location of the research and what the researcher intends to do or do not intent to do. Nenty (2009) quotes Isaac and Michael (1990) in posing that, delimitations can also be understood as purposeful narrowing of the scope of the research by focusing on selected aspects of the problem in the current study. This section discusses the delimitations of the study.

Apparently, energy is a wide and rather complex subject which involves several energy sources including liquid fuels such as diesel and petrol, natural gasses including biogas, solid fossil fuels including wood fuel and coal, solar energy and hydro electric power. This research is delimited to only focus on electric energy. Precisely, this includes electrical energy generated from various sources.

While a complete and focused analysis of the impacts of energy poverty on the eight MDGs is desirable, doing so can potentially reduce objectivity hence in this research, focus will be placed on MGD number 1 and 3. The Zimbabwean government officially declared its priority to be on achieving goals 1, 3 and 6 (ZMEPD 2012). The researcher contends that analyzing all the goals with the same precision will lead to falsified research output as other goals may not necessarily be affected by energy but they may be suffering from lack of support from the state.

1.8. Ethical Considerations

Most research activities revolve around people's participation or involvement in one way or the other and for this reason, researchers are obliged to be cognizant of certain ethical issues. Ethical standards of research demands that anyone who gets involved in research need to be aware of and abide by the general agreements shared by researchers about what is proper and improper in the conduct of scientific inquiry. In this study, the researcher undertook several precautions and undertakings so as to ensure that both the process and the results of the study conform to acceptable norms and standards of shared in academic inquiries.

Researchers have an ethical obligation to ensure that people's in a research project is voluntary. This implies that no one can be made to participate in a research programme through coercion. Denzin and Lincoln (2000) argue that the principle of voluntary participation is dependent upon other principles such as the principle of informed consent. According to this principle, people have the right to be informed, and made aware of their rights prior to their participation. This is perceived as a process of empowering the participants to allow them to make informed and independent decisions. In this study, all the participants were reliably informed about the implications of their participation. They were also informed that their participation is voluntary and should they decide to discontinue their participation they would do so without further questioning.

Researchers are also obliged to be ethical in terms of the manner in which they should treat and use publications from other researchers. The researchers are mandated to always acknowledge by way of citing the sources from where they would have gathered

their information. Failure to fully and correctly acknowledge sources of information amount to an unethical practice which can attract criminal charges. In this study, the researcher has fully and correctly acknowledged all secondary sources of information.

In compliance with the University of Fort Hare ethical clearance requirements, the researcher first sought and obtained an ethical clearance certificate before conducting the study. The researcher abided by the ethical principles of the University of Fort Hare which among other include; promoting and observing universal values of justice, integrity, discipline, love, kindness, non-injury, concern for the wellbeing of others, respect for human dignity, equality, freedom and diversity.

According to Nenty (2009) it is an ethical obligation for a researcher to ensure that the outcome of his or her research is made public so as to allow other researchers to validate the validity and reliability of such research. In this light, the researcher undertakes to make available copies of his research in the University's library where easy access to it will be possible.

Researchers are bound to be ethical in the manner in which they use other people's academic work. Denzin and Lincoln (2000) mention that plagiarism is a criminal offence. Ethical research ensures that the researcher duly and fully acknowledge all sources of information which does not originate with him/her. In this study, the researcher acknowledged all books, news papers, journals, reports and any other source of information used by means of proper citation and referencing.

1.9. Framework of Chapters

1.9.1. Chapter one: General Overview of the study

This chapter outlines the background of the study. It outlines the research problem, aim and objectives of the study. It also discusses the study area, the implication of the study and introduces key terms which are pertinent to the central discourse.

1.9.2. Chapter two: Literature Review

This chapter conceptualizes the discourse of energy and its relevance in the domain of development within the context of the Modernization theory and the Sustainable Development approach.

1.9.3. Chapter three: Research Methodology

This chapter discusses the research methodology, which describes the manner in which the research will be carried out. It involves laying out a plan of the way a researcher intends to conduct the research project. The chapter will also discuss the various instruments of data collection, the procedure for data collection and data analysis.

1.9.4. Chapter four: Research Findings and Discussion

This chapter will focus on presenting the research findings and data analysis. It will put the gathered data to interrogation or a rigorous test to force it to review its meaning.

1.9.5. Chapter 5: Summary of findings, Conclusions & Recommendations

This chapter will focus on giving conclusions and recommendations basing on the outcomes of the research.

CHAPTER 2

Theories on Energy and Sustainable Development

2.1. Introduction

Modern energy services are fundamental to the provision of many basic human needs, such as cooking, heating, lighting, and motive power used in enabling industrial and domestic machines. Other essential services which are dependent on modern energy services include modern healthcare, education and communication. There are perceptions that a direct relationship exist between lack of access to modern energy services and an array of negative human development indexes including poor and failing public health systems, low literacy rates, hunger and malnutrition, low life expectancy and poor democracy and public participation. Inversely, increased consumption of modern energy services is favorably perceived as a precondition for economic growth and improvement in human conditions. In Zimbabwe, poor access to sustainable modern energy services has been condemned as an impediment and a cause for protracted rural underdevelopment. The previous chapter elaborated on the notion of energy poverty and how it is affecting efforts to transform rural societies. This chapter provides a theoretical framework which will be used in understanding the concept of energy poverty and its subsequent impact the attainment on the MDGs. The chapter outlines, the various narratives of the notion of development before delving into a critical analysis of the modernization theory and the sustainable development approach which will lead to the development of a contextualized theory of energy and sustainable development.

The unavailability of sustainable energy services in rural areas of Zimbabwe condemns rural communities to perpetual socioeconomic underdevelopment. Modern energy services play a critical role in modern economies; it lies at the heart of all production, distribution, marketing and consumption. Without improving the accessibility of modern energy services; endeavors to transform rural economies can be a futile process. Internationally high ranking institutions like the United Nations, the World Bank and the International Monetary Fund (IMF) are calling for a massive investment in the energy sectors of developing countries to make the task of breaking developmental crisis and poverty alleviation in these countries surmountable (Ogunlade and Youba (2002).

Speaking at the Rio +20 Summit in Rio de Janeiro (Brazil) (2012), Ban Ki-Moon (Secretary General of the United Nations) mentioned that poor access to modern energy services condemns poor people to darkness, ill health, and missed opportunities. Inglehart and Welzel (2005) stress that poor people often use energy sources which victimizes them economically, socially, and physically, including health wise. In view of the various negativities associated with poor access to modern energy services, it can be asserted that increasing accessibility to modern energy services guarantees better, education, health, industry, wealth and the general wellbeing of people.

In the wake of the Millennium Development Goals, it has been increasingly argued that the first and necessary move towards breaking the cycle of poverty and under development is to improve the quality and quantity of energy consumed by the poor. Ogunlade and Youba (2002) argue that efficient and reliable energy services are crucial for industrialization, and improving social and economic productivity in developing

countries. Apparently, there is increasing acceptance of the view that the problem of lack of development in most developing countries is closely linked to the lack of access to modern energy services.

2.2. Defining Development

The discourse of development is a contentious issue, which over the years, have assumed various meanings and conceptualizations. Peet (1999) mentions that researchers and scholars have failed to unanimously agree on what it is, what it constitutes and how it can be achieved. Similarly, Willis (2011) argues that development is a multi-dimensional and multi-faceted process which cannot be effectively captured in a single definition. So (1990) proposes that to better comprehend the notion of development, it is imperious to first identify what is intended by development rather than try to define what it is. However, Hopper (2012) postulates that it is difficult to pin point what exactly is intended by development because over time it has accrued many different approaches, theories and interests such that it has assumed many different interpretations. Hopper (2012) points out that conceptualizing the notion of development is also made difficult by the fact that over generations, its meaning, and nature has evolved. Development has evolved from perceptions that it is rationalism, progress, economic growth, modernity, to the more current approaches such as sustainable development, good governance and human development (Hopper 2012).

Chambers (1983) poses that development in its simplest form can be conceptualized as the objective of moving to a state relatively better than what previously existed. In essence, Chambers (1983) perceive development as change which encompasses a

movement towards a desirable state in society. The UNDP (2001) observes that, in the recent past, the major thrust of development theories has shifted towards human centered development. Hopper (2012) asserts that although economic development continues to be an important determinant of development, it has ceased to be the foci of development theories and activities. He maintains that in the wake of different dimensions of development; in the late 1980s, the UNDP adopted the Human Development Index as a priority measurement instead of the GDP which used to be the sole determinant of development. Taking note of the centrality of people in the development equation, Peet (1999) argues that development entails improvement of human conditions. The focus of developmental initiatives is thus on empowering people to be able to control factors within their socioeconomic environment so as to allow them to creating lives which they value most.

The Human Development Report (UNDP 2001) stresses that real development creates a range of opportunities which will assist people to make the most out of their lives. Precisely, the UNDP (2001) stresses the imperativeness of improving human capacities to allow them to effectively partake in their local economies. The human development approach to development emphasizes that “development is concerned about creating an environment in which people can develop their full potentials and lead productive, creative lives in accordance with their needs and interests” (UNDP 2001:06). In modern democracies, development is more concerned about availing conditions which will afford people an opportunity to create their own lives independently. Peet (1999) believes that development is more about creating avenues for self-sustenance rather than giving out aid which creates dependence.

Humanity has for a very long time been seized with the desire to find a befitting definition and connotation of what the concept of development should entail. As has been demonstrated above, various interpretations of development has been proffered to account for various trajectories of development. It has emerged that although economic growth remains a very important facet or component of development, it can not be deemed as development in it self but rather it is a means to an end in which case human development is the intended end. Development is inclusive, it does not focus on making available material resources to people but also attempts to improve the capacity of people to be able to participate and take ownership of the material benefits of development. The inclusivity of development according to Sen (1999) (Cited in Tungodden 2001) implies the acquisition of essential skills and resources by people and their ultimate ability to use these in creating their own wealth, opportunities and enhance their freedom and participation. In this regard, development can be conceived as improved access to information, education and technology by the people to help them in decision making and in improving their productivity on which their livelihoods are based (Tungodden 2001). In its inclusiveness, development aims to achieve sustainable development which relates to the ability to of the people to control environmental variables so as to be able to extract the best possible profits from using natural resources without compromising its quality. In the following section, an attempt was made to critically analyze the modernization theory and the sustainable development approach as the guiding theoretical ideas for the study. Also, a tailor made theoretical framework on energy and sustainable development is also devised.

2.3. The Modernization Theory

The modernization theory is one of the early paradigms which were postulated in the late 1950s and early 1960s as plausible explanations for the widening differences between countries in terms of poverty and deepening developmental crisis (Peet 1999). It was a survival strategy devised during the tumultuous and wary cold war between 1945 and 1990. Willis (2011) believes that the modernization theory was inspired by the need to find a model for the reconstruction of European countries which had been largely ruined by the Second World War. So (1990) writes that the 1950s and 1960s period was characterized by the emergency of new states which were previously under colonial rule, and these were in need of a development model which would help them sustain their newly found independence. A series of Asian-African conferences like the Bandung Conference of 1955 in which African and Asian leaders alike pledged to support each other posed threats to the sustenance of Western supremacy (Rist 2002). Western countries particularly the United States of America which had emerged victorious in the preceding Second World War was facing stiff ideological challenges and competition from the emerging Soviet Union whose ideology of communism had extended to China and Korea and was feared to spread to the newly forming states in Africa and Asia. Communism was putting a strain on the sustainability of the notion of capitalism and this warranted the development of a grand theory which would overshadow skepticism against the West and ensure continued supremacy of Western ideas.

The modernization paradigm was developed from the fusion of ideas from various disciplines, including economics, sociology, geography, politics and psychology.

Schuurman (1993) opines that the modernization paradigm provides a holistic platform for conceptualizing the very essence of development in its multi-dimensional structure. He further writes that the modernization paradigm attempts to define what constitutes development and regulate how such development can be achieved through a linear process such as the one used by developed countries.

From a modernistic perspective, development can be conceived as a process of Westernization, in which Western construction of development including capitalist modes of production, civilizations, value systems and cultures are adopted by non-Western societies as tools for development (So 1990). Viewed through Pro-Western lenses, development is perceived to mean modernity, in which case modernity is the summation of Western, production systems, consumption habits including their social systems and values (Willis 2011). Levy (1967) (Cited in So 1990: 24) defines modernity as “the extent to which tools and inanimate sources of power are utilized.” Modernity can be viewed as a total social process associated with (or subsuming) economic development in terms of the preconditions, concomitants and consequences of the later (Bernstein 2007). With reference to Lerner (1967), Bernstein (2007) mentions that modernization is a social process of which development is the economic component. In this sense, modernization is perceived as a means towards economic development and hence, development is equated to economic growth.

From a different perspective, modernization is conceived as the progressive transformation of society from an underdeveloped state to a more complex and developed society. The modernization paradigm divides the world into two conceptual and developmental zones that is the traditional society and the modern society with the

latter being more desirable. This conception of development as an evolutionary process is well captured in Parsons sociological theories of development (So 1990). In his writings, Parsons (1902-1979) (Cited in So 1990) emphasize that modernization is a functional and structural phenomenon. He asserts that modernization is a systematic and transformative process which begins at cultural and philosophical level at which the society need to adopt secular modes of thinking (So 1990). Smith (2003) concurs with Parsons on the assertion that to achieve a state of development or modernity, a society has to radically change its traditional structures and values and emulate more dynamic values. So (1990) asserts that the modernization theory is rooted in the classical sociology of Weber which identified two types of societies as traditional and modern societies. Peet (1999) adds that during the 1950s and 1960s, a series of dualistic models were constructed around the traditional-modern dichotomy. Essentially, traditional societies were conceived as being based on group norms and values. On the other hand, modern societies were conceived as being founded on functional specialization and social differentiation (Peet 1999). The rationale behind the conception of traditional societies as being undeveloped is based on the perception that the traditional society is agrarian based and mainly offers labor intensive careers or occupations and use primitive technologies (Bernstein 2007). By way of contrast, Smith (2003) views that modern societies are characterized by capita intensive and technologically advanced industries whose production is targeted for the market unlike that of traditional societies whose production is basically for subsistence purposes. Bernstein (2007) observes that the modernization theory advocates for the displacement of the traditional sector by the modern sector.

Another important conceptualization of development in terms of the modernization theory has been Rostow's theory of economic growth. Rostow developed five stages which he believed to be crucial and definitive of the various social and economic preconditions necessary for full fledged development (Bernstein 2007). To Rostow, (Cited in Willis 2011) underdevelopment is the initial stage for all countries and societies. He believed that all societies has a potential of becoming developed thus he proposes 5 stages namely, the traditional society stage, the preconditions for takeoff stage, takeoff stage, the drive to maturity stage and the age of high mass consumption stage (Willis 2011). In the context of Rostow's theory, if a country passes these phases, it would loose its traditional form and become an urban and developed society.

Overall, the modernization theory can be summed up to be viewing development as a process driven through mobilizing technology and utilizing natural resources in mechanized ways to achieve industrialized and secular societies. The modernization paradigm places emphasis on mechanization of production and industrialization (Willis: 2011). The theory holds that, traditional communal life which is dominated by primitive tools of production, production for personal consumption and subsistence, dependence on family labor, as well as traditional and superstitious beliefs makes the society to be static, conservative and underdeveloped (So, 1990). On the other hand, societies which focus on large scale commercial production through utilization of technology like those utilized in developed countries have higher chances of escaping poverty and underdevelopment (So, 1990). Developing countries have a greater chance of attaining development if they imitate the manner through which developed countries achieved their development (Willis 2011).

To change the state of underdevelopment in traditional societies, there is need to change the values, attitudes and perceptions and other indigenous factors which blocks development. Kuhnen (1987) views that extending technological services to traditional societies can effectively address developmental challenges and create new avenues of growth and development in these societies. In its basic form, modernization implies developing modern production systems, which amounts to adopting contemporary and efficient technology including education, medicines, energy, communication and transport systems. Not only will modernization lead to increased productivity but will also result in improved livelihoods.

Bernstein (2007) emphasizes that the thrust of the modernization paradigm is on the need to transform traditional societies' value systems, production systems and other perfidious endogenous factors which impede development and replace them with more dynamic systems which are permeable to development. So (1990) perceives that from a modernistic perspective; Western production and social systems are thought of as being more permeable to development. He further argues that developmental ideas and apparatus used by developed countries to achieve their current state of development can be transferred to developing countries with equally the same results. Importantly, Willis (2011) believes that developed countries have a wealth of information and inventions which can benefit developing countries.

The modernization paradigm can be a very useful frame of reference in understanding the impact of energized infrastructure and technology on the achievement of human social and economic development. Gaye (2007) observes that although some countries are endowed with vast economic resources, their governments are failing to exploit

these so as to achieve lasting development. He refers to the agricultural sectors of developing countries where most communal farmers who form the back bone of the economy cannot use energized machinery due to poor access of modern energy services and resultantly their productivity is often low. Mapako and Prasad (2007) and Moyo et al (1999) mention that most governments of developing countries are realizing that modern energy is vital for effective development strategies. This has resulted in many governments rolling out rural electrification programmes, however, the thrust of such programmes is often not on improving efficiency and productivity in the rural areas but rather they are targeted at providing energy to rural based government departments. Cousins and Scoones (2009) opine that productivity in developing countries such as Zimbabwe is still very primitive. They refer to agricultural sectors of developing countries where production is seasonal and for subsistence purposes and argued that reliance on natural seasons for production is a challenge to development. There is vast developmental potential in most developing economies if indigenous attitudes towards production are transformed to suit market oriented production and if peasant production is supported with modern equipment and reliable energy services.

So (1990) poses that although the modernization school still has relevance within the discipline of development studies, it has some well-founded criticisms leveled against it by scholars and researchers. Critics of the modernization theory perceive that the theory has no provision to allow for the redistribution of economic gains to other poor and socially vulnerable people. Continued accumulation of wealth by the rich, the elite and the politically connected creates and exacerbates social inequalities in society. The

preoccupation with economic gains that does not translate to increased opportunities for the poor is in itself a factor contributing to development of underdevelopment.

So (1990) avers that the evolutionary proposition that development is unidirectional amongst modernists is one of the most criticized aspects of the theory. Critics view that this assumption undermines the potential and creativity of developing countries to develop their own special kind of modernity which respects their local cultures, values and which ties well with their local resources. Bernstein (2007) opines that assuming that development is unidirectional and the master plan or model for such linear development is the Western history, amounts to an ethnocentric model. Peet (1999) argues that a web of factors contributed to the achievement of development in Western societies other than their over emphasized cultures. In a more similar way, Bernstein (2007) critic the conceptualization of the traditional-modern dichotomy in which the traditional is always perceived as negative, naïve and barbaric. In tandem, So (1990: 54) writes that “concepts such as ‘advanced’, ‘modern’, ‘traditional’ and ‘primitive’ are merely ideological labels used to justify Western supremacy. So (1990) thus mentions that the preoccupation with the articulation of the Western history and trying to create a similar developmental trajectory in developing countries made researchers of the modernization paradigm to overlook alternative paths for transforming developing countries.

From an ecological perspective, the modernization theory is chastised for being an advocate of mechanization without a plan of environmental sustainability. Willis (2011) observes that the modernization paradigm emphasizes economic growth without a plan for controlling the environmental impact of such growth. More so, Peet (1999) argues

that the method of accumulation pursued under the modernization theory leaves the majority in poverty and enhance vertical development of modernizing elites. He observes that the modernization perspective emphasizes on a capitalistic mode of production in which social differentiation is encouraged. This is perceived as detrimental to the achievement of an equal society.

2.4. The Sustainable Development Approach

The concept of 'sustainable development' became a buzzword in the domain of development in the late 1980s and gained prominence in the 1990s (Willis 2011). The theory takes as its point of departure the view that the natural environment and resources are the basis of all development, hence it should be protected to ensure that all humanity both current and in the future would be able to meet their needs (Tietenberg and Lewis, 2010). Additionally, the UNDP (2005) poses that the framework of the sustainable development approach describes the parameters for a development approach which observes the centrality of the relationship between socioeconomic development and environmental sustainability. Willis (2011) opines that the discourse of sustainable development is not very old in the arena of development studies. She mentions that although various articles which observed the importance of harmonizing human activities with environmental considerations has been published in the 1960s, it is the World Commission on Environment and Development report compiled by the Brundtland Commission in 1987 which is acknowledged for coining the concept of sustainable development. The Commission defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Willis 2011).

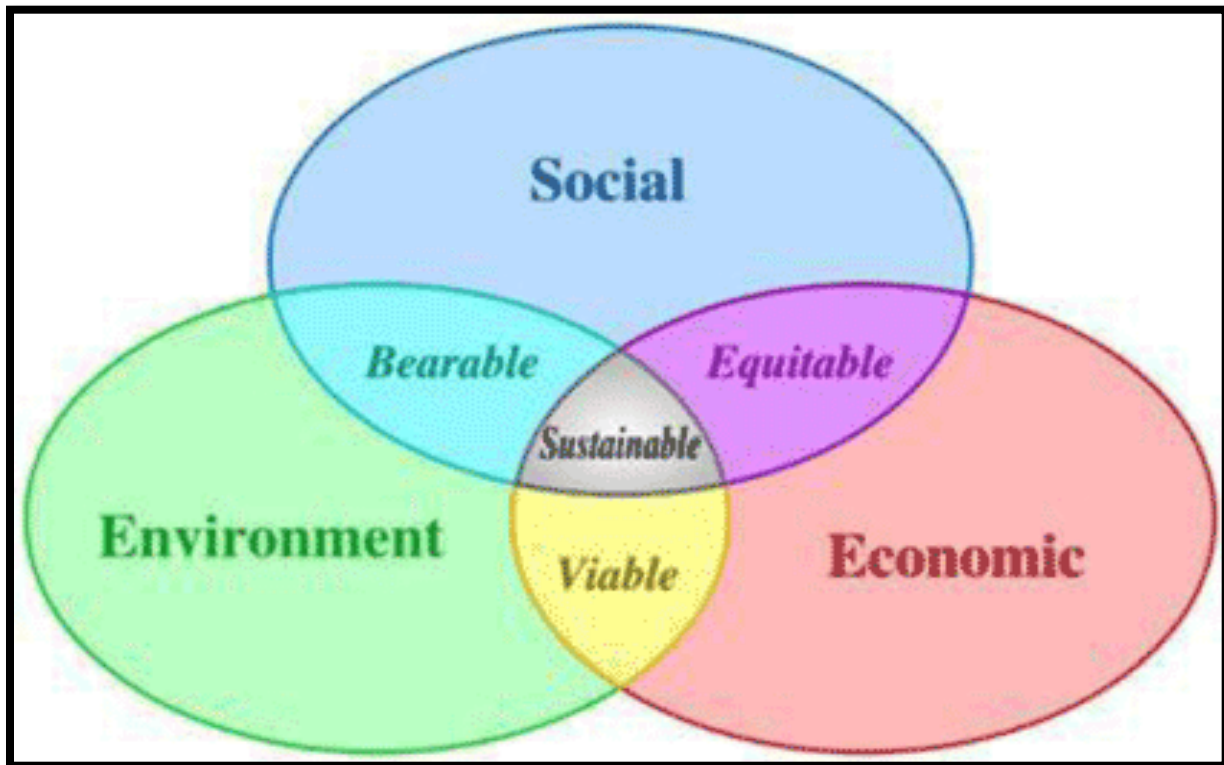
Inglehart and Welzel (2005) propound that the concept of sustainable development replaced some venerated conceptions of development such as the perception that development is economic growth, modernity and many others. Essentially, the sustainable development approach views that there is an interconnection between social, economic and environmental problems currently troubling the world. Further, Hopper (2012) stresses that the paradigm observes that environmental shocks such as droughts, famines, floods, earthquakes and many other natural catastrophes are often triggered by unwise human activities and these often hits hardest on the poor people of the world. To this end, the sustainable development approach advocates for the adoption of development strategies which preserves the environment while furthering and satisfying people's developmental needs.

The sustainable development paradigm stresses that development should not be attained at the detriment of the natural environment neither should environmental preservation undermine human development. The theory advocates that when making developmental decisions, the impact of such development on the environment should be considered as paramount. Furthermore Willis (2011) mentions that the sustainable development paradigm is envisioned to act as an international, national and local strategy, policy framework and benchmark of development. In this context, Inglehart and Welzel (2005) posits that the concept of sustainable development advocates for development strategies which ensures that current developmental approaches will not in any way encroach on the ability of future generations to sustain their lives.

In addition, the European Economic Area (EEA) (2006) report highlights that the sustainable development paradigm is an approach of planning and decision making

aimed at achieving lasting development. The report posits that sustainable development focuses on three dimensions; social, economic and environmental development and sustainability. The paradigm envisages a long term plan for development through harmonization of social, economic and environmental activities (EEA, 2006). The following diagram (figure 5) shows the three dimensions of sustainability and their interaction.

Figure 5: The Relationship between the Three Dimensions of Sustainability



Source: Martin (2012)

The EEA (2006) outlines three principles central to sustainable development: Firstly, the perspective observes that the environment is the basis of all development and protecting it is the genesis of sustained livelihoods. Secondly, the economy is conceived

as the tool through which sustainable development can be achieved. Lastly, all the benefits which accrue to any society through economic accumulation and improved livelihoods are the targets of sustainable development (EEA 2006). Essentially, the theory stresses the need to strike a balance between various facets of development to ensure sustainability. It stresses the importance of engaging people and assisting them to appreciate not only the value of development but also the cost of such development on the environment. In this light, the sustainable development approach, advocates that development should be controlled so as to ensure that the benefits enjoyed by the current generation will not obscure the ability of future generations from sustaining their needs.

Tietenberg and Lewis, (2010) argue that since the era of the modernization and dependency theorization of development, economic growth has always been identified as the basis of all development. However, they established that while growth is pertinent in the process of development, if viewed in isolation of efficiency and sustainability it ceases to be the engine of development. Peet (1999) argues that the driver of the economic development is economic efficiency measured against pareto optimality. By definition, pareto optimality is a state of resource allocation in which it is impossible to make any one individual better off without making at least one individual worse off. Redistribution of proceeds from development to ensure lateral development of the underprivileged and the socially vulnerable is the basis of the sustainable development theory.

The sustainable development paradigm can be extended to cover more issues beyond the environment. Chambers and Conway (1991) argue that the paradigm can be

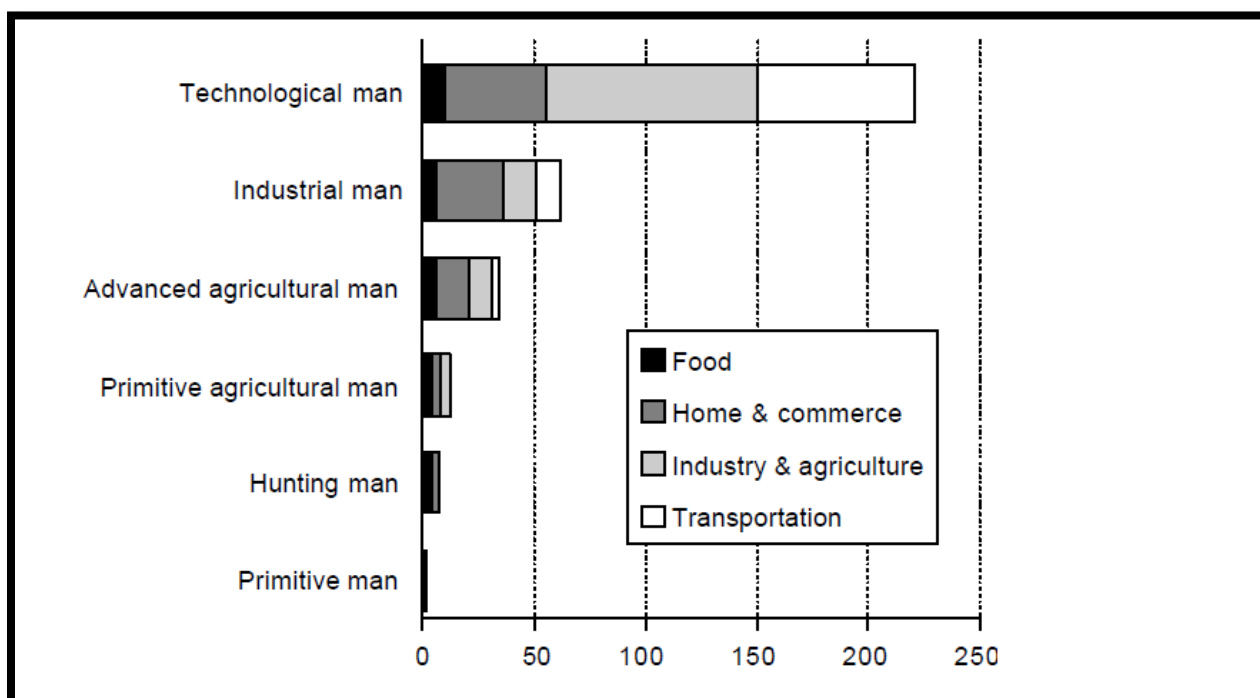
configured to explain fundamental social aspects in the social arena thus they referred to social sustainability. In this light, sustainability is conceived in the context of people's capability to cope with environmentally induced stress and shocks, dynamic livelihood capabilities and intergenerational sustainability (Chambers and Conway 1991).

The interplay between the modernization theory and the sustainable development approach allows for the development of a moderate overlapping theory which takes into account the various facets of development and attempt to reposition development in the trajectory and ambiance of available social, economic, cultural and environmental resources. In the following section an attempt to develop a theory on energy and sustainable development which borrows from the modernization theory and the sustainable development approach is made.

2.5. Towards a Theory of Energy and Sustainable Development

The concept of sustainable energy entails the utilization of energy sources which permit the earth to sustain balanced, healthy ecosystems and human lives (Willis 2011). The International Energy Agency (2003) holds that energy is an essential component of a well-functioning society. The rate and degree at which modern energy services are used in different societies often determines the levels of human development in such society. The following graph (figure 6) is an illustration of how consumption of efficient and cleaner modern energy services impact on overall human development.

Figure 6: Stages of Human Development and Energy Consumption



Source: Cook (1976) cited in Ogunlade and Youba (2002).

Essentially, it is now being increasingly accepted that access to modern energy services is key to development and poverty alleviation. To substantiate on this view, Ogunlade, and Youba (2002) point out that modern energy services inform the pace of industrialization and enhance the possibility of human development as indicated in figure above. They argue that energy is essential in hospitals, schools, in lighting and heating in homes, enabling the utilization of modern technology in agriculture, food processing and other activities which help to improve the lives of people. On the same note, Mapako and Prasad (2007) pose that modern energy services particularly electricity effectively reduce the cost of acquiring energy services. They further mention that households which utilize electricity save more income as compared to those which depend on traditional energy resources.

Willis (2011) observes that from the perspective of sustainable development, utilization of modern energy services has a far reaching environmental preservation merit as compared to the utilization of traditional energy services. Traditional energy sources such as wood, coal and animal waste has a deleterious effect on the environment (Moyo et al 1999). Many people in developing countries depend on traditional energy sources and this places them at a greater environmental jeopardy related to environmental changes in ways which they cannot control. Moreover, Ogunlade and Youba (2002) opine that the greatest demerit of utilizing traditional energy resources is that it is highly inefficient, which means more energy is lost per unit mass as compared to modern energy services in doing a similar task. Gaye (2007) concludes that without changing the current energy regime in developing countries, it is difficult to have social and economic break through.

Gallopín (2003) asserts that while the sustainable development approach is one of the most decorated and adopted developmental approach in the world; it has its pitfalls. Critics have observed with concern that the sustainable development approach has some serious flaws in its conceptualization of the objectives of development. There is often is no clarity as to what sustainable development should endeavor (Gallopín 2003). In this light, Tietenberg and Lewis (2010) opine that because of the lack of objectivity and clarity, the theory has become very elusive and ambiguous. More so, Gallopín (2003) argues that the central concern of the theory which is focused on preserving natural resources for the sake of future generations is highly unfounded, as no one can effectively predict the needs of future generations. To add to this, Tietenberg and Lewis (2010) opine that society has always been evolving, and most of the resources which

we use today, where not relevant to past generations. In this context, needs of future generations cannot be effectively validated thus they cannot be prioritized.

Gallopin (2003) criticizes the mainstream sustainable development theorists' rejection of the fact that environmental conservation constrains development or that development necessarily means environmental pollution. In fact, Gallopin (2003) argues that the paradigm has failed to acknowledge that there is no change in the quality of people's lives that comes independent of environmental exploitation. Hopper (2012) objects that there is no possibility of achieving sustainable growth without disturbing the free flow of natural ecosystems. In addition, Gallopin (2003) argues that there are flaws in the characterization of poverty and environmental degradation. He refutes the perception that there is a correlation between environmental degradation and poverty.

It is now apparent from the discussion above that the two theoretical perspectives outlined have some differences in the manner in which they conceptualize the notion of development and how such development can be achieved. The modernization perspective emphasized the importance of importing modern technology and adopting developmental approaches used by developed countries so as to achieve a state of development. The modernization perspective, further underscored the view that development is linear and immanent hence underdeveloped societies need to modernize so as to become developed. In contrast, the sustainable development paradigm emphasized the importance of controlling the interaction between the environment, human activity and achievement of needs. The sustainable development stressed that in no way should human developmental processes, policies and activities undermine environmental serenity. Notwithstanding some criticisms of the two theories,

their combination in this research provides a solid and comprehensive theoretical framework from which the research will benefit immensely.

The modernization theory demonstrated that certain apparatus are important in the process of development and are definitive of the pace at which modernization can be achieved. The theory emphasized the importance of utilizing technology to achieve a state of development. Operationally, in this research, the modernization theory will be valuable in explaining the importance of modern energy services to the achievement of human social and economic development. The modernization paradigm will also provide an extensive frame of reference from which cultural, social, psychological, geographical, economic, infrastructural and other endogenous factors impinging on development will be assessed. It is the perception of modernization theorists that endogenous factors in developing countries are responsible for the current developmental deadlock.

The modernization theory will also assist the researcher to understand the relationship between access to modern energy services, use of technology and ultimately human development. As has been noted earlier, the modernization theory assumes that when people have increased access to modern technology, they can increase their productivity. More so, the modernization theory propounds that to achieve development, societies must adopt a capitalistic mode of production in which production is for commercial purposes. It is against this background that the research will explore the dynamics amongst various energy users with the aim of understanding if the type of energy they use determines the of their scale production.

As has been discussed earlier, the modernization theory is confronted with well-founded criticisms. Critiques have argued that the theory pays no attention to environmental damages which is synonymous with economic growth. Its thrust is on economic development without regard to the cost of such development on the environment and people. In spite of these well documented weaknesses, the theory gives a clear outlook on what is imperative in the process of development and poverty alleviation. It clearly locates the research in the context of technology and energy which are at the heart of this study. The theory elucidates on how economic, political, cultural, social, including values and beliefs can be transformed through modernization and how these can influence development.

Most of the apparatus of modernity which are emphasized in the modernization theory are enabled by modern energy services. This places energy at a very competitive position in the process of development. Having recognized the special niche which energy occupies in development and in the process of ensuring equitable service delivery, the challenge becomes that of ensuring an even flow of energy without destabilizing the environment. Ensuring that the cost and efficacy of modern energy services is accepted and appreciated by local people is the challenge which needs to be tackled. The sustainable development approach provides a competitive frame of reference in showing how developmental projects can benefit the people and remains friendly to the environment. In this case, the modernization theory will lay the basis of how energy can be harnessed in Zimbabwe towards meeting the goals of development as prioritized by the state. On the other hand, the sustainable development approach

will illustrate the manner in which a balance between nature and human activities can be achieved in pursuit to the attainment of MDGs.

The sustainable development paradigm upholds the conviction that development is anchored in the use of modern tools but stressed the importance of managing these apparatus of development to ensure that society strikes a balance between resource utilization and environmental sustainability. The sustainable development paradigm will be of immense value in aiding the conceptualization of development as provided for by the modernization theory. The sustainable development theory envisions an empowered society in which local people will be capacitated to take control over their lives. Hopper (2012) mentions that the challenge associated with modernizing societies is that they focus solely on increasing the GDP which is only shared amongst a few elite. In this light, the sustainable development approach becomes a redistributive strategy which advocates for the inclusion and consideration of the poor. Apparently, making available modern energy services without putting in place a strategy of ensuring that the poor will access and afford it will not in any way foster any meaningful development.

More so, the sustainable development paradigm observes that development should set people free from all forms of bondage. The paradigm asserts that free people are more productive and they can easily participate within their economies. Inglehart and Welzel (2005) add that if democracy underlies development initiatives, governments, donor organizations or any other institution under which developmental projects are implemented, can gain social capital and legitimacy hence such projects become sustainable.

The sustainable development approach offers a good frame of reference in explaining the effects of climate change on development. Research has shown that the continued use of fossil fuels can in the long run trigger unacceptable changes in the climate. Obviously, dependency on wood fuel have serious impacts on various facets of the environment and human life including depletion of natural woodlands, causing air pollution which can amount to climate changes and ultimately, impacting on the health of people. The sustainable development approach is also equally important in locating the position of people in the process of development. Apparently, development which does not transform the quality of people's lives ceases to be appreciated and is often revolted against. The sustainable development emphasizes on the need for development which respects democracy and the rule of law. It upholds cultural and social knowledge systems of the people and their values. These elements of the theory are invaluable in this research as they allow for an impartial exploration of the society, including the meanings which they attach to their circumstances and this will provide a good and sustained frame of defining and understanding the nature and scope of energy poverty in Zimbabwe.

CHAPTER 3

Research Methodology

3.1. Introduction

The previous chapter extensively dealt with literature review and theoretical underpinnings upon which this research is based. This chapter addresses the practical aspects of the study through giving an in-depth exploration of methodological techniques and approaches which used in gathering data towards explaining the role of modern energy in the development arena. The chapter will among other things give an overview of the research domain before delving into the core processes of data collection, description of the target population, description of the sample, sampling techniques, data analysis methods and processes as well as ethical considerations.

Before delving into the methodological and descriptive narratives of the study, it is pertinent to discuss the rationale behind choosing Dewedzo as the study area. Dewedzo was chosen in this study because it exhibits extensive energy dynamics which are typical of most rural communities in Zimbabwe. The majority of households in the study area do not have access to electricity or any other modern energy services which is typical of energy poverty. According to Creswell (2007), when conducting a research, the onus is upon the researcher to select a sample which is reflective of the vast majority of the entire population. While the problem of energy is wide spread in Zimbabwe, Dewedzo presents a good sample for analyzing rural energy poverty on

rural transformation and the attainment of MDGs because it has various energy and production dynamics from which the research will immensely benefit.

3.2. Description of the Study Area

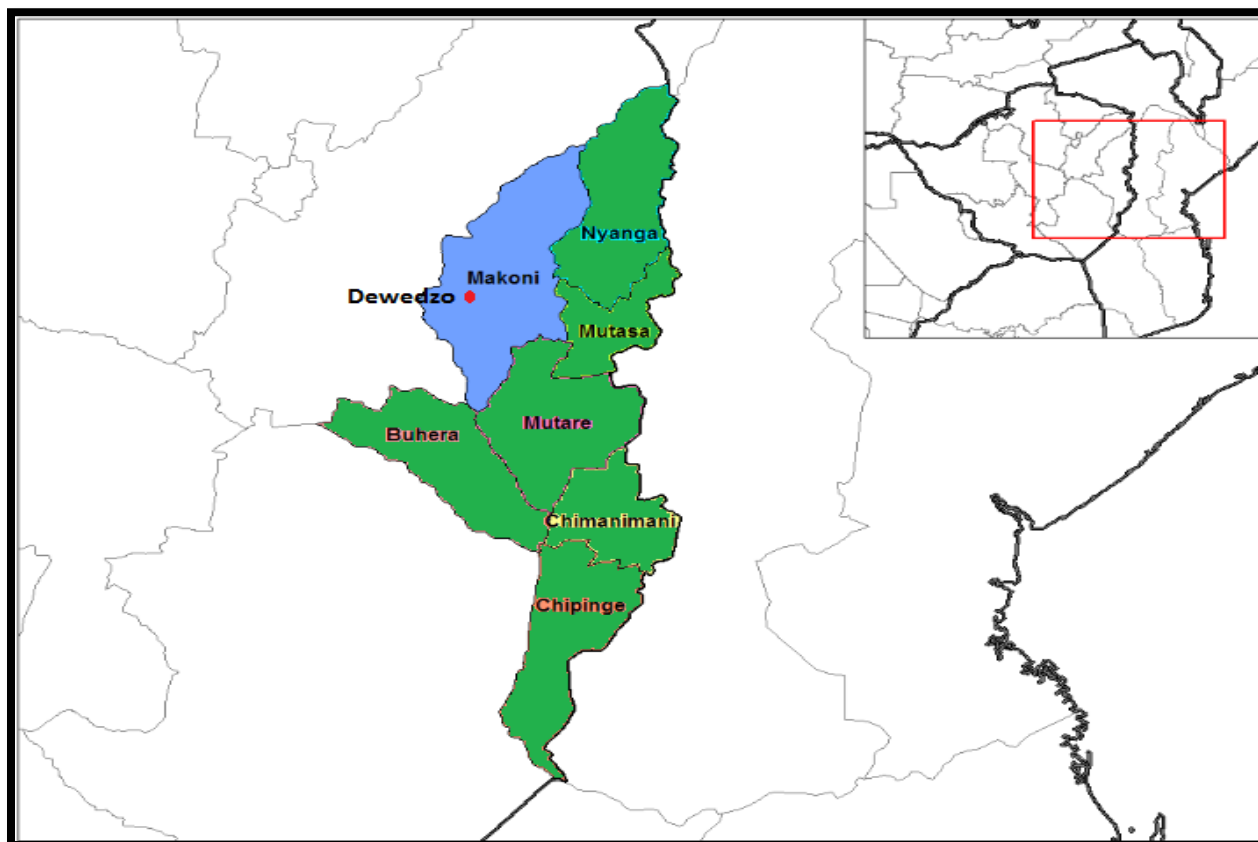
The research was conducted in Dewedzo communal area in Zimbabwe. Dewedzo is located in the Eastern Province of Zimbabwe called Manicaland and falls under the jurisdiction of Makoni west constituency. The district covers seven wards including Matsika, Masvosva, Dewedzo, St Theresa, Bwekerwa and Tsanzaguru (Hansard 2001). The capital of the country is Harare and other major urban centers include Bulawayo, Gweru, Masvingo, Chitungwiza and Mutare. Notably, Mutare is the provincial capital of Manicaland Province and it assumes all major administrative functions for the seven districts of the Province which include Buhera, Chimanimani, Chipinge, Makoni, Mutare, Mutasa, and Nyanga (Utete; 2003). Dewedzo relies on Rusape Township for commercial services and other minor administrative functions including services such as banking, retail, major medical needs and others. The Hansard (2001) estimates that Makoni West constituency in which Dewedzo is located has a total population of 46 528. Apparently the Manicaland Province is largely dominated by females who constitute 52% of the population while males constitute 48% (Central Statistical Office (CSO) (2012).

3.2.1. Geography

Manicaland province is located in the Eastern part of Zimbabwe. The Province shares a national border with Mozambique in the East of the country. A mountain range stretching for over 300km forms the border with Mozambique. The famous mountain

range includes mount Nyangani located in the north, Mount Vumba in the middle and Chimanimani which forms a rain shadow in the South (Samimi and Wagensel 1999). These mountains form what is popularly known in Zimbabwean geography as the Eastern Highlands where the Manyika people hail from (Chimonyo, Mungure and Scott 2010). The topography of the province is largely mountainous with altitude varying from 900m in the low lying areas to 2593m at the peak of mount Nyangani (Toro 2013). Mutarazi falls which is 762m in height and is ranked as the second highest falls in Africa is one of the significant topographical features in the province. In addition, the recently discovered Chiyadzwa diamond fields is believed to be one of the world's richest diamond sites and is now one of the country's leading income generating venture(Chimonyo, Mungure and Scott 2010).However, Dewedzo is located is located about 70km from Rusape township along a dust road in the Western direction. The area lies in the marginal areas of the Manicaland Province closer to Mashonaland East Province. Dewedzo encompasses several villages such as Mutendebvure, Ngwere, Chirisa, Mvindi, NeDewedzo, Chikuse, Tswatswa, as well as 12 business centers (Hansard 2001). The most pronounced service center in Dewedzo is the St. Bedes growth point which is at the center of the NeDewedzo chiefdom. More so, one of the most outstanding topographical feature of Dewedzo are the Chinyenyawana Hills, commonly referred to as the Dewedzo hills famous their outstanding heights against surrounding low lying areas such as Masvosva, Matsika and Chiduku. Moreover, Dewedzo hills are famous because of the historical myth that the hills set themselves alight annually. Figure 7 below shows the map of the Manicaland Province, the Makoni district is selected and the position of Dewedzo is shown.

Figure 7: Districts of Manicaland with Makoni district and the Position of Dewedzo Shown



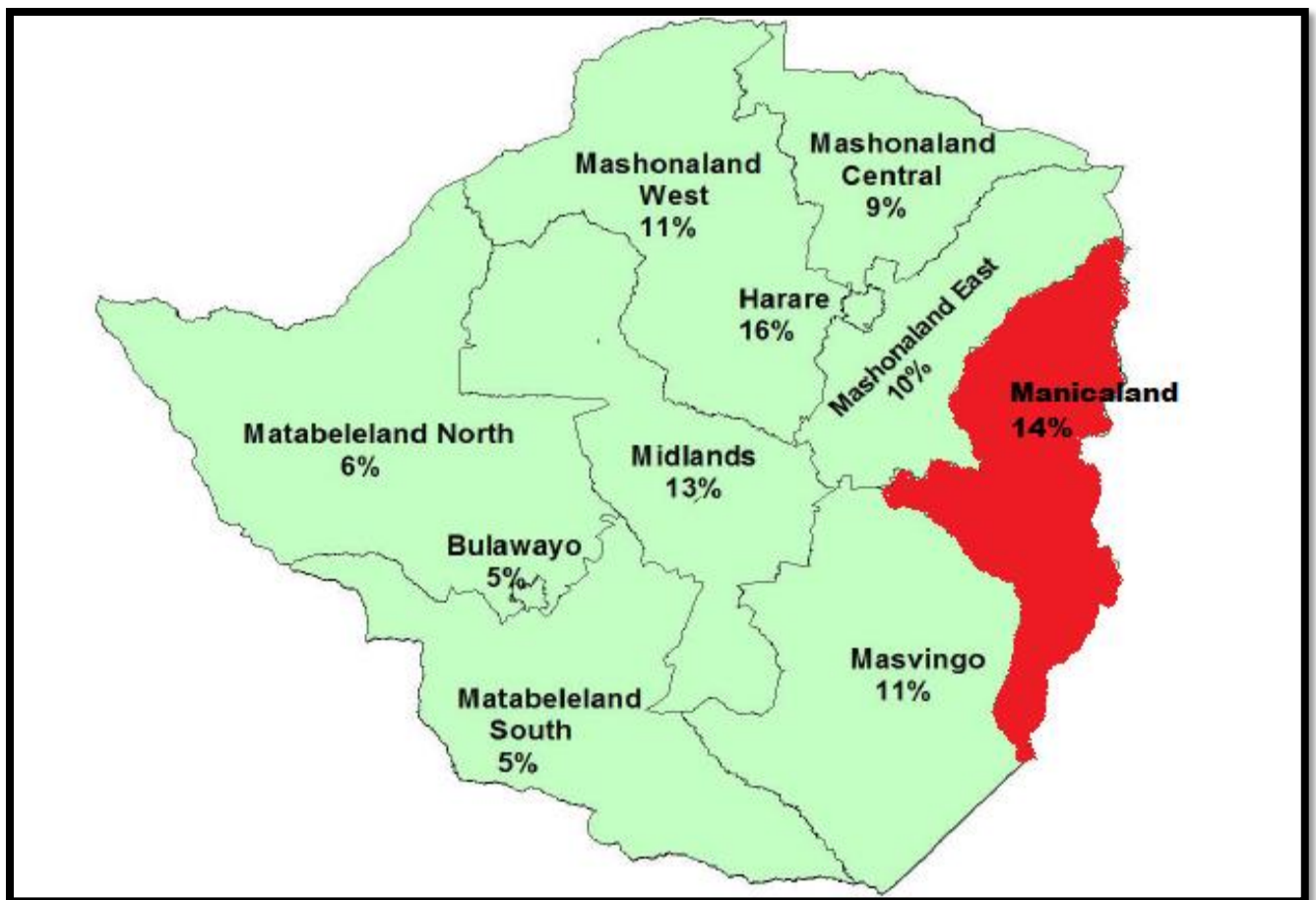
Source: Wikipedia (2014)

3.3. Population

According to the Zimbabwe National Statistics Agency (Zimstats) (2012) census report, Zimbabwe has a total population of 12 973 808. The population is composed of 6 234 931 males and 6 738 877 females representing 48.1% and 51.9% respectively. The country's population is accommodated in 3 076 222 households implying an average household size of 4.2 persons per household. On average the country has a population density of 33 people per square km. The 2012 Zimbabwe census figures indicate that Harare Province has the highest population; it constitutes 16% of the total population,

followed by Manicaland which accounts for 14% of total national population. Midlands accommodates 13% of the national population, Masvingo and Mashonaland West accounts for 11% each, while Mashonaland East has 10% of the national population. Low population percentages are in Mashonaland Central (9%), Matabeleland North (6%) and Bulawayo and Matabeleland South which had 5% each (Zimstats2012). Figure 8 is an extract from the Zimbabwe National Statistics Agency (2012) national census report showing the distribution of population in each Province, the Manicaland Province is highlighted.

Figure 8: Map of Zimbabwe Showing Population Distribution, Manicaland Province is selected



Source: Zimstats (2012) census report

3.3.1. Population Profile for Manicaland Province

Statistically, Manicaland province is the second largest in terms of population. The Province is largely rural, 83% of its total population are domiciled in rural areas where they are mainly engaged in agricultural activities (Poverty Reduction Forum Trust 2011). The Province has a total land area of 36459sq/km and a total of 175500 people constituting roughly 14% of the national population. Manicaland Province is largely dominated by females than males. There are 831762 males and 923238 females resulting in a male-female ration of 90 males per 100 females. In terms of population density, the province has an average of 48 people per sq/km, and it is the third densely populated Province following Harare with 2406 people per sq/km and Bulawayo with 1369 people per sq/km. Galang (2002) points out that in some parts of Manicaland Province, people and animal populations are overcrowded such that some people have resorted to settle in hilly or mountainous areas which traditionally were used for animal grazing.

3.3.2. People, Language, Religion and Culture

Zimbabwe is a multi-ethnic and racial country which comprises of a dynamic population. However the dominant racial group in the country is that of blacks. Some of the ethnic groups amongst blacks include the Shona, Ndebele, Tonga, Chewa and Venda. Notably, Shona is the dominant ethnic denomination. According to FAO (2001), about 74% of Zimbabwe's population is Shona speaking, 18% Ndebele speaking, 4% speak English while the other 4% speak other languages. Other races available in Zimbabwe in significant numbers include the Whites, Indians, Coloreds and Chinese people. Shona as the major language and culture in Zimbabwe is used and practiced in at least

6 out the 10 Provinces of the country (FAO 2001). More so, Zimbabwe uses English as its medium of communication in business and for other public events.

Zimbabwe is largely a Christian society (FAO 2011). Some of the dominant church denominations in Zimbabwe include Methodist, Roman Catholic and Anglican. In the recent past, there has been an increase in the number of Pentecostal churches such as the Apostolic Faith Mission Church, ZAOGA, United Family International Ministries and many other apostolic sects. Apostolic sects which promote polygamy are more pronounced in Manicaland Province in areas such as Chipinge, Mutasa and parts of Bhuhera. In Dewedzo, the population is largely Christian and dominant church denominations in the area include Anglican, Roman Catholic and Apostolic sects. On the other hand, traditional cultures and beliefs exist although on a limited scale. Traditional leaders, usually, head men, kraal heads, chiefs, and kings are the custodians of traditional values and cultures.

Political power in Dewedzo is shared between main stream political parties and traditional leadership. The latter mainly uses customary laws to control and preside over communal meetings and disputes. On the other hand, mainstream politicians rely on the constitutional or civil law to administrate and govern. In the context of the shared political platforms, visible political offices in Dewedzo are that of the chief, village heads and that of the ward councilor. The ward councilor is responsible for communicating and facilitating developmental programmes in the ward on behalf of the central government. On the other hand, the chief and the village heads are responsible for sharing communal resources including land and settling communal disputes as well as presiding over traditional rituals in the community.

3.4. Road Infrastructure in Dewedzo

The study area is accessible through gravel roads which extend to adjacent urban centers like Rusape, Marondera and Wedza. Notably, the road infrastructures in Dewedzo are in a poor state of disrepair. The gravel roads are severely eroded and have deep pot holes. Because of the poor state of the roads, it is very difficult to get transport to or from Dewedzo. People in Dewedzo really on few privately owned public transport which often plies their routes. The challenge of transport in Dewedzo emanates from the dislike of most transport operators to service the gravel roads as they cause damages to their vehicles. More so, due to scarcity of transport in the area, the cost of transport is very high. SAPES (2001) perceives that the poor state of road infrastructure and the high cost of transport in rural areas of Zimbabwe is one of the factors disincentivising productivity.

3.5. Communication Infrastructure

A decade of serious economic downturn in Zimbabwe has resulted in a significant collapse of the country's communication infrastructure. The Central Intelligence Agency (CIA) (2002) notes that Zimbabwe at one point in history had one of the best telephone and communication network systems in the continent. The country's fixed telephone system serviced by Tel One which is a public utility company reportedly suffered serious fiscal challenges between the 2000 and 2009 resulting in poor maintenance of service lines (Freedom House 2012). In addition to the fixed telephone services, Zimbabwe has three operating mobile telephone service providers namely Telecel, NetOne and ECONET wireless. The advent of mobile telephone systems made it easier for most rural people to have access to telephone services. All Provinces of the country have

access to internet services. The freedom House (2012) states that as of 2011, internet penetration in Zimbabwe was at 16%, however it was largely available in urban areas where rural people have to travel considerable distances to get access to it. The greatest challenge as it pertains communication in Zimbabwe and in the study area in specific is poor access to electricity. Generally, the ability of rural people to use mobile cell phones is dependent on the household's access to modern energy services to charge the mobile phone. With respect to network coverage, Dewedzo recently benefited from the Rural Electrification Programme and this also resulted in the area benefiting from the Network boosters built by ECONET and NetOne in their area. More so, rural areas in Zimbabwe are still relying on regular mails as a means of communication. Mails are sent and received through the postal addresses of local public schools and local post offices.

3.6. Health Facilities and Services in the Study Area

One of the commonly acknowledged achievements of the Zimbabwean government since independence relates to the improvement made in the health and educational sectors (Hansard 2001). The government developed an extensive health network in previously disenfranchised areas especially rural areas. Ministry of Health and Child Welfare (2010) writes that the Zimbabwean government built a clinic or hospital within a radius of 5km from each other. The Hansard (2001) states that since the inception of the black government, 456 health centers, 612 rural hospitals and 25 district hospitals were constructed or upgraded. However Chikanda (2005) poses that public health institutions in Zimbabwe are paralyzed due to lack of adequate drugs and critical shortage of staff. Dewedzo has one rural hospital located near St Bedes growth point.

The hospital has six patient beds and is serviced by one nonresident doctor and 7 nurses (Hansard 2001).

3.7. Education

Zimbabwe is well reputable in terms of its education systems in the continent. The World Bank (2003) notes that the country has literacy rate of 91% which is the best in the whole of Africa. Dewedzo relies on public schools for the education of children. There are no tertiary institutions for education in the area. Public primary schools in Dewedzo include Mutendebvure, Chimuduro, Chiunya, Maungwe, St Vincent, Chizawana, Tswatswa and Dowa. Secondary schools in the area include Nyahawa, Dowa, and Dewedzo secondary school.

3.8. Agriculture

Zimbabwe has dynamic climatic conditions which changes from one region to another. Notably, the study area falls within region 3 which has moderate to high rainfall patterns which favors crop production. Dewedzo is in Natural Region III which receives between 650-750 mm of rainfall annually. The communal area is predominantly inhabited by smallholder farmers whose average landholding is below 4 hectares per household (Poverty Reduction Forum Trust 2011). The soils are generally coarse sands derived from granite. More so, maize and sweet potatoes are the major crops grown through rain-fed agriculture, although a wide range of food crops mainly for subsistence are also produced. The temperate climate in the area facilitates market gardening which is often practices at a small scale. The Hansard (2001) mentions that ward 14 which encompass all the villages of Dewedzo have 2 dip tanks and a total census of between

803 and 1976 cattle. Animal production is mainly focused on producing draft power, manure, meat and milk. Some of the animals reared in Dewedzo include cattle, goats and pigs. Being predominantly an agro based society, Dewedzo is famous for its extensive production of sweet potatoes and is believed to be one of the largest producers of the product (Hansard 2001). Due to the perpetually shrinking economy of the country; most rural communities in Zimbabwe are at the peril of severe food shortages as they can no longer efficiently produce. Economic hardships in Zimbabwe have resulted in many small holder farmers in Dewedzo switching to cash crop production. SAPES (2001) notes that in most communal areas of Zimbabwe, people are now focusing on producing tobacco and cotton thus exposing households to critical food security challenges. On that note, FAO (2011) poses that the shift towards cash production by most peasant farmers in developing countries has resulted in serious food insecurity amongst rural folks.

3.9. Research Methodology

There are several approaches to conducting research social research. Sherpard (2002) refers to the quantitative, qualitative, historical, feminist research methodologies as some of the methodologies used in social research. Babbie et al (2001) mention that the choice of a research methodology for each research instance should be based on what the researcher intends to investigate rather than being dictated by a mere commitment to a paradigm. This study used a qualitative research methodology. Qualitative research is concerned with the social meaning of phenomena in its natural environment. Denzin and Lincoln (2000) pose that a qualitative methodology perceives that reality is socially constructed and is always unique and specific to each scenario. He refutes the idea that

social phenomena can be generalized or predicted. Babbie et al (2001) discuss the notion of qualitative research as a type of research which takes the insider perspective of social action as its point of departure.

The focus of a qualitative research methodology is to describe and understand social phenomena rather than trying to explain them. Welman, Kruger and Mitchell (2006: 188) refers to Van Maanen (1979) and asserted that “qualitative research is an umbrella phrase covering an array of interpretive techniques, which seek to describe, decode, translate, and otherwise come to terms with the meaning of naturally occurring phenomena in the social world”. Rajasker, Philominathan, and Chinnathambi (2006) assert that a qualitative methodology takes as its point of departure the prioritization of the manner in which people constructs meaning out of their circumstances. From a similar perspective, Creswell (2009) mentions that qualitative research maintains that there are several truths pertaining to the same phenomena as may be perceived by different individuals and all these need to be captured if the researcher is to unravel the objective truth of a particular phenomenon.

Sherpard (2002) differentiates between research methodology and research methods. He asserts that the latter is a broad framework which includes some technical aspects of data gathering, analysis and interpretation. On the other hand, research methods are the tools or components used in the data gathering and interpretation. Consequently, Nueman (2011) writes that methods used in qualitative data collection include the use of “photographs, interviews, observations, biographies, videos, documents, drawings, diaries, memoirs, newspapers, historical documents and autobiographies.

The use of a qualitative methodology in this research offered several advantages and allowed for the broadening of the scope of understanding the niche occupied by modern energy services in the process of achieving sustainable development. The methodology allowed for the exploration of insights, traditions and understandings of participants regarding the impact of modern energy services which would have been unobtainable through other methodologies such as the quantitative methodology. Further, Rajasker, Philominathan, and Chinnathambi (2006) underscores that a qualitative methodology emphasizes the imperativeness of studying phenomena in its natural environments; this helped in reducing bias and enhanced the collection of culturally, economically, socially and religiously apt data.

Creswell (2009) postulates that qualitative methods offer a rich reservoir of meaning, interpretation and are also good at answering critical dimensions of a research problem such as 'why' and 'how'. Notably, this study was focused on understanding how and why modern energy services or lack of it affects human and economic development in Dewedzo. These descriptive dimensions of research were unanswerable using other methodologies. Creswell (2009) writes that qualitative research is crucial in preserving the integrity and meaning of collected data. He asserts that unlike in quantitative research where large amounts of data is converted to numerical values and compressed thereby losing its original nature, qualitative methods, capture, analyze and report data verbatim without major changes in its content. This aspect of a qualitative methodology allowed the capture and subsequent reporting of research findings in the best possible words of the participants.

The use of a qualitative methodology in this research was useful in this research as it was convenient in gathering relevant data regarding people's opinions and experiences on the importance of modern energy services on human, social and economic development. The use of interviews, allowed the researcher to probe on some conscious and unconscious beliefs, practices relating to the use of energy and its impacts on human development. Moreover, the methodology enabled the research to be grounded in a rich natural social, cultural and economic context where people expressed themselves naturally. This enabled the researcher to identify and follow up on pertinent issues surrounding the use of energy which had not been initially included in the interview guide.

Klein and Myers (1999) claim that qualitative research gives effect to socially constructed reality. They argue that in qualitative research, people are the prime sources of reality, thus the researcher became a vehicle through which reality is drawn from the sources. In this light, through interviews, the researcher was able to tap on people's real experiences. Further, a qualitative methodology brought the researcher closer to the subjects of the research.

However, there are some challenges and disadvantages associated with using a qualitative methodology. Neuman (2011) mentions that one of the disadvantages of using a qualitative methodology is the difficulty it has in detecting, reducing or preventing researcher induced bias. The methods of qualitative research heavily rely on the researcher as the primary instrument of data collection and interpretation; this subjects the research to the researcher's own value judgments, and prejudices. Further, there is also concern related to the reliability and generalizability of the research output.

Babbie et al (2001) note that because of the limited instances or cases tested in qualitative research, it is difficult to effectively generalize beyond the scope of the society, community or group tested. Worse still, Sherpard (2002) pose that the limited cases tested makes the research to be susceptible to prejudices, subjectivity and selective perceptions.

3.9.1. Research instruments and Research design

A research design is a master plan or a blue print of how the researcher envisages carrying in out the research. Grinnel (1987) conceptualizes research design as the procedure which encompasses the specific steps taken by the researcher towards answering the research questions. In this study, the initial step taken upon going to the field was to seek permission from the responsible authorities to carrying out the research. The authorities which were consulted in this research included Chief NeDewedzo, four head men from the villages where the research was conducted and the ward councilor of ward 14. The researcher also hired two local assistants to help in identifying the sampled households and in recording the interviews.

Interviews for the research were carried out using Shona language which is the predominant language in the study area. However people who opted to use other languages such as English or a mixture of English and Shona were accommodated. The research assistants were vital in helping the researcher in translating some of the Shona dialects which the researcher was not well versed with.

Prior arrangements and appointments were made with the participants in preparation for the interviews. The interviews were conducted at the participants' residential homes.

The choice for the venue for interviews was made in consideration of Babbie's (2001) view that conducting research in people's natural settings improves their relaxation and enhances their memory and participation. Moreover, conducting the interviews at participants' homes allowed the researcher to observe some of the energy functions, deficiencies and challenges.

After consideration of the results of timed pilot interviews, the researcher determined that each interview session would require at most 45 minutes. Denzin and Lincoln (2000) argue that when conducting research interviews, anything under half an hour is likely to be skeletal and unlikely to be valuable; while anything above one hour will be unreasonable considering that people often have their busy schedules to take care of.

3.9.2. Sampling

Babbie et al (2001: 27) note that population in research terms can be defined as including all people or items which contains the characteristics which the researcher is interested or concerned about. It is the whole from where representatives will be drawn and tested so as to draw conclusions on the larger group. In this research, the population includes the entire households of Dewedzo communal area in Zimbabwe. The characteristics which are definitive of the population to be considered in this research are any household, which generate or consume energy services.

Sampling is a systematic process of selecting a few cases from the larger population which will be subjected to a test and from which conclusions about the larger population group is drawn. Babbie et al (2001) also highlight that a sample is a finite part of a statistical population. Sampling is a process of taking a portion of a population as a

representative of the larger population (Creswell 2009). Sampling is crucial in research as it helps in downsizing the number of possible participants to fit the capacity of researcher (Denzin and Lincoln 2000). Similarly, Neuman (2011) poses that, in most instances, the population consists of too many elements which due to financial and time constrains the researcher may not be able to approach.

In this research, the size of the sample was determined basing on the need for accuracy and the degree of variation in terms of the characteristics of the population group. The sample in this study included 50 households in Dewedzo communal area. Notably, time, limited financial resources as well as capacity were some of the factors which were considered in determining the size of the sample. Among others sample characteristics which were considered in selecting the sample was gender, type of energy used, income variations and educational qualifications. The research was focused on assessing the impact of energy poverty on human development capacity. The major thrust was on how lack of efficient energy services affects the achievement of MDG1 and 3 which are two of the three priority goals selected by the Zimbabwean government.

The study used purposive sampling technique is choosing households to include in the sample. Creswell (2009) poses that purposive sampling is based on the discretion of the researcher in choosing a sample which contains characteristics from which the research will benefit. On that note, Neuman (2011) mentions that purposive sampling requires the researcher to have knowledge about the population and thus so as to enable him/her to select cases or samples which possess typical characteristics being sought in the study. Babbie et al (2001) elaborate that the core of purposive sampling is on making sure that

that elements which best fit the description of the research topic, aims and purpose are included in the sample. Further, Babbie et al (2001) mention that purposive sampling is done with a purpose in mind. In this research, the purpose was to select households which had access and those did not have access to modern energy services.

Purposive sampling allowed for the selection of interviewees whose experiences of using energy services contributed immensely to the aim and purpose of the study. The advantage of using purposive sampling is its ability to limit the research to only those instances which possess characteristics being sought in the study (Neuman 2011). This improves research objectivity and also reduces the financial burden. More so, because of the strict selection of cases which bore the characteristics being sought in the study, it is possible to generalize the results of the study to the wider population.

Neuman (2011) poses that purposive sampling enable the researcher to eliminate elements or instances which does not fit the criteria and description of the research objectives and aims. This makes the research process cost efficient. Creswell (2009) writes that purposive sampling gives the researcher express access to the desired elements of the study thus effectively reduce the time of the study.

However, Neuman (2011) holds that purposive sampling in research has some disadvantages which render it undesirable. He perceives that purposive sampling is undesirable because of its nature of investing the responsibility of selecting samples in the researcher, this might result in the researcher choosing wrong samples or induce his/her personal prejudices in the selection process. Sherpard (2002) adds that there is no guarantee that the outcome from the personally picked samples will bear results

which are reflective of the wider population. He further argues that each case ought to be viewed with its own merits and demerits thus purposefully selected samples may not be difficult to generalize. Moreover there is a challenge of undermining the value and influence of sub groups which are considered not relevant in the research. More so, the desire to select some specific target group in purposive sampling might result in some errors as the targeted samples might be rare or not willing to participate.

Research instruments refer to the tools or methods that the researcher uses in the process of data collection. Creswell (2009) posits that instruments of data collection include interviews, documents and visual materials. Individual interviews, focus groups observation and secondary data review are the main methods of collecting qualitative data (Neuman 2011). This research used interviews and secondary data sources as its sources of information.

3.9.3. Interviews

By definition, interviews are face to face meetings between the interviewer and the interviewee (Creswell 2007). Similarly, Babbie et al (2001) define interviewing as a qualitative research technique that includes conducting intensive face to face interviews with one or a small number of participants in order to explore their perspectives on particular subject. Creswell (2007) argues that interviews allow the researcher to gain insight on the experiences, knowledge, opinions, likes and dislikes, attitudes and motivations of the participants. The decision to use face to face interviews as opposed to sending out questionnaires was largely made in consideration of the fact that some people in the study area are illiterate thus they are not able to fill in a questionnaire. Sherpard (2002) perceives that questionnaires often have a challenge of limiting people

from freely expressing themselves. Worse still, some people do not return questionnaires or they fill them incorrectly and the researcher loses out on the information of such participants. In this study, 33 females and 17 males were interviewed, these comprised of aggregated samples of low, middle and high income earning household heads where were using different types of energy services.

Interviews are regarded as one of the handiest tools useful in gathering rich and contextualized information. Sherpard (2002) opines that interviews provide the researcher with much detailed information as compared to other methods of data collection. He asserts that in interviews both the interviewer and the interviewee are free to seek clarity on an issue and the interviewer is flexible to change their line of inquiry, follow up on interesting responses. Interviews can also be advantageous in improving easy communication especially if the interviewer and the interviewee share a similar linguistic background. In this study, both the researcher and the participants who were interviewed used Shona as their mother tongue; this removed the challenges of language barriers and fostered a relaxed and safe environment suitable mutual participation.

Semi structured interviews were used as the primary tools for eliciting data from the participants. Neuman (2011) holds that semi structured interviews are those interviews which are moderated and focused on a particular subject matter but with flexibility to explore the subject from different perspectives as might be opined by the interviewee. Semi structured interviews allow participants to express their opinions, perceptions and motives (Creswell 2007). Precisely, semi structured interviews removes the rigidity imposed by structured questionnaires which limit participants to find define their

perceptions in terms of the researcher's wording. It is possible to achieve greater reliability in research through semi structured interviews as they tap directly into people's inner thoughts and feelings, thus avoid imposition of the researcher's opinions in the research outcome (Creswell 2007).

Semi structured interviews were the most appropriate instruments in this study as they allowed for the full exploration of the participants' perceptions and experiences regarding the different types of energy they were using. The researcher used an interview schedule which contained questions and research topics which were considered pertinent in answering the initial research questions. A pre-drafted list of questions addressing the central research question was used to moderate and ensure that the interview remained within the dictates of the research aims and objectives. The interview schedule was personally administered by the researcher with the assistance of two assistants who were responsible for note taking.

However, there were some few limitations and pitfalls that can be encountered through using interviews. Babbie et al (2001) note that, interviews as technique of data collection can be time consuming. Much time was consumed in conducting interviews, transcribing them and in analyzing the results. More so, there were some Shona words which could not be easily translated or explained in English.

3.9.4. Secondary Data Review

Secondary data review was also be used as the second method of data collection. Creswell (2007) purports that secondary data review or content analysis refers to the study of the content and meaning of texts and information resources, such as books, essays, interviews, discussions, historical documents, speeches, conversations,

websites and images. On that note, Klein and Myers (1999) observe that researchers supplement participant observation and interviewing with gathering and analyzing documents produced on daily basis. Creswell (2007) describes the analysis of documents as an un-obstructive method which is rich in portraying the values and beliefs of participants in the intended setting. Secondary data such as letters, minutes of meetings, announcements, formal policy statements and other written documents are very useful in developing some understanding of both the setting or group to be studied (Barzun and Graff 2004). Grinnel (1987) argues that the greatest advantage of secondary data analysis is that it is un-obstructive and non-reactive in nature. It allows the researcher to unravel important facts about the population or area of concern without disturbing the setting of the study in any way.

In this research, secondary sources of data were imperious in revealing information regarding the statistics of human development. Government and nongovernmental organizations reports as well as newspapers were very useful in providing statistical figures of electrification, income distribution and in also revealing some of the developmental projects and programmes being pursued by the government.

3.9.5. Data Analysis

Sherpard (2002) argues that once data is captured, it is subjected to rigorous processes of analysis which force it to review its meaning which will be used either to refute or support the initial hypothesis. Essentially, data analysis involves bringing logical order and structure to collected raw data. It is a process of synthesizing the data to reveal its information regarding the initial research question (Sherpard 2002). More so, Klein and Myers (1999) argue that the central purpose of data analysis is to understand the

dynamics and constitutive elements of the collected data and to identify emergent trends or themes. In this study, data analysis involved the processes of data reduction, coding and categorizing. To simplify the process of data analysis, all the gathered data was pre-coded before it was transcribed from the field notes onto a computer. The transcribed data was then reduced by eliminating data which had no meaning or relevance to the central research question. Lastly, the reduced data was then categorized according to emerging themes, variations and trends.

The Statistical Package for Social Sciences (SPSS) was used in analyzing quantitative data. The package was very crucial in handling the otherwise confusing numerical data. It also helped in identifying emergent statistical patterns and trends. These were descriptively discussed as emerged themes. The SPSS also made it easy to identify variables such as the 'mean' 'frequency' and the 'mode' which would have been difficult to calculate manually. The analyzed statistical information were summarized and presented using graphs, tables and percentages.

CHAPTER 4

Presentation and Discussion of Results

4.1. Introduction

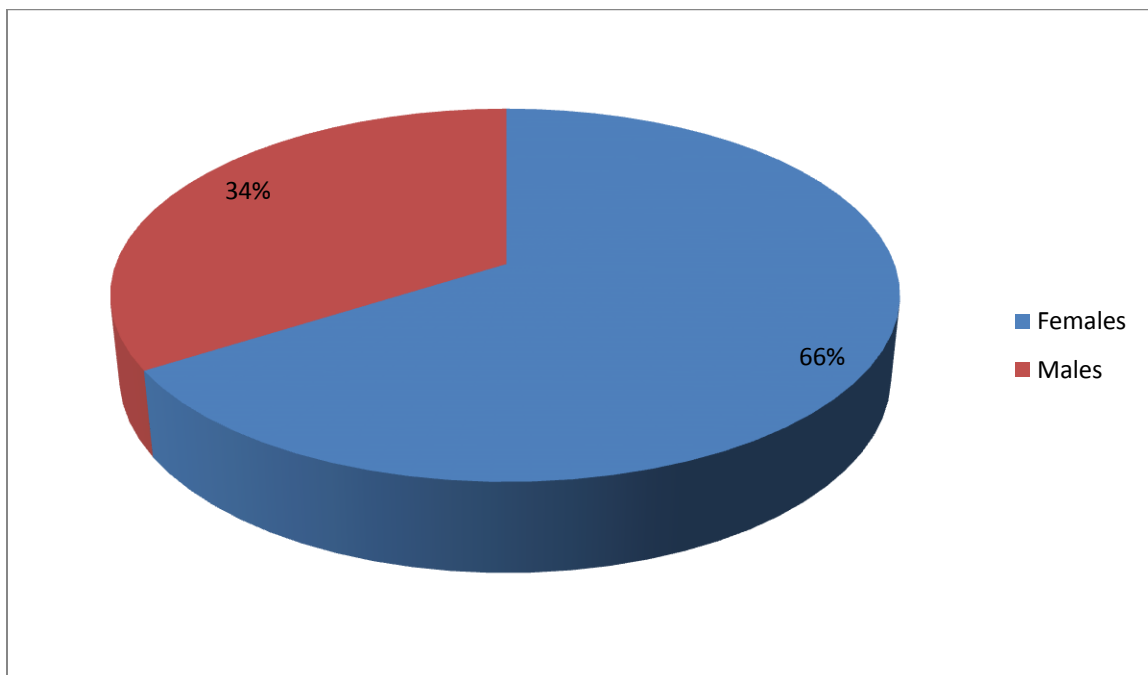
Energy poverty has been noted as a derailing factor in the process of implementing and augmenting effective developmental initiatives in developing countries. Notably, there are fears that if no alternative affordable and easily accessible energy services are made available to the poor, most developing countries will miss their MDG targets by a large margin. This chapter focuses on giving a comprehensive presentation; review and analysis of the data gathered through a survey which was conducted in Dewedzo community. The main thrust of the interviews was on ascertaining the relationship between access to sustainable energy services and human social and economic development with the main focus being placed on human development as prescribed in MDG 1 and 3. Collection of data was carried out during the month of December 2013 and January 2014. In this write up, data presentation will tap directly from field notes which were recorded during the field survey. The findings of the research are presented in the form cross tabulations, descriptive statistics encompassing percentages, graphs and frequencies.

4.2. Demographic Characteristics of the Study Area

4.2.1. Gender Stratification

Gender is increasingly being viewed as a very significant and indispensable factor in the discourse of rural poverty, social and economic inequality and accessibility of important human and economic services. In its basic form, gender can be conceptualized as the state of being male or female basing on socio cultural differentiation rather than on biological and physical constructions of gender. In this study gender was considered important as it could be reflective of the dynamics associated with accessibility of energy services. More so, gender differentiation was considered imperious as it assisted in determining the levels of gender equality and women empowerment. Participants in this research were categorized according to their genders. Figure 9 below show the stratification of gender in the study.

Figure 9: Gender Stratification in Dewedzo



The research revealed that there are more females than males in Dewedzo. Precisely, 66% of the total participants were females while 34% were males. The higher proportion of females noted in this study is not surprising as it is reflective of the Manicaland Province gender profile which indicates that the Province is largely dominated by females. The stratification and distribution of gender in Dewedzo is typical of most rural societies of Zimbabwe where most males are often based in urban areas where they are either formally or informally employed. Women are the ones who are usually left to raise children and to take care of the family's home and farm property in the rural areas. This according to Ruiters (2008) also explains the difference between male and female incomes and subsequent poverty levels which are high amongst women than men. Moseley (2007) argues that in most developing countries, the phenomenon of feminization of poverty is more visible and prevents women from actively participating and developing themselves. Women are often engaged in less economically rewarding activities and this often have a negative impact on their incomes.

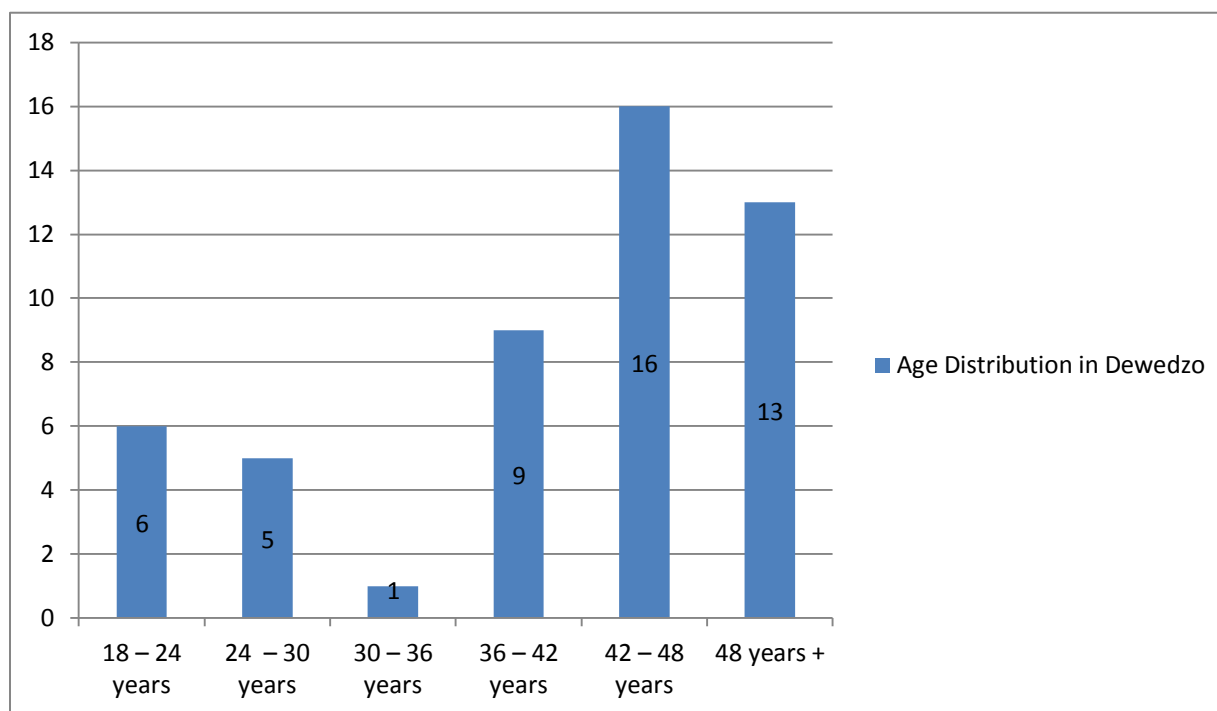
This research revealed that gender is an imperious factor in the distribution and accessibility of energy resources. Precisely, 57.1% of the male headed households which participated in this research had access to modern energy services as compared to 39.4% female headed households which had access to the same.

4.2.2. Age

In this research, there were six age categories within which the participants were categorized according to their ages. Out of the 50 sampled participants, 6 participants indicated that they were aged between 18 – 24 years. More so, 5 participants

mentioned that their ages were between 24 – 30 years. Only 1 person indicated that she was aged between 30 - 36 years, while 9 participants reviewed that they were between 36 – 42 years. Additionally, 16 participants indicated that they fell into the 42 – 48 age categories. Lastly, 13 people were above 48 years with the oldest respondent being 88 years old. Following is a bar graph (figure 10) showing the age distribution of the sampled population in the study.

Figure 10: Age Distribution in Dewedzo



The age structure of the participants in the research suggests that the community is largely dominated by an aging population. Precisely, 76% of the total sampled population was above 36 years of age. Only 24% of the population was below 36 years. The age trends noted in Dewedzo are not peculiar to people who understands population dynamics in Zimbabwe as it is a common feature of most rural communities. Apparently, in most rural communities, young people who would have finished their

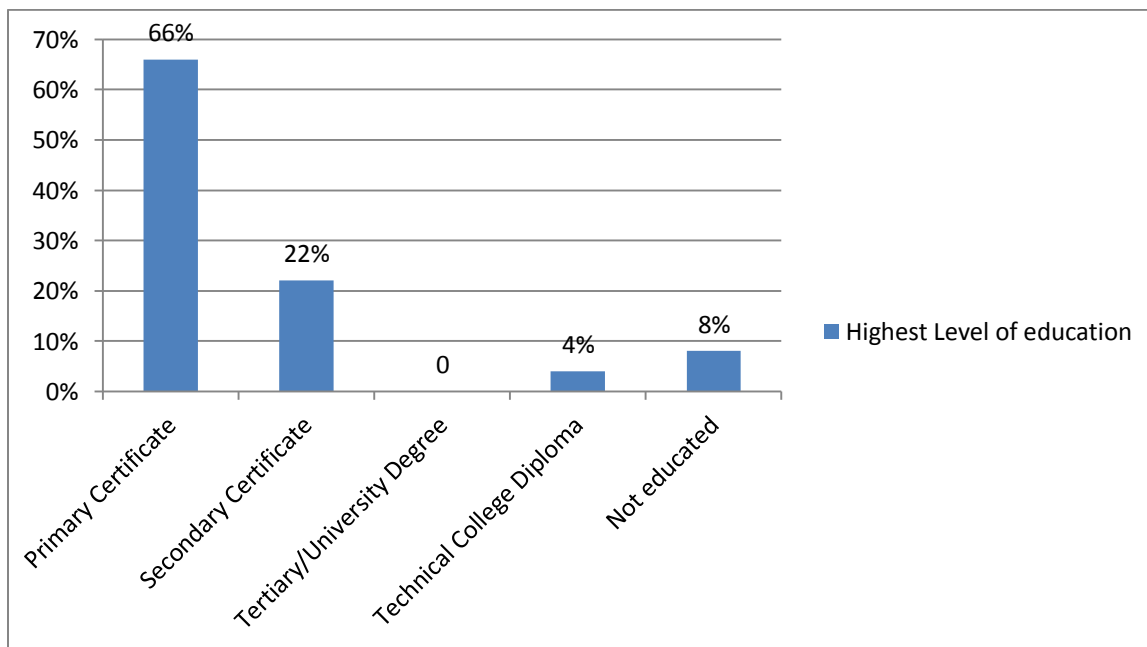
secondary schooling often migrate to urban centers such as the capital city (Harare) where they hope to secure better social and economic opportunities. Chief among the reasons why most young people prefer to live in urban areas as compared to rural areas is poor access to life enhancing services most of which cannot be accessed in rural areas due to lack of access to modern technological equipment as well as modern energy services. A reverse migration from urban to rural areas which often takes place amongst aging people who go back to rural areas to settle down and engage in agricultural activities after retirement or after complete failure to secure jobs in urban areas better explains the often high percentages of aging populations in rural areas. Migration to rural areas stands out as a last resort for the socially disadvantaged.

Ruiters (2008) points out that, aging societies face critical challenges in terms of maintaining sustainable incomes and hence their welfare is always challenged. Notably, because of the frail nature of old aged people, they cannot effectively work in the agricultural sector which is the primary and reliable source of income for rural households and this places them at a competitive economic disadvantage. Because of low efficiency which results in low productivity, aged communities often have very low incomes which translate to rampant poverty, hunger and malnutrition. This research revealed that most households headed by old aged people mostly those above 48 years, had serious challenges in maintaining sustainable livelihoods. Precisely, they could not purchase or subscribe for essential social and economic services such as modern energy services, schooling for their children, accessing adequate medical services and affording a decent meal for their households.

4.3. Educational Qualifications

According to the UNDP (2001) education is the most valuable asset needed by rural people of developing countries if they are to set themselves free from the bondages of poverty and deprivation. Notably, with education, rural societies can be empowered and be able to start their own businesses, secure employment in other non-farm sectors and thus become able to afford essential services. In this research, participants were asked to state their highest educational qualification. The research made use of five educational qualifications which included primary certificate, secondary certificate; tertiary/university degree, technical college diploma and none (never attained formal education). Each participant was asked to choose an educational qualification which best captured their highest educational qualification. Figure 11 below presents the descriptive data as it relates to the educational qualifications of the participants in this study.

Figure 11: Educational Qualifications in Dewedzo



The research found out that the highest number (66%) of participants had primary school leaving certificates as their highest educational qualification. Furthermore, 22% of the sampled population mentioned secondary education certificate as the highest educational qualification while no one had a tertiary/university qualification. In addition, 4% of the participants indicated that their highest academic qualification was a technical college diploma. Lastly, 8% of the participants indicated that they have never attained any formal education qualification.

The high percentage of people with primary education as their highest academic achievement can possibly be explained in the context of the Zimbabwean government policy as it relates to primary education. The Zimbabwean government in line and pursuant to the ideals of the millennium development goals has declared that it is a basic right for every child to have access to basic primary education which comprises of the seven year primary school course. Most rural people are able to access primary school up to grade seven which is the last class for primary education through the assistance of various nongovernmental organizations and other public funding schemes such as the Basic Education Assistance Module (BEAM) meant for poor people. Primary education is heavily subsidized by the government to allow all people to afford basic education. However after completing the primary course, there is very little support from both the private and public sectors hence many children fail to proceed to secondary schools. Generally secondary education is expensive in Zimbabwe resulting in the cost act as a barrier for most poor people. Notably, the cost of acquiring education in Zimbabwe increases with each level and this prevents most people especially from low income households from improving their education. In this light,

FAO (2011) perceives that there is often a very wide gap between secondary school graduates and those who finally make it into tertiary colleges in Zimbabwe. Lastly all of the uneducated people who constituted 8% of the total sample were old aged people who could not attain education due to past colonial policies and the subsequent liberation war which disturbed school processes.

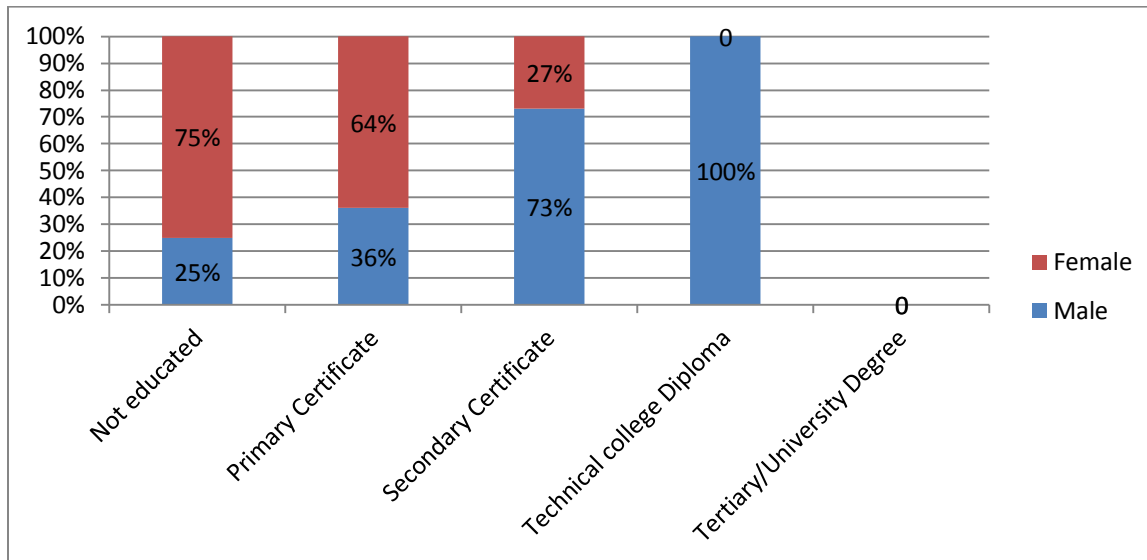
With the greater population of Dewedzo being predominantly uneducated or unskilled, most people rely on the natural environment for their survival as they cannot successfully secure employment in other nonfarm sectors of the economy. According to one participant, “people have to do with what is available to them”. Implicitly, the lack of employable skills amongst the sampled population of Dewedzo forces people to depend on unsustainable activities for survival. The most pronounced economic activities of the sampled population are activities which do not require education or skilled labor and these include cutting and selling firewood, and working as farm laborers.

Without education, it is very difficult to improve production in Dewedzo. Continued reliance on out dated agricultural methods and practices will not in any way protect the people from the recurring food deficiencies and the generally wide spread hunger. With education, it is possible to improve agricultural production which in turn will lead to an adequate supply of food for the households. More so, improving the production aspect through educating people on modern ways of producing can potentially improve family incomes and be the first step towards poverty eradication.

4.4. Gender and Education

Another notable finding of this research is that most male participants had higher academic credentials as compared to their female counterparts. Notably, most females had low ranked academic qualifications and none had a college diploma or better qualification. Precisely, 75% of the non-educated participants were females while 25% were males. Outstandingly, 64% of primary education certificate holders were females and 36% were males. On the other hand, males dominated the secondary education category where 73% of secondary school certificate holders were males and only 27% were females. The only technical college diploma holder was a man. The distribution of educational qualification in this study suggests intolerant and gender biased social attitudes which discriminate against women. Figure 12 below shows the distribution of academic qualifications between males and females in the research.

Figure 12: Distribution of Educational Between Males and Females



Toro (2013) argues that the solution to poverty in rural communities lies with empowering women who are the main actors in rural economies. Without improving the educational capacity of rural women it is difficult to ensure food security, improve the welfare of rural households and ultimately reaching desirable levels of development. It is crucial that more women in Dewedzo attain education so that they can be able to run their farm economies. Armed with education, women can develop a sense of personal dignity and worth as well as entitlement and that will increase the pace and tone of women empowerment. Without education, women and girls cannot effectively make decisions to improve themselves.

4.3. Energy and Development

4.3.1. Energy Services in Dewedzo

The type and amount of energy used by a particular society corresponds with the quality of life in that society (Gaye 2007). Participants in this research were asked to state the type of energy they were using in their homes. The research found out that 64% of the sampled households used wood fuel as their principal source of energy while 36% relied on electricity for their day to day energy needs. Wood fuel and electricity are the major sources of energy in the sampled households. Other sources of energy which were reported in this study include solar energy and cow dung which were used by 18% and 8% respectively. Solar and cow dung were used as substitutes rather than as principal sources of energy. Solar energy is mainly used for domestic lighting and to power electronic gadgets such as radios and televisions as well as charging cell phones. Cow dung was reportedly used only as an emergency source of energy when

the household would have run out of their principal energy services. The following table 1 shows the distribution of different energy type users amongst the sampled households.

Table 1: Energy Sources for the Sampled Households

Type of Principal Energy source	Number of Users	Percentage
Electricity	18	36%
Wood	32	64%
Solar	09 (Only used as a secondary source)	18%
Cow dung	04 (Only used as a secondary source)	8%

This study confirmed the assertion by AFREA (2012), which states that the majority of rural households in developing countries do not have access to electricity or any other sustainable source of energy; they depend on traditional energy sources. This study found out that the majority of the sampled households predominantly used wood as their source of energy. It also emerged that the reliance on traditional energy services by the majority of the sampled households was not optional; but is a result of energy poverty which in the main implies the unavailability of other cleaner and sustainable energy services.

Access to modern energy resources amongst the sampled household was limited due the exorbitant cost of installing alternative sources of energy such as electricity. Some sampled households indicated that even if they are to install electricity in their homes, they do not have money to buy electric gadgets which they can use to convert electric

energy to useful services such as lighting, heating and cooking. More so, the research revealed that with their meagre and often erratic incomes, most households in Dewedzo cannot sustain the monthly cost of using electricity which on average ranges between US\$20 and \$30 per month. Another huddle to rural electrification is the unavailability of a national energy gridline in most parts of Dewedzo which makes it impossible for some households to access modern energy services.

4.3.2. The Cost of Energy Services

Zimbabwe has always been noted as one of the countries in Africa which offers cheap energy services. Gwamuri and Mhlanga (2012) avers that between 2000 and 2008, Zimbabwe’s energy sector was severely affected by unsustainable energy pricing which was way below regional prices and this led to high debts to external energy suppliers. However, although electricity is generally cheap in Zimbabwe, high unemployment rates which translates to very low incomes always make it difficult for the people to afford using it. In this study, the participants were asked to estimate the cost of energy they incur on a monthly basis. Six cost ranges were given and each person had to choose a cost range which best describes their expenditure on energy.

Table 2: Approximated Monthly Cost of Energy Services for Sampled Households

Cost/range	US\$1 - \$20	US\$20 - \$40	US\$40 - \$60	US\$60 - \$80	US\$80 - \$100	Don't know
Number of people	7	5	0	0	0	38

Table 2 above reveals the estimations of the cost of energy for the sampled households in Dewedzo. Precisely, 7 people estimated the cost of their energy to be between US\$1 to \$ 20, while 5 people estimated that they spend between US\$20 to \$40 per month on their energy requirements. The majority of the participants (38) indicated that they don't know the cost of their energy requirements over a period of a month. It is difficult to fully quantify the value or cost of energy consumed by a household for any given period. In some instances households do not incur financial costs rather their costs can better be described in terms of opportunity cost of what they loose in the process of gathering and using they type of energy they are currently using. More so, most households use a mixture of energy types some of which their value cannot be monetarily quantified because people often get them free within their environment.

4.3.3. The opportunity cost of Energy poverty

Opportunity cost is generally defined as the loss of other alternatives when one alternative is chosen. Rural household are often trapped into poverty by the energy options available to them. Lack of access to electricity amongst the sampled households presents several social and economic disadvantages which cannot be monetarily calculated. Precisely, energy poor households in the study reported that they have to leave their income generating activities to go and gather energy resources. They noted that they are now walking increasingly longer distances to gather energy resources because it is now difficult to find fire wood in their local vicinities. Apparently, households walk an average of 3 km to get firewood. Also notable is that it is largely women and girls who are culturally charged with the responsibility of gathering and preparing energy resources for the household. Implicitly, this means that women and

girls are the ones who lose considerable hours of their time in gathering energy resources for the household instead of engaging in activities to improve their lives. In households where mothers are too old to go and gather energy resources, girl children reportedly have to rush home after school to go and gather wood fuel for the day and this seriously prejudices them of their time for study and play.

If the goal of ensuring gender equality and empowering women is to be achieved in Dewedzo, it is crucial that a reliable source of energy is made available to poor households. The time used by the girls and women in gathering wood fuel can be used effectively in reading, doing homework or in any other income generating activity for self-development. Reportedly, after the long and tiresome journey in which women and girls will be carrying bundles of fire wood on their heads, they will also have to cook in the kitchens where they are exposed to prolonged periods of indoor pollution. This is no wonder why FAO (2011) found that it is mostly women and children who are affected by indoor pollution more than any other population group. After spending prolonged hours cooking in smoky and poorly ventilated kitchens, one's eyes become sore and cannot read thus prejudicing women and girls from developing themselves. The following expression by one woman captures the negativity and undesirability of wood as a source of energy.

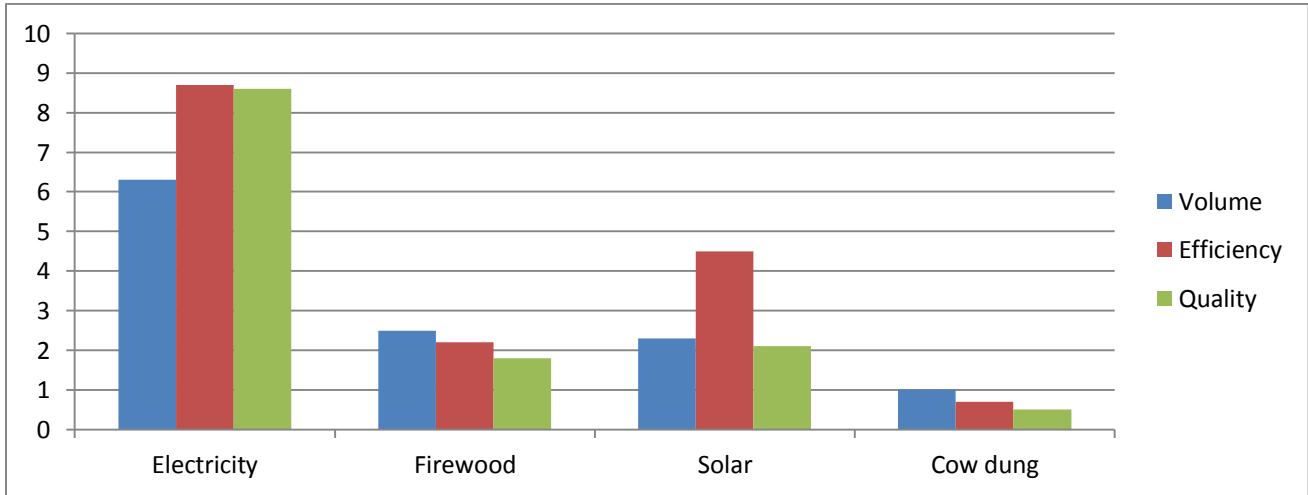
...If we use wet and other types of wood for cooking, our eyes become sore and it take a day or two to heal...

4.3.4. Energy and Productivity

Modern day, productivity is increasingly becoming dependent on the use of technology and modern energy services. In this study, the participants were asked to describe how

the types of energy they are using affect what they produce, how they produce, volumes which they produce and lastly the quality of their products. Notably, all the people in the study revealed that the type of energy they use affect their productivity in different ways. The following bar graph (figure 13) presents the perceptions of the participants on the impact of different energy services on productivity.

Figure 13: Perceptions of Sampled Households on the Impacts of Different Energy Services on Productivity



4.3.4.1. Electricity and Productivity

Figure 13 above present three dimensions of production as might be influenced by different energy types. The people were asked to describe how the type of energy they were using affected the volumes they can produce, the easiness of producing and lastly the quality of the product. Users of electricity indicated that despite frustrations arising from power cuts, electricity is by far the most efficient source of energy which supports dynamic production. Interestingly, even non users of electricity staunchly supported electricity as their desired source of energy. The research found out that people perceived that using electricity improves the easiness of production thus increasing the

quantity of produce as well as its quality. The most appraised areas where electricity has been identified as increasing productivity was in the craft industry which specializes in welding, auto repairs and manufacturing of farm tools such as hoes, ox drawn carts and other implements. Electricity was argued to boost productivity in the agricultural sector through enabling irrigation farming. Reference was given to the nearby small scale farms in Dowa where farmers use electricity to pump water for irrigation and now they no longer depend on natural rain seasons to plant.

4.3.4.2. Wood Fuel and Productivity

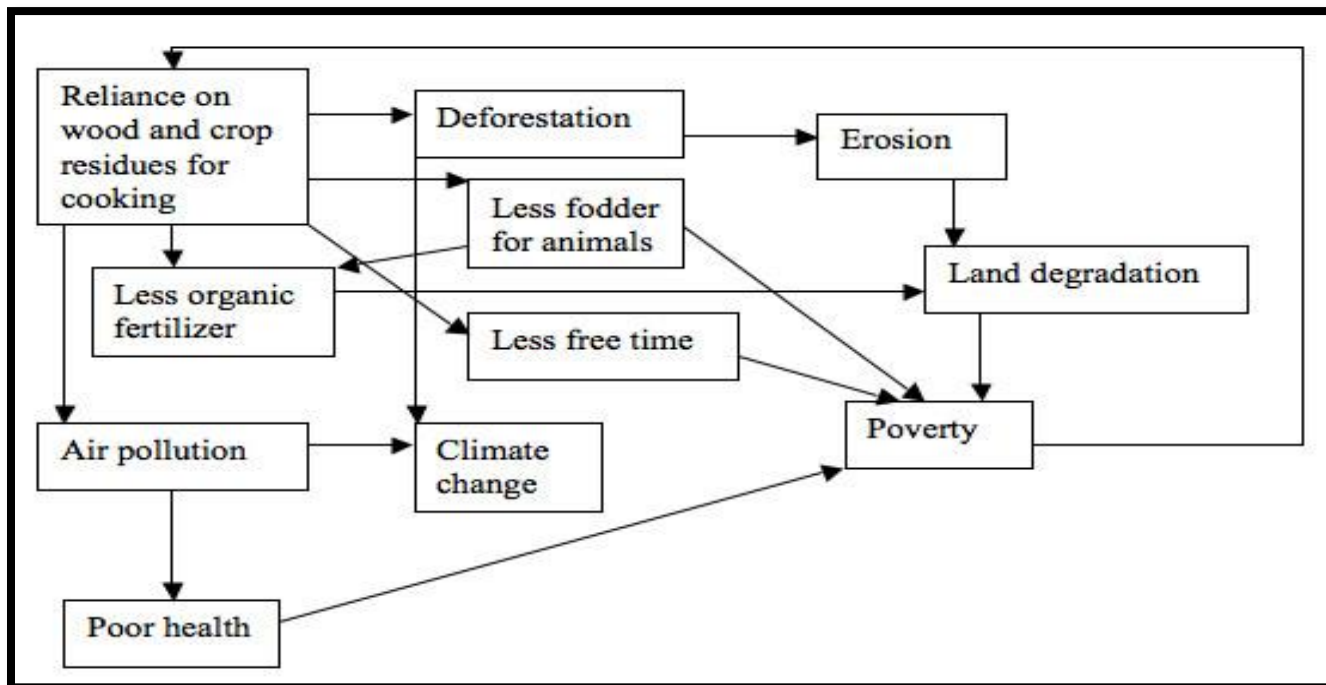
Regarding firewood as a source of energy in the production system, most people indicated that firewood reduces their potential by more than half. Participants argued that firewood is always difficult to use and its costly and in worse circumstances unavailable in the required quantities. Generally, firewood in Dewedzo is used for cooking, forging, heating in the home, lighting and for curing tobacco and bricks. Most people indicated that firewood is generally useful as a domestic source of energy. Farmers who use it for curing tobacco mentioned that they often lose considerable income in the process of curing their tobacco, one farmer said;

Last season I lost a significant portion of my tobacco in the barn after the barn caught fire, you know curing tobacco with firewood is difficult; you cannot control the heat.....

The farmer's sentiments were largely expressed by many other participants, some even mentioned that if they fail to maintain heat at certain levels, it compromises the quality of their tobacco hence it fetches lower prices at the market. The interviewed people posed

that it is now difficult for them to rely on firewood as a source of energy because the Environmental Management Agency (EMA) is increasing its presents in their area. The Environmental Management Agency protects the environment by introducing and enforcing environmental policies such as the anti-deforestation campaigns. In this respect, wood fuel has been largely described as offsetting developmental initiatives by the people of Dewedzo. The following diagram (figure 14) summarizes the impacts of wood fuel on sustainable development.

Figure 14: Impacts of Reliance on Wood Fuel and Biomass on Sustainable Development



Source: Gregory (2010)

4.3.4.3. Solar Energy and Productivity

There is increasing perception that solar energy can be the solution to the challenge of energy poverty which has continued to ravage developmental initiatives in most

developing countries. In this study, participants were asked to relate their experiences of using solar energy and its impact on their productivity. The sampled households expressed that although solar is cost and environmentally sustainable; they have not been able to effectively use it in their production. In the study it emerged that solar is generally used for domestic purposes such as domestic lighting, powering radios, televisions and charging cell phones. The study revealed that due to very low incomes, households in Dewedzo could not afford to buy solar systems with a capacity which can facilitate commercial production. However, according to the Rural Electrification Agency (2013), Manicaland Province has vast potential of generating solar energy due to prolonged overhead sun experienced in the province. It is possible that most households which are unconnected to the national energy grid can benefit if solar energy is harnessed effectively with proper solar panels and gadgets. In this light, ZMEPD (2012) published that tenders have been awarded to various companies to develop mini-hydro stations and solar systems in Manicaland and other provinces to improve on energy supply.

4.3.4.4. Cow dung and Productivity

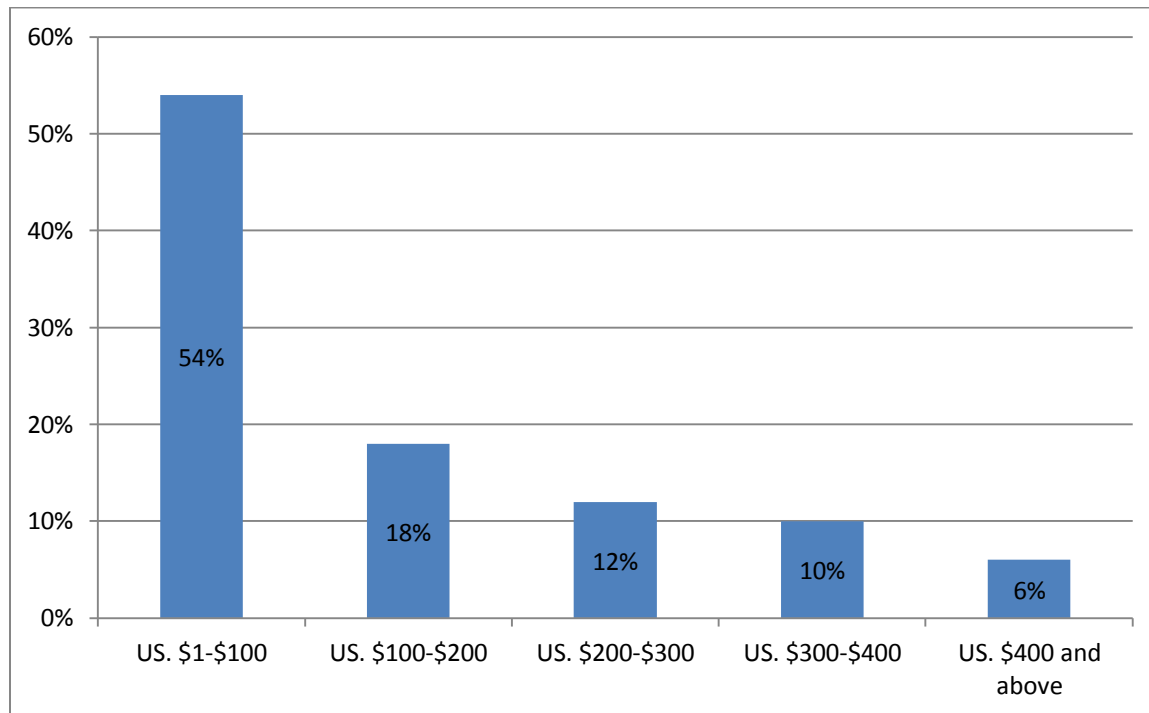
Animal wastes and agricultural residue are some of the used sources of energy by low income households with no access to sustainable energy services (Moyo et al 1999). In this research, participants who use animal wastes as sources of energy were asked to discuss their experiences with this source of energy with emphasis on its implications on productivity. Cow dung was described as a horrible source of energy. It emerged that cow dung has the least efficiency of all sources of energy used in Dewedzo. One participant indicated that apart from being dirty, cow dung causes sneezing and if used

for cooking it compromises the quality of the food because of its smell. Generally, cow dung is reportedly used for curing bricks in kilns and for cooking in some instances. In respect of the users of cow dung as a source of energy, the research revealed that it is mostly very old people and the physically infirm who use cow dung as a source of energy. Precisely all the four people who indicated that they use cow dung are all above 48 years in age. This finding was attributed to the fact that old people and the infirm have no strength to walk long distances to gather fire wood thus they resort to picking animal droppings in the grazing areas.

4.3.2. Income and Energy in Development

Participants in this study were asked to choose an income range which best describes their monthly income. Five ranges were given and participants had to choose one which best described their monthly income. The majority of the participants (54%) indicated that their income fits within the \$1 to \$100 while 18% indicated that they get between \$100 and \$200 per month. More so, 12% indicated that they were getting \$200 to \$300 while 10% indicated that getting between \$300 to 400 per month. Lastly, 6% of the participants mentioned that they were earning above \$400 per month. Below is a graph (figure 15) showing the distribution of income for the sampled households in Dewedzo.

Figure 15: Monthly Income Distribution in Dewedzo



The graph shows that the majority of the sampled households were earning less than \$100 per month. The low household income depicts that poverty is rampant in Dewedzo. According to the Share (2013), a family of five people in Zimbabwe require US\$531 per month to effectively manage their basic necessities. Implicitly, the majority of the sampled households were living on less than one fifth (1/5) of the stipulated national poverty datum line income.

With the increasing cost of living in Zimbabwe and the worsening economic conditions it is eminent that the majority of households in Dewedzo cannot successfully maintain dignified livelihoods. It is virtually impossible for the households to diversify their production neither can they afford to invest in activities which can improve their livelihoods.

4.3.2.1. Low Income Households and Energy Usage

The research noted that the majority of the sampled households fall into the low income band. With low incomes, mostly below \$200 per month, households cannot successfully manage their budgets and this often means that the households have to forego some of their necessities. Notably, the cost of energy services in Zimbabwe is well above the affordability of most low income rural households. Implicitly, lack of access to modern energy services creates a vicious circle of poverty as the cost of traditional energy services which are often thought to be cheap and readily available is always double the cost of using alternatives like electricity. The following extract (table 3) from the Zimbabwe Electricity Transmission and Distribution Commission (ZETDC, 2012) reveal a typical energy cost schedule for different energy sources for a low income household in Zimbabwe.

Table 3: Household Expenditure on Various Energy Services in a Low Income Household

Household energy need	Monthly energy source	Monthly cost US\$ (September 2012)
Cooking (two meals a day)	Electric stove (250kWh)	23.00
	Gas stove (6 kg LPG)	18.00
	Kerosene (30L)	34.50
	Gel stove (20kg)	39.50
	Firewood (60 bundles)	60.00
Lighting (3 rooms, 4 hours a day)	Energy savers (4kWh)	0.08
	Incandescent (20kWh)	0.40
	Candles (40 or 400g)	16.80
Entertainment (radio 8 hours a day)	Electric (12 kWh)	0.24
	Radio (4 torch cells)	19.40

Source : ZETDC (2012) Cited in African

Low income households which use traditional energy services often spend a substantial amount of their meagre incomes on acquiring energy services (Ogunlade and Youba 2002). Typically, and in line with the above noted energy cost schedule (table 3) for different energy services, it is apparent that low income earners spend more than 30% of their monthly incomes on securing energy services. Moreover, while different energy sources require different budgets per month, traditional energy users require increasingly significantly higher budgets for their energy needs. The research found out that 93% of low income households had no access to a sustainable source of energy such as electricity or solar. This puts more strain on these poor households as they have to make ends meet.

This study found out that lack of access to modern energy services has an exponential effect on the quantity of energy used. Due to lack of access to modern energy services which can enable people to use radios and televisions for entertainment purposes, poor people spend longer periods sitting around fires thus they consume more energy resources as compared to higher income households which can save energy through less energy requiring services such as listening to a radio. Moreover, prolonged periods spend by poor people around fires expose them to prolonged indoor pollution which increases the risk of pulmonary diseases.

The research found out that most low income households could not afford to buy efficient energy converting gadgets and this often resulted in substantial amounts of energy being wasted on a task which could have been done with much less energy. At least 30% of electricity using households reportedly used electric stoves which had electric faults. The stoves were slowly heating up resulting in a prolonged cooking

process and subsequently, substantial amounts energy is lost in the process thus increasing the cost of energy. Amongst the sampled low income households, energy was largely used for domestic purposes such as cooking, lighting and heating in the homes.

4.3.2.2. Medium Income Households and Energy Usage

Medium income earners amongst the sampled households were earning between \$200 and \$400 per month. Although this group's income was relatively higher, the households in this category still had challenges in supporting their families' welfare. The majority of middle income households (79%) were reliant on wood fuel for their energy requirements and 21% used electricity. However, unlike in low income households which were fully reliant on wood fuel as a source of energy, 76% of the medium income earners used solar as substitute source of energy. Solar energy enabled them to have relatively improved access to information and communication as compared to those who fully rely on wood and cow dung as sources of energy. The research revealed that at least 18% of the income of middle income households is used in securing energy services as compared to the 30% used by low income households for the same. Notably, increase in household income had an inverse relationship with the monthly cost of energy services. The main purposes for which energy was required amongst the sampled middle income households included communication, entertainment and domestic purposes such as lighting, heating and cooking.

4.3.2.3. High Income Households and Energy Usage

The study revealed that the relatively high income earning households in Dewedzo earns between \$400 and \$500 per month. Interestingly, high income earning

households had a member who is employed in the nonfarm economy. Households with higher incomes had relatively easy access to essential social and economic services. Precisely, all the 3 households whose incomes exceeded \$400 used electricity as their principal source of energy. The high income households reportedly had investments in other non-agricultural sectors of the rural economy, for example; 2 out of the 3 high income households had electric grinding mills which earned them incomes. Unlike in the low and middle income households where energy was largely required for domestic purposes, in high income households, energy was required for production, communication, entertainment and domestic purposes.

4.3.3. Income as a Determinant of the Quality and Quantity of Energy for Households

With regards to energy usage, the research found out that income was a very crucial consideration by the households in deciding on the type of energy which the household could afford. Notably, the size of a household's disposable income after securing basic necessities such as basic food stuffs and paying school fees for children determined the type and amount of energy services which the household would be able to use. Users of electricity indicated that with the newly installed prepaid billing system, they only recharge their electrical accounts when they have disposable incomes and when they don't have money to recharge they use alternative sources of energy.

4.3.4. Household Size and Energy

The magnitude of a household is often considered as a very imperious component of rural societies. Basically, rural communities have a favorable perception of large

families as these are considered as basic security against death, a source of cheap labor in the farm economy, an investment for the parent's welfare in old age and a symbol of wealth and virility (Toro 2013). Schiller (2003) argues that the size of households in a particular society determines the degree of easiness of supplying important human and economic services. In this research, participants were asked to state the sizes of their households. Notably, the research found out that out of the total sampled households, the average household consisted of 7 people. A typical family was constituted by the parent/s, children, and grandchildren. The smallest household which was recorded in this research had 5 members and the largest household had 14 members. The research found out that at least each household head was responsible for an average of 6 dependants.

Large households are having serious social and economic ramifications on human social and economic development. FAO (2011) notes that most communal areas in Zimbabwe are often overpopulated hence there are often critical shortages of crucial resources. The research unraveled that very large households had challenges in providing adequate nutrition for the children and this often resulted in severe hunger and malnutrition. Moreover, large households required more energy resources than small families and this often force the people to rely on cheap but environmentally destabilizing fuels. With very large families, it is difficult to logically pursue rural transformation.

4.3.5. Energy Poverty and Access to Food

One of the manifestations of poverty in Africa is extreme hunger and starvation. FAO (2011) estimates that 33% of African people experience starvation, hunger and

malnutrition. In Zimbabwe, the recent agrarian reforms conducted by the government critically destabilized food security in the country and triggered severe shocks in all agro based industries resulting in shortages of basic food commodities. In this study, participants were asked to describe their normal eating habits including the composition of their daily meals. These were deemed important in determining the extent of hunger and malnutrition as might be influenced by the type of energy used by each household. The participants were asked to state the number of meals that they often have in a day. The following table 4 presents the responses given in respect of the number of meals eaten per day by participants.

Table 4: Eating Frequencies per Day

Number of Meals Per Day	Frequency	Percentage
1	14	28%
2	28	56%
3	6	12%
Other	2	4%

The participants indicated that the number of meals which they can afford per day is determined by the level of food security in the household. Notably, participants indicated that usually, when their household food reserves can last them for over a month, they can afford to have two meals a day, however, if they are below a month, they resort to one meal a day. Apart from scarcity of food, the participants indicated that they often resort to limited meals per day because of the difficulty associated with cooking due to scarcity of energy services. Precisely, 56% of the participants indicated that they cannot

stand the heat to cook in the afternoon hence they often have one meal in the morning and another meal at night. Conversely 12% and 4% respectively indicated that since they use electricity, it's easier for them to cook hence they can afford to have 3 meals or above per day.

FAO (2011) purports that it is not the number of meals per day which is paramount in ensuring a health and sustainable life style for poor people. It argued that usually the quality rather than the quantity of food is important. In this study, all the participants indicated that their main meal is often constituted of pap (sadza) and green vegetables and occasionally they have meat. The following table 5 shows the frequencies of having meat in a meal by the participants on a daily, weekly and monthly basis.

Table 5: Dynamics of having meat in a meal among wood fuel users and Electricity users

Type of Energy User	Frequency of having meat in a meal per day	Frequency of having meat in a meal per week	Frequency of having meat in a meal per month
Electricity Users	4/18	12/18	16/18
Wood Fuel Users	1/32	3/32	21/32

The research noted that access to meat which adds protein in a meal was relatively higher amongst households who had access to electricity as compared to those who used wood fuel as a source of energy. Participants who had no access to electricity were 4 times not likely to have meat in their meals as compared to their counterparts who had access to electricity. The general explanation for the disparity could be that households which had access to electricity can possibly use refrigerators to store their

meat reserves for a longer period thus afford to have meat more frequently. On the other hand, those who do not have access to electricity would need to rely on buying from the butchery on a daily basis. In this regard, energy poor households often fail to get access to meat and other food items which need to be refrigerated. Their challenge is further compounded by the fact that most butchery owners in Dewedzo are now skeptical of storing large amounts of meat because of the erratic energy supplies caused by the excessive load shedding. Implicitly, poor access to electricity is a contributing factor to malnutrition and hunger. In some instances, even though rural people might be having the money to buy their necessities; they are often faced with shops which cannot sell their needed commodities because of their perishable nature which require refrigeration.

4.4. Women and Energy Poverty

Lazaridis and Nasir (2010) posit that women are the worst victims of energy poverty in most developing countries. African traditional culture charges women with the responsibility to gather and prepare energy resources for the family (Moyo et al 1999). In this research, the participants were asked some questions which would help to elicit the gender impacts of energy poverty in Dewedzo. The participants were asked to describe who was responsible for gathering energy resources in their homes. Notably, 62% of the respondents indicated that it is the duty of women and children to gather energy resources in their homes. In addition, another 8% of the respondents mentioned that gathering energy resources in their homes was the duty of domestic workers and 8% indicated that they buy from others in the community. Lastly, 22% of the respondents used electricity which does not need to be gathered physically.

The research found out that collection and processing of traditional energy resources prejudice women of enough time to engage in self developing activities. In retrospect, women who had access to electricity for example indicated that they spend most of their leisure time with their families and they also go to sawing clubs which also brings them income. Additionally, other women who had access to electricity indicated that they engage in small scale businesses such as hair dressing. On the other hand, women who had no access to modern energy services indicated that it is very difficult for them to find quality time with their families because of their often busy schedules. However, they argued that they often use the time when they will be gathering firewood in the forests to teach their girl children essential feminine issues which they may encounter in their adult lives.

More so, women poverty of energy is very hard on girl children who have to accompany their mothers to the forests to gather energy resources. One participant indicated that she pity her daughter who has to spend a substantial amount of her weekends in the forests gathering fire wood instead of studying. She further highlighted that going to fetch fire wood at times coincides with the time her daughter would be intending to read or do her school work. In this light, it is evident that women and girls are the hardest hit victims of energy poverty. Without changing the energy alternatives for the energy poor, there is very little hope that rural women in Dewedzo will break the tradition of being uneducated, unskilled and dependent on males for their economic survival.

In Dewedzo, not only are women and girl children responsible for gathering domestic energy resources in their homes. It is also their duty to cook and this expose them to prolonged periods of exposure to toxic gases from the fossil fuels they will be using.

Internationally, women and children have been noted as the largest population groups whose health is directly affected by poor energy services. Mishra (2003) sustain that generally, 67% of all ARI victims are females. This suggests that other than the economic challenges brought about by the use of unsustainable energy services, women face the risk of poor health due to the type of energy they use.

4.5. Energy and Human Development

The human development theory insinuates that the ultimate goal of development is to infuse skills into the people so that they may live lives which they value most. The UNDP (2001) mentions that in the modern world, central to human survival is the development of employable skills with which one can earn a living. More so, the sustainable livelihoods approach emphasises that, sustainable livelihoods are dependent on the capabilities of the individual to engage in economically rewarding activities from which the individual can earn a living. In this regard, formal education in schools, colleges, technical colleges and other craft work are viewed as instruments which can drive societies out of poverty. The role of sustainable energy in facilitating human capacity development cannot be over emphasised. In this research, participants were asked to reflect on how the type of energy they were using affected their personal development.

The UNPD (2001) poses that people all over the world have high hopes that new technologies will lead to healthier lives, greater social freedoms, increased knowledge and more productive livelihoods. In this study, the participants were asked to reflect on how their access or lack of access to modern energy services impacted on their

personal and communal capacity for development. The following were the major outcomes of how energy poverty in Dewedzo impact on people's capacity for development.

4.5.1. Information

Lack of modern energy services in Dewedzo is arguably impeding people's access to information and communication. Rural households which do not have easy access to electricity or solar energy indicated that they are still to effectively benefit from the use of mobile telephones since they often do not have a mean to recharge the gadget once it runs out of power. Notably, some participants indicated that they have to travel for more than 3km so as to charge their mobile phones. More so, 60% of participants from energy poor households indicated that they have mobile phones but they only use them when it is necessary to do so. This is a measure of saving the batteries of the cell phones. More so, another 30% of participants from energy poor households indicated that they don't have cell phones as they don't see their value since they don't have any means of recharging them. In addition, 10% of participants without access to electricity used mobile cell phones and they charged them with solar energy. Contrastingly, 88% of the people who had access to electricity used mobile phones on a daily basis while 8% indicated that they didn't have cell phones because they cannot afford to buy one. Lastly 4% indicated that they were too old to operate a phone hence they depend on others for their communication.

Furthermore, 12% of the energy poor households had access to television sets and 52% had radios which were powered using car batteries and solar energy. Inversely,

86% of households which had access to electricity owned television sets and 100% had radios.

Poor access to a reliable means of communication amongst energy poor households had far reaching implications on the developmental capacities of the sampled households. They intimated that due to their inability to use cell phones, they cannot seek advice from others on pertinent issues of their lives. More so, the participants indicated that lack of access to a reliable means of communication put their lives at stake in situations where they get sick and they cannot seek external help especially during nights. This challenge is further compacted by the fact that households are sparsely distributed and in some instances one has to travel for more than a kilometer to get to the nearest neighbor. Moreover, due to lack of access to energy to charge mobile cell phones, energy poor households reportedly missed on vital agricultural advices provided through the ECOFARMER programme offered by one of the network service providers in Zimbabwe. The low percentage of people with radio and television systems in their homes implies that these people are disenfranchised from accessing important information regarding national politics, social and economic issues. Implicitly, energy poor people are always misses out on important and necessary information crucial in assisting them to make well informed decision for important issues such as elections or referendums. In this regard, lack of access to modern energy services, infringes on people's right to informed participation. Lack of constant access to radios and televisions as means of communication implies that energy poor people has no access to vital agricultural information such as weather focus, and news regarding new

methods of farming and seeds. This reduces people's productivity and their capacity for development.

4.5.2. Education

Ogunlade and Youba (2002) perceive that modern energy services have a central role to play in the education sector of developing countries. Notably, most rural schools of developing countries have failed to embrace technology to enhance the learning experiences of the learners due to lack of an enabling energy regime. In this study, participants were asked to explain how access to modern energy or lack of it affects the educational prospects of their household members.

The research revealed that lack of access to modern energy services was largely blamed by people as a leading cause for poor educational standards amongst energy poor households. The participants indicated that due to lack of access to modern energy services, children are not able to read during the night because of poor lighting. Notably, energy poor households used paraffin lamps or candles for lighting at night. The paraffin lamps are reportedly very difficult to use for reading as the light is constantly flickering, on the other hand, candles are expensive. In this light, the participants argued that poverty of energy reduces the chances of having children passing at school because of poor studying conditions. The children have to study during the day using day light, however, there is the challenge that during the day they also have to assist in other household chores. In addition, participants from electricity using households indicated that the continued and severe load shedding effected by the ZESA disrupts their children's reading time tables.

4.6. Government Intervention in the Fight against Energy Poverty

It is pertinent that governments of African countries invest in the production and security of energy supply to ensure growth and development of their economies. AGECC (2010) argues that the provision of sustainable energy services to areas where it is currently not accessible should be conceived as a human right rather than a mere administrative function of the government. The government should make visible efforts of extending the national energy grid to cover rural areas so as to address the challenges of energy poverty. In this research, inquiry into the available programmes and policies geared towards eradicating rural energy poverty was made.

Notably, the research found out that the major programme or project by the government meant to ease and alleviate rural energy poverty is the Rural Electrification Programme (REP). Through the Rural Electrification Agency, the government provided electricity to major growth points such as St. Bedes service centre and Dowa. The REP has also facilitated the provision of electricity to St. Bedes rural hospital, public schools such as Tswatswa primary school, Dewedzo High school and other government offices including government owned houses where public workers resides.

The participants were asked whether the REP has been effective in its mandate of ensuring increased accessibility of electricity by rural people. Notably, 98% of the interviewed people revealed that they were not aware of the objectives of the programme. They argued that the programme was largely benefiting rich people and government employees. Notably, the cost of installing electricity in a private home is very high. This explains why mostly public institutions are connected while private households continue to stay in darkness. The participants also complained that the

REP has been unfairly implemented; they argued that areas closer to the homes of politically connected people get better preference as compared to others. Precisely, the politicization of the REP has caused serious delays in the beneficiation of some private and public enterprises.

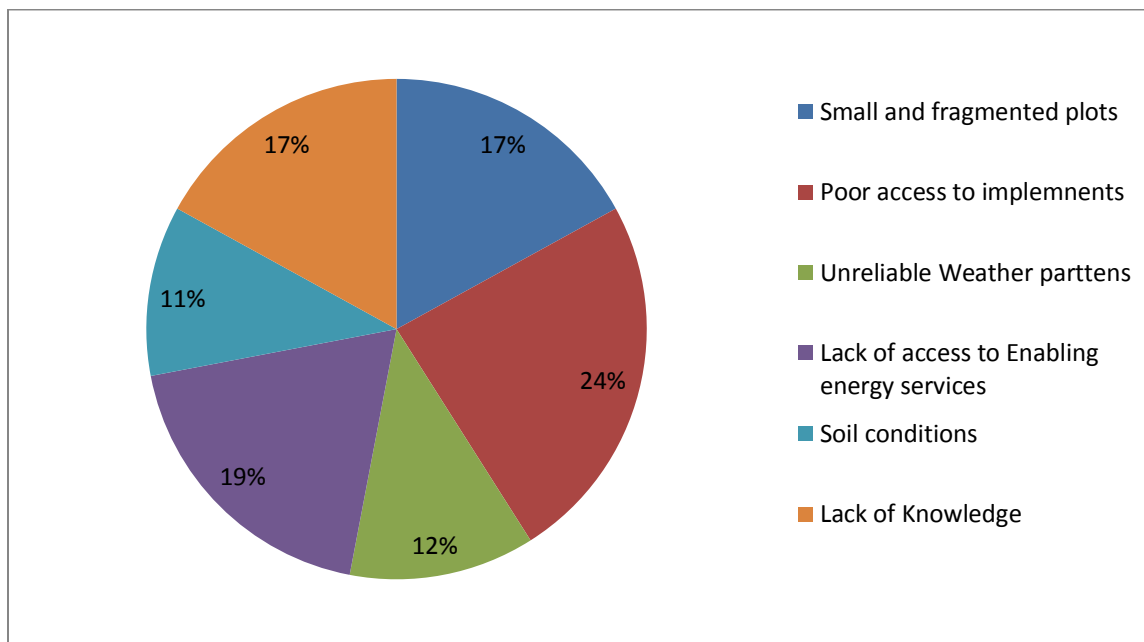
Another significant government initiative to ease and improve people's accessibility to electricity is the recent slashing of electricity bills. The Share (2013) report that the Zimbabwean government ordered ZESA to write off debts which accrued on all domestic users of electricity in the country. Through the government's debt relief initiative, the power utility company ZESA wrote off more than US\$80 million which had accrued as debt on their customer accounts. Although there are contestations regarding the real essence of the initiative, with others calling it a political strategy, the initiative reportedly helped rural people whose electricity bills had accumulated huge debts. However, economists and social commentators have highlighted fears that interference by the government in the pricing of electricity might be detrimental to the sustainable supply of electricity.

4.7. Agricultural Transformation and Rural Development

The transformation of rural communities of developing countries largely depends on improvement of the agricultural sector FAO (2011). Agricultural transformation can be the panacea to the protracted low productivity in rural communities of Africa (Gaye 2007). Participants in this research were asked about how their agricultural production was affected by poor access to electricity.

Dewedzo being a predominantly farming community, all the participants practiced agriculture although at varying levels of specialization. Generally, agriculture amongst the participants was subsistence. According to Cousins and Scoones (2009) subsistence agriculture is when a farmer produces mainly for personal subsistence and selling the surplus so as to meet basic needs of his/her household. The farmers were asked why they have not attempted to improve their production to a commercial level which would improve their incomes. The following chart (figure 16) shows the reasons expressed by the interviewees as to why they are failing to improve their production to a commercial level.

Figure 16: Reasons for not Commercialising Agriculture in Dewedzo



Chief amongst the reasons sited as stifling peasant agriculture in Dewedzo as perceived by the 17% of the participants is that their farms are too small and defragmented to allow them to reach a commercial scale of production. More so, 24% regarded their limited access to proper implements including fertilizers and seeds as a

challenge bringing down their production while 12% mentioned that unreliable weather patterns played a bigger role in discouraging their productivity from reaching commercial levels. In addition, 19% and 11% participants perceived that lack of enabling energy services and poor soil condition were their biggest challenges respectively. Lastly 17% indicated that they lacked adequate agricultural knowledge which can take their productivity to another level.

Interestingly, all the reasons cited as hurting rural agriculture in Dewedzo share a common denominator which is lack of access to modern energy services. The farmers' perception farm size is a prerequisite for commercial production attest to the lack of information and utilization of outdated farming methods which produces less yields per unit area. More so, the challenge of unreliable weather conditions can best be explained by the seasonality of production in the area. If electricity is made available to the farmers, they can be able avoid the challenge of fickle weather by engaging in irrigation farming which is less dependent on natural weather conditions.

4.8. Energy and Health

Apart from the widely acknowledged environmental concerns such as deforestation and greenhouse emissions, excessive reliance on solid biomass is associated with a number of negative health outcomes (Venema and Cisse 2004). Heavy reliance on traditional and non-renewable sources of energy has been widely condemned as a serious cause of indoor pollution. Mishra (2003) mentions that in Zimbabwe, 16% of the children who lived in households which use traditional energy sources suffer from Acute Respiratory Illness (ARI). In this study, the respondents were asked questions

pertaining to their health as might be influenced by the type of energy they used in their homes.

This research found a significant trend of health complications amongst the sampled households. Precisely, 28% (translating to 9 people) of the respondents who use firewood as their principal source of energy indicated that they have either themselves or a member of their household diagnosed of a respiratory infection. On a similar note, 25% (translating to 1 person) using cow dung as a source of energy indicated that she has been diagnosed with tuberculosis. Inversely, only 11.1% and 22.2 of the users of electricity and solar respectively reported that they have a relative or themselves diagnosed of respiratory a disease.

Notably, from the statistics presented above, it is apparent that respiratory infections are high amongst users of solid fossil sources of energy as compared to users of modern and cleaner sources of energy. Suggestively, it is the fumes from the fossil fuels used by the energy poor people which accounts for their higher probability of having respiratory challenges. More so, the high incidents of respiratory infections amongst cow dung users corresponds with the assertion by Mishra (2003) who mentions that burning cow dung, increases the risk of getting pulmonary diseases in people.

4.9. Conclusion

Access to modern energy services is a pre-requisite for sustainable development and the achievement of the millennium development goals. Without increased assess to sustainable energy services, it is impossible to eradicate poverty and hunger and also to ensure equal gender development. Precisely, there is need to energize MDGs to make

them achievable in energy poor parts of Zimbabwe. Notably, Zimbabwe needs to go beyond policy formulation but act decisively against energy poverty if the priority goals of eradicating poverty and hunger and ensuring gender parity are to be realized.

This research observed that both the Zimbabwean government and the people of Dewedzo are making frantic efforts to develop themselves but their efforts are being countered by energy poverty. The gains of the favorable policy environment created towards poverty and hunger reduction and women empowerment are being overtaken by the technical hardships caused by poor access to modern energy services. It is therefore plausible to conclude that lack of access to electricity is a huddle to human social and economic development. In fact poverty of energy increases the risk of environmental change and the vulnerability of people to poverty, hunger and perpetuates the subjugation of women to patriarchal attitudes which exacerbates their social and economic disempowerment.

Energy poverty in Dewedzo has debilitating effects on many facets of communal life. Notably, without electricity or another modern alternative source of energy, rural children cannot be able to read at night to improve their education and rural farmers cannot diversify their production and change from seasonal to all year round production which can ensure higher incomes and overall food security.

While the international drafters of the MDGs had a very good vision of achieving universal development, it is apparent that they had not taken into consideration the plight of energy poor countries and their ability to attain the goals. It is pertinent that the next regime of international development goals which will replace MDGs should be

taken with full consideration of energy dynamics in the world. Apparently, achievement of technology driven development is a nightmare in energy poor communities of developing countries. It remains doubtful if not impossible for rural communities like Dewedzo to record positive achievements in the post MDG period especially in relationship to poverty and hunger eradication, gender equality and environmental sustainability if the status quo of energy poverty is not effectively addressed.

Chapter 5

Summary of findings, Conclusions and Recommendations

5.1. Introduction

The previous chapter extensively dealt with the presentation and general discussion of the research findings. This chapter ties together the entire research project by means of providing a critical summary of the major findings of the research, offering recommendations and conclusions. By way of reconciling the findings of the study with the theoretical frameworks discussed earlier in chapter 2, the chapter will make insinuations and conclusions regarding the discourse of energy poverty and the state of rural underdevelopment in Zimbabwe. Recommendations in respect of the key findings of the study are provided together with possible dimensions of future studies and these will built up to the final conclusion.

5.2. Summary of Findings and Conclusions

This research was primarily concerned about establishing the relationship between energy poverty and rural transformation with special reference to the attainment of MDG1 and 3 which are the priority goals set by the Zimbabwean government. Evidence gathered in this study coalesced into the conclusion that poverty of energy in Dewedzo is the greatest menace to the prospect of rural transformation and impedes the attainment of MDGs 1 and 3. A positive relationship exists between various indicators of underdevelopment and energy poverty.

This study revealed that energy poverty leaves the rural people in Dewedzo without an option but to rely on wood fuel for their energy requirements. The research noted that 64% of the participants were using wood fuel as their principal source of energy. Utilization of wood fuel reportedly affects users in various ways including in terms of their health, reduced incomes due to poor and low quality products and generally low productivity associated with using wood fuel.

Another important finding of this study is in line with an observed pattern of income expenditure by different energy type users on their monthly energy requirements. The research established that principal users of wood fuel spend at least 30% of their monthly incomes on securing energy services. In contrast, principal users of electricity and secondary users of solar energy use 18% and 11% of their monthly incomes respectively for their monthly energy requirements. Implicitly, using traditional energy services prejudice wood fuel using households of at least 19% of their already low incomes which can possibly be invested in other important things.

The study also found out that although in some instances like when members of the household fetch their wood fuel by themselves from the forests thus avoiding incurring direct financial costs, the opportunity cost is always devastating. Wood fuel users in Dewedzo walk for very long distances to fetch firewood and this requires several hours per day. Practical Action (2009) writes that time is an important and expensive resource. Should people of Dewedzo have access to an efficient and reliable source of energy, they can potentially invest the time they spend in gathering energy resources in doing other productive activities for their development.

The study confirmed that poor access to modern energy services by poor people limits their access to essential life enhancing services and critically undermines their productivity. Without access to electricity or another clean, efficient and reliable source of energy, rural people in Dewedzo have not industrialized and this has left the majority of the people dependent on agriculture as their main source of income. However, with the constantly diminishing agricultural incomes, it is likely that efforts to transform Dewedzo into becoming a self sustaining community will remain unachievable. Modi et al (2005) mentions that for rural transformation initiatives to be effective, it is crucial to first create other non-farm employment from which people will get incomes to develop themselves and their infrastructure.

In addition, Energy poverty in Dewedzo reduces the capacity of farmers to produce food crops to their maximum potentials. Without access to modern energy services on which agricultural transformation can be efficiently pursued, rural famers of Dewedzo have continued to depend on natural rain fed agricultural production. Should the farmers have access to electricity, they can use electric pumps to embark on irrigation farming which can earn them recurrent incomes. Moreover, with constant and predictable agricultural incomes, rural farmers in Dewedzo can buy modern hybrid seeds, fertilizers, and other implements which can improve their yields. Also with reliable incomes, the farmers can send their children to better schools to acquire knowledge and skills on ways to transform their impoverished communities.

This study also found out that lack of access to modern energy services in Dewedzo contributes to poor development of human capital. Education of children is in Dewedzo is seriously undermined by lack of access to electricity by rural schools. Were as other

schools are now moving into digital education, most schools in Dewedzo have not been able use nor include computer courses into their curricular mainly due to the unavailability of electricity needed for powering the machines. Although some schools in Dewedzo received some computers through the Zimbabwe Presidential Computers Programme, there are reports that some schools have not been able to use them because they have no power to use them with. Moreover, without attractive energy packages, rural schools are not able to attract and retain skilled and competent teachers resulting in poor learning experiences for rural children. Additionally, without access to a clean, efficient and reliable source of energy, rural children in Dewedzo can not read at night and this apparent lack of study opportunities is often reflected in their yearly academic results.

Lack of access to modern, clean and efficient energy services, in Dewedzo was also found to undermine public health. Energy poor households which relied on wood fuel and cow dung for their energy requirements experienced respiratory and pulmonary diseases such as tuberculosis and other airborne diseases due to indoor air pollution. Prolonged hours of expose to toxic fumes from burning fossil fuels cause an array of respiratory complications.

Another significant and important finding of this study is that due to poor accessibility of modern energy services, people in Dewedzo have limited access to information and this shrink their capacities and opportunities for development. Despite increasing penetration of mobile communication services through mobile cell phone services, people in Dewedzo are still to fully benefit from this penetration of mobile communication. Without electricity or an appropriate solar system, energy poor people

in Dewedzo are not able to recharge their cell phone batteries. In some instances, due to prolonged and severe load shedding exercises by ZESA, network satellites which are dependent on the availability of electricity ceases to work, resulting in the disruption of communication for the people of Dewedzo.

More so, poverty of energy in Dewedzo has a gender dimension. This research found a strong correlation between energy poverty and the feminization of poverty. Women and girl children are culturally responsible for gathering and preparing energy resources for the household. This implies that women and girls in Dewedzo endure very long walking distances of more than 3km carrying bundles of firewood on their heads. Apart from the torture associated with the weight of the fire wood, these women and girls lose considerable hours of their time in the forests gathering the wood fuel. Moreover, it is women and girls who are also responsible for cooking for their families in the often poorly ventilated kitchens. In these kitchens, women and girls are exposed to high levels of indoor pollution which put their health at risk. As if that is not enough, women and girls in Zimbabwe are often victims of sexual assault and murder which happens in forests when they will be gathering firewood (Newsday 2014). Without access to sustainable modern energy services in Dewedzo and Zimbabwe in general, it is highly unlikely that the goal of achieving gender equality and empowering women will be achieved.

Environmental sustainability is one facet of development which is increasingly becoming important in modern development trajectories. This research established that with energy poverty, rural communities cannot consider environmental sustainability as a crucial component of their development trajectory. Energy resources used in Dewedzo

has severe impacts on the ability of the natural environment. Due to poverty of energy, the people of Dewedzo prey on natural forests and this has resulted in severe deforestation of surrounding forests such as the famous Chinyenyavana hills. Deforestation have some other impacts on the natural ecosystem including increased soil erosion which results in siltation of water bodies on which the rural people and their livestock are dependent on.

Burning of wood fuel, cow dung and other biomass fuels causes environmental changes. The utilization of fossil fuels as sources of energy often results in large amounts of toxic fumes being emitted into the atmosphere resulting in adverse weather conditions such as erratic rainfall, draughts and famines including other environmental hazards. In Dewedzo, most people reported that because of recent changes in their natural climate, their agricultural yields have significantly dropped resulting in severe food insecurities. The climate induced food insecurities are however not unique to Dewedzo as it is generally a national challenge in the country.

5.3. Government Initiatives to Reduce Rural Energy Poverty and Its Effects

The Zimbabwean government has through an Act of parliament (the Rural Electrification Fund Act Chapter 13:20 of 2002) created the Rural Electrification Agency which is charged with the responsibility of extending the national energy grid to rural communities (Mapako and Prasad 2007). The Act provides for the development of a rural electrification funding mechanism. The Rural Electrification Act also paved way for the REP which target electrification of rural growth points. In this study, it was observed that although the REP has benefited people of Dewedzo through the electrification of

the St. Bedes growth point, the majority of the people are still to benefit at household level. Electricity has remained largely confined to the growth, very few people managed to draw it into their households. The government has been castigated for its snail pace in rolling out the REP.

In a bid to improve accessibility of electricity, the Zimbabwean government in 2013 directed the Power utility company of Zimbabwe (ZESA) to write off a certain percentage on all customer electrical bills which had accumulated to several thousands per household (Share 2014). The government's directive was reportedly in consideration of people's debts and their subsequent low incomes which could not afford to clear the areas and was necessitating their disconnection from the energy grid. However, this research observed that although the government implemented this initiative, the rural poor of Dewedzo did not benefit much as many of people already had no access to electricity.

5.4. Recommendations

5.4.1. Long Term Measures to Address Energy Poverty and its Allied Effects

It is an international fact that lack of access to modern energy services is a hurdle to the attainment of sustainable development (IEA (2013); The Economist Newspaper (2007); United Nations (2013), Gaye (2007) and Modi et al (2005)). Poverty of energy blocks several social and economic benefits which are necessary for rural transformation. Cognizant of the various challenges caused by the use traditional energy services, it is imperative that an alternative regime of modern energy services with improved efficiency and sustainability is harnessed for the rural poor. It is pertinent

that a sustainable energy regime to light up rural communities should be wary of the current income dynamics in these areas.

5.4.2. Developing Alternative Sustainable Energy Services

Perhaps developing alternative sustainable energy services such as large scale solar systems, wind energy and stand alone micro hydro power energy grids in rural communities will lower the cost of energy and improve accessibility of modern energy services in rural areas. The African Development Bank (2005) in its research found out that most communal areas in Zimbabwe have vast sustainable energy resources which have remained untapped. In the case of Dewedzo, wind energy, solar energy as well as extension of the national energy grid can be viable solutions to counter energy poverty. Being founded on a high ground frequented by strong and perennial winds, Dewedzo can develop a wind power project such as the Tamaruru and Dumbamwe Wind Power Development Project in Makoni Central district (Venema and Cisse 2004). More so, solar energy can be harnessed with equally competitive results.

5.4.3. Public-Private Partnerships (PPPs) in the Rural Energy Sector

It is possible and more sustainable to address energy needs and deficits in Dewedzo by adopting through a community ownership trust model in energy sector in which private capital can be mobilized to develop and exploit local energy sites and resources. Apparently, with their meagre earnings coupled with the current economic crunch in Zimbabwe, both the government and local authorities in Dewedzo cannot afford to effectively fund electrification programmes and this warrants the need to attract external capital and form PPPs. Not only should the government make available electricity to the

rural people of Dewedzo without addressing their poor income challenges. Through PPPs, local people can be able to extract some financial dividends from their partnership with the government and be able to sustain and honor their monthly energy bills.

5.4.4. Industrialization and Reindustrialization

When providing modern energy services to rural communities it is important that dynamics such as consumer needs, their preferences and their ultimate capacity to pay and maintain any proposed energy regime is taken into account. Electrification of rural communities alone without improving income opportunities for rural people cannot amount to rural transformation. The modernization perspective articulates how a modernized rural economy can be able to address issues of high unemployment, early mortality, poverty, food insecurity and illiteracy among others through industrialization. It is crucial that rural electrification programmes be accompanied by massive industrialization and reindustrialization programmes. Taking cognizance of the fact that rural people often lack capital which can allow them to start meaningful and sustainable businesses, the government ought to make available cheaper and easily accessible loans. To increase participation by local small scale farmers in an industrialized economy, a funding strategy in which the poor peasants of Dewedzo can use their livestock as collateral should be devised. Usually small and medium enterprises in Zimbabwe suffer a still birth due to poor capitalization. Through industrialized economies, people in rural areas can be able to access important goods at economic prices.

5.4.5. Improving rural-urban linkages

Most rural communities in Zimbabwe have poor linkages with their corresponding urban areas. A case in point is Dewedzo which is connected by gravel and poorly maintained roads to adjacent urban areas of Rusape and Marondera. Linking rural areas such as Dewedzo to urban centers can potentially increase the income pool for the rural poor. This will address the issue of low rural incomes, and will enable them to afford subscribing for modern energy services. Increasing rural-urban linkages can also facilitate the flow of market information to rural areas, improving recreational and sanitary amenities and creation of job opportunities for the rural people. More so, rural-urban linkages can address transport challenges and will result in the general improvement of rural infrastructure.

5.4.6. Ensuring the Security of Energy Supply

Providing energy services and failing to develop people's interests, understanding and appreciation of the value of the new energy powered technology and its vast applications and benefits will not in any way address energy poverty in rural areas. After providing rural people with modern energy services, it is important that awareness campaigns are held in order to enlighten people on how modern energy and its technological services can be harnessed to improve efficiency and sustainability in production. Crucial also is to develop and maintain people's trust and confidence in the efficacy and sustainability of the new energy service regimes. This can be achieved through guaranteeing the security of supply, adopting a sustainable and affordable pricing schedule as well as responding quickly to maintenance needs. Under the status quo, supply of energy by ZESA is heavily compromised by excessive and disruptive

load shedding, high estimated usage costs which are often disputed and poor maintenance.

5.4.7. Resettlement and Redesigning Rural Settlement Patterns

Resettlement of the rural population in a manner that allows supply of grid services should be considered. Most households in Dewedzo are haphazardly positioned. This makes distribution of grid services such as electricity, water and landline telephone services very expensive, difficult and in some instances impossible. Some houses are located in very steep and mountainous areas which cannot be reached with grid services. Redesigning of rural settlement patterns can also help to reduce the cost of providing rural people with grid services.

5.5. Short Term Measures to Reduce the Negative Impacts of Energy Poverty

Taking heed of the fact that development of enabling infrastructure and policies to promote easy and affordable access to modern energy services may take long, temporary measures need to be put in place to reduce the impacts of energy poverty. Debilitating impacts of energy poverty has been documented in terms of food security, malnutrition, poor incomes, high mortality rates and illiteracy.

5.5.1. Promote Food Crop Production

With all households in Dewedzo testifying that at one point or the other, they experienced critical food shortages, it is apparent that hunger and starvation are some of the challenges which need agent attention. It is recommendable that the government must promote the production of food crops. Most farmers are now focusing on cash crop production thus exposing themselves and the country at large to food shortages.

Also, the government must develop a communication strategy to supply rural farmers with crucial agricultural information which can assist them in deciding their planting dates, variety of crops to grow and other important information. Although these services are ostensibly available through the Agricultural Extension Services Department, the operations of the department are often disjointed, poorly coordinated and in some areas unavailable. In the meanwhile, the government should embark on a food aid relief programme to ensure that all people can have access adequate food in line with MDG1.

5.5.2. Devise Supplementary Nutritional Programmes for the Rural People

It also emerged in this study that, not only hunger is a challenge to the people of Dewedzo; the food they eat is often of poor quality. Notably, most energy poor households, in the study revealed that their food routinely comprise of sadza (pap) and green vegetables, they rarely have access to meat. Their daily meals thus lack some nutritional constituents which potentially undermine their growth and development as well as their general health. The challenge of poor nutrition is often hardest amongst children who may develop kwashiorkor and other related diseases. It is thus recommendable that the government and the private sector should consider starting school based nutritional programmes. Not only will developing school based nutritional programmes lead a health childhood, but it will also lure children to go to school and in that way, human capital can be effectively developed.

5.5.3. Solar Energy Lamps for Reading at Night

Still on the discourse of human development, it is very difficult for children from energy poor households to read and do their homework at night due to poor lighting. It is

important that a method of lighting specifically for reading purposes can be developed. Conceivably, a model of solar lamps introduced by ECONET Zimbabwe can be an appropriate mitigatory solution. ECONET Zimbabwe introduced solar lamps which uses very small solar panels which charges the lamp and can also charge cell phone devices (Newsday 2014). Making these solar lamps available and affordable for the rural poor can be an effective mitigatory measure which comes with several packages of benefits. The lamps improve children's night reading environments and it can also be used for general lighting in the entire household. The lamps also allow improved access to information as the system can charge cell phones and some models of the lamp are combined with a radio. However, the ECONET solar lamps are still expensive for most rural poor; a cheaper alternative should be developed.

5.5.4. De-gendering rural communities through effective and Practical Policies

Women and girls continue to suffer from societal patriarchal attitudes which are apparent at many levels of society in Zimbabwe, including at the work place, in schools, in the home and in the community (FAO 2011). In this research it was found that women and girls are the hardest hit victims of energy poverty. Their plight is even exacerbated by the burden of gathering fire wood for the household which is culturally believed to be a feminine chore. If the country is to go anywhere near achieving MDG 3 of gender equality and empowering women, it is imperious to de-gender rural communities. This can be done through opening up more opportunities for girls and women to acquire professional statuses in the rural economies. Empowered socially, economically and educationally, women can advance the agenda of rural transformation as they are the

ones who always stay permanently in the rural areas, for instance in this study, 66% of the investigated households were female headed while 34% were male headed.

5.5.5. Empowering Women with Decision Making abilities and Ownership of Economic Resources

Empowerment of women should entail the creation and prioritization of women in economic processes, decision making as well as their direct ownership and participation in development projects. Improving the energy situation of energy poor households in Dewedzo without corresponding improvements in gender policies which allow women to have ownership of businesses and other economic resources such as land will not help their situation. In his research on women in development in the post land reform period in Zimbabwe, Toro (2013) found that women do not own land and other economic resources which they use. He thus concluded that even after the land reform programme has been concluded, women have continued to be disenfranchised from mainstream economics of their societies. Similarly, providing rural communities with modern energy services without addressing their historical patriarchal exclusion from ownership of production resources will not change their status in society, in fact it will aggravate their disempowerment.

5.5.6. Increasing Educational Opportunities for Women and Girls

Taking cognizance of the centrality of education in modern day society, it is important that both the government and the private sector should converge on initiating a scholarship scheme targeting rural women to pursue careers in other non farm opportunities. Most rural communities place less value on women's education as

compared to that of men. Without education which gives them a sense of entitlement and dignity in society, the situation of women will continue to be in dire straits. Educational opportunities ought to be indiscriminately availed to women of all ages. Older women can be offered entrepreneurial courses while young girls should be promoted to go beyond primary and secondary education to attain tertiary qualifications.

5.6. Concluding Remarks

From the above discussion, it is apparent that poverty of energy undermines rural transformation efforts in Dewedzo. Energy poverty condemn the rural poor to various socioeconomic hardships which escalates their vulnerability to climate change, low incomes, hunger, gender inequality, high rates of mortality and other factors of underdevelopment. It is evident that addressing the energy needs of the rural poor in Dewedzo can provide the much needed ignition for rural transformation. More than anything else, the state of rural underdevelopment in Zimbabwe's country side requires technology based approaches to address its various faces. However, without improved access to modern energy services on which all technological gadgets, appliances and services are dependent, attempts to achieve MDGs will remain unachievable. In fact, it is conceivable that Dewedzo will most likely miss out on the government's efforts to eradicate poverty and extreme hunger as well as initiatives of gender equality and empowering women. However, by increasing accessibility of modern energy services and consideration of all the above mentioned suggestions and recommendations, there are higher prospects of achieving considerable rural development albeit this may require a period extending beyond the stipulated tenure of the MDGs. Important to include into future rural development agendas for the post MDG period in Zimbabwe is

serious reconsideration of development policies and their alignment with available energy options with special emphasis on making sustainable energy service a universal human right.

At an international level, the successor to MDGs should be able to articulate and demonstrate the centrality of modern energy and its accompanying technologies in development. Rather than increasing the rhetoric on making energy available to everyone, world leaders and international development agencies including the IMF, the World Bank and the United Nations should start to implement their pledges mostly in developing countries towards eradicating energy poverty.

5.7. Possible Areas for future Studies

From the gaps left by this research, future researchers can possibly develop grounds for further clarification of some aspects of energy poverty and underdevelopment. The following can be grounds for further research:

- The impact of energy poverty on public health
- The effects of energy poverty on climate change

6.1. Bibliography

Africa Renewable Energy Access (AFREA). (2012). Institutional Approaches to

Electrification: The Experience of Rural Energy Agencies/Rural Energy Funds in Sub Saharan Africa. Washington DC: The World Bank Group

African Development Bank. (2005). *Infrastructure and growth in Zimbabwe. An action plan for sustained strong economic growth*. Tunisia: African Development Bank Group.

African Development Bank. (2011). Emergency Power Infrastructure Rehabilitation Project. Project Appraisal Report. Zimbabwe: AfDB

African Economic Outlook.(2012). Angola. Sponsored by AfDB, UNDP and UNECA

Alfstad, T. (2005). Development of a least cost energy supply model for the SADC region. Capetown: University of Capetown.

Babbie, E., Mouton, J., Vorster, P., and Prozesky, B. ed. (2001). *The Practice of Social Research*. Cape Town: Oxford University Press.

Barzun, J. & Graff, H. F. (2004). *The modern researcher (6thed)*. Belmont, CA: Thomson/ Wordsworth.

Bernstein, H. (2007). *Modernisation theory and the Sociological study of development*. Sussex: Institute of Development Studies

Bradbrook, A, J. (2005). *Access to energy services in a human rights framework*. Australia: University of Adelaide

Central Intelligence Agency (CIA), (2002). *The World Fact book*. Bartleby Publishers: Washington D.C.

Central Statistical Office.(2012). *Census of Zimbabwe 2012*. Harare: Central Statistical

Office.

Chambers, R. (1983). *Rural Development: Putting the Last First*. London: Longman.

Chambers, R. and Conway, G. (1991). *Sustainable Rural Livelihoods: Practical Concepts for the 21st Century*. IDS Discussion Paper 296. New York: Institute of Development Studies

Chikanda, A. (2005). *Skilled health professionals' migration and its impact on health delivery in Zimbabwe*. WP-04-04. Cape Town. *Journal of Ethnic and Migration Studies*

Chimonyo, G.R., Mungure, S. and Scott, P. D. (2010). *The Social, Economic and Environmental Implications of Diamond Mining in Chiadzwa*. Zimbabwe: Sponsored by:

Cousins, B., and Scoones, I. (2009). *Contested paradigms of 'viability' in redistributive land reform: Perspectives from Southern Africa*. Working Paper for Livelihoods after Land Reform Project. Sponsored by the Economic and Social Research Council (ESRC). UK.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches (2nd ed)*. Thousand Oaks: Sage.

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 3rd Edition. Los Angeles: Sage Publications.

Denzin, N. K. and Lincoln, Y, S. (2000). *Handbook of qualitative research*. Thousand Oaks: Sage Publications.

Economic Consulting Associates and Practical Action Southern Africa. (2013).

Supportive Framework conditions for mini-grids, employing renewable and hybrid generation in the SADC region. Zimbabwe Case study- Gap Analysis and National Action Plan. Germany: European Union Energy Initiative.

ENENERGY RECIPES. (2011). *Country energy information Zimbabwe*:

<http://www.energyrecipes.org/reports/genericData/Africa/061129%20RECIPES%20country%20info%20Zimbabwe.pdf>

European Economic Area (EEA). (2006) *Sustainable development policy and guide for the EEA financial mechanism & the Norwegian financial mechanism*.

FAO. (2001). Human Energy Requirements: Report of a joint FAO/WHO/UNU Expert Consultation. Food and Nutrition. Technical Report Series1. Rome: FAO.

Food and Agriculture Organization. (2011). FAO- Nutrition Country Profiles (Zimbabwe). Rome: FAO of the United Nations.

Freedom house. (2012). Zimbabwe: Freedom on the net. Harare: Freedom House

Galang, R., (2002). Economic framework for the Chimanimani District. Sponsored by ZOIC, DTC, CBT and CRDC.

Gallopín, G. (2003). A Systems Approach to Sustainability and Sustainable Development. Santiago Chile: United Nations Publications.

Gaye, A. (2007). Human Development Report: *Fighting climate change: Human solidarity in a divided world*: Human Development Report Office Occasional Paper: UNDP.

Gregory, R. The EcoTipping Points Project: Models for Success in a Time of Crisis.

Retrieved from: <http://www.ecotippingpoints.org/our-stories/indepth/china-biogas.html> Accessed on 03/06/14

Grinnell, D. (1987). *Qualitative and Quantitative Approach*. Itasca: Illinois Peacek

Gwamuri, J. and Mhlanga, S. (2012) *Design of PV solar home system for use in urban*

Zimbabwe. Bulawayo Zimbabwe: National University of Science and Technology

Hopper, P. (2012). *Understanding Development: Issues and Debates*: UK: Polity Press.

Inglehart, R. and Welzel, C. (2005). *Modernization, Cultural Change and Democracy*:

The Human Development Sequence. New York: Cambridge University Press.

International Energy Agency (IEA), (2003). *World Energy Outlook*. France: International

Energy Agency.

International Energy Agency. (2008). *World Energy Outlook*. France: OECD/IEA

International Energy Agency. (2013). *World Energy Outlook: Modern Energy for all*.

Retrieved from:

<http://www.worldenergyoutlook.org/resources/energydevelopment/> Accessed on 14-05-14

Karver, J., Kenny, C. & Summer, A. (2012). *MDGs 2.0: What goals, targets, and time*

frame? CGD Working Paper 297. Washington, D. C.: Centre for Global Development.

Kjørven, O. (2012). *Case Studies of Sustainable Development in Practice: Triple Wins*

for Sustainable Development. United Nations Development Programme

Klein, H.K. and Myers, M.D. (1999). A set of principles for conducting and evaluating Interpretive field studies in information. *Management Information Systems Quarterly*, 23 (1), 67-88.

Kuhnen, F. (1987). *Causes of underdevelopment and concepts for development: An introduction to Development Theories*. The Journal of Institute of Development; Development Studies, Studies, NWFP Agricultural Vol. VIII, 1986, 1987 University: Peshawar.

Mapako, M. and Prasad, G. (2007). *Rural electrification in Zimbabwe reduces poverty by targeting income-generating activities*. Cape Town: University of Cape Town.

Martin, L. (2012). Dimensions of sustainability. Retrieved from:
<http://www.lord.ca/CulturalCapital/Spring2012/main-article.htm>. Accessed on 03-06-14

MDP Zimbabwe Project, (2013). Energy issues.
<https://sites.google.com/a/tcd.ie/mdp-zimbabwe-project/energy-issuesAssessed>
Accessed on 10/26/13

Ministry of Health and Child Welfare. (2010). National Child Survival Strategy for Zimbabwe 2010 – 2015. Harare: Ministry of Health and Child Welfare.

Mishra, V. (2003). Indoor air pollution from biomass combustion and acute respiratory illness in preschool age children in Zimbabwe. *Int J Epidemiol*; 32: 847-853

Modi, V., S. McDade, D. Lallement, and J. Saghir. (2005). *Energy and the millennium development goals*. New York: Energy Sector Management Assistance Programme, United Nations Development Programme, UN Millennium Project, and World Bank.

Moseley, W., G. (2007). *Taking Sides. Clashing views on African Issues/ Selected edited and with Introductions 2nd Ed.* Guilford

Moyo, S., Sill, M. & Okeefe, P. (1999). *Energy Policy and Planning in Southern Africa*. Harare: SARIPS of SAPES Trust.

Nenty, H,J. (2009). *Writing a qualitative Research thesis*. Botswana: Int J eduSci, 1 (1): 19-32. Kamla Raj.

NEPAD. (2012). Retrieved from: <http://www.mfa.gov.et/internationalMore.php?pg=32>
Accessed on 16-04-14

Neuman, W.L., (2011). *Social Research Methods: Qualitative and Quantitative approaches*. 7th Ed. Boston: Allyn and Bacon.

Newsday. (2014). *Woman raped as Son Watches*: Retrieved from: <https://www.newsday.co.zw/2013/03/29/woman-raped-as-son-watches/>
accessed on 16-04-14

Ogunlade, D. and Youba, S. (2002). *A new Sustainable Energy Path for African Development: Think Bigger Act Fast*. Cape Town: Energy and development Research Center.

Peet, R. (1999). *Theories of development/ Richard Peet with Elaine Hartwick*. New York: Guilford

- Poverty Reduction Forum Trust. (2011). Study on Rural Poverty in Manicaland: The Case of Mutare Rural. Zimbabwe: Poverty Reduction Forum Trust.
- Practical Action (2009) Energy Poverty: The hidden energy Crisis: United Kingdom: Practical Action.
- Rajasker, S. Philominathan, P and Chinnathambi, V. (2006). *Research methodology* India: AKGS Arts College.
- Republic of Zimbabwe Ministry of Energy Power and Development (ZMEPD). (2012). *National Energy Policy*. Harare. Government of Zimbabwe.
http://www.zera.co.zw/index_htm_files/Energy_Policy.pdf
- RERA. (2013). Supportive Framework Conditions for Mini-grids Employing Renewable and Hybrid Generation in the SADC Region. German: RECP
- Rist, G. (2002). The History of Development from Western Origins to Global Faith. 3rd Ed. London and New York: Zed Books.
- Ruiters, M. (2008). Gender instruments in Africa: Consolidating gains in Southern African Development. Midrand South Africa: Institute of Global Dialogue
- Samimi, C., and Wagensel, H. (1999). Geology of Eastern Highlands (Zimbabwe). German Nuremberg Kochstry: Institute of Geography, University of Erlangen.
- SAPES. (2001). SADC Country Studies: Zimbabwe. Harare: SAPES Books.
- Schuurman, F. J. (1993). Beyond the Impasse: New Directions in Development Theory. London: Zed books.
- Share, F. (2013). PDL Linked Pay for Civil Servants: Retrieved from:
<http://www.herald.co.zw/pay-deal-for-civil-servants-2/> Accessed on 08-02-14
- Shepard, J.M. 2002. *Sociology*. Eighth edition. USA: Wordsworth.

Smith, B. C. (2003). *Understanding third world politics: Theories of political change and development*. (2nd edition). New York: Palgrave Macmillan.

So, A. Y. (1990). *Social change and development: Modernisation, dependency and world system theories*. Newburg Park, California: SAGE Publications.

Strangecosmos. (2014). Retrieved from:

<http://www.strangecosmos.com/content/item/2325.html>. Accessed on 02-06-12

The Centre For Research and Development (CRD), Open Society Initiative For Southern Africa (OSISA) and Southern Africa Resource Watch (SARW).

The Economist Newspaper. (2007). Electricity in Africa: The Dark Continent. Retrieved From: <http://www.economist.com/node/9660077> Accessed on 28-05-14

The Hansard, (2001).Parliament of Zimbabwe.House of Assembly. Harare: Zimbabwe.

The OPEC Fund for International Development (OFID). (2008). Energy Poverty in Africa: Proceedings of a Workshop held by OFID in Abuja Nigeria. June 8 – 10 2008. OFID Pamphlet series 39.Viena Australia.

The Rural Electrification Agency.

<http://www.energy.gov.zw/index.php/powerdevelopment/rural-electrification-programme>: Accessed on 13 October 2013.

The Secretary General's Advisory Group on Energy and Climate Change (AGECC). (2010). *Energy for a Sustainable Future: Report and Recommendations*. New York. United Nations.

Tietenberg, T. & Lewis, L. (2010). *Environmental economics and policy*. Cape Town: Pearson

- Toro, B. (2013). Rural Women and the Land Question in Zimbabwe; The case of Manicaland Province. Masters thesis: Alice: University of Fort Hare
- Tungodden, B. (2001). A balanced view of development as freedom. Norway: Chr Michelsen Institute
- UNDP. (2001). Human Development Report. Making New Technologies Work for Human Development. New York: Oxford University Press.
- UNDP. (2001). Partnerships to fight Poverty. UNDP Annual Report. USA: UNDP
- UNDP. (2005). *Energizing the Millennium Development Goals: A Guide to Energy's Role in Reducing Poverty*. United Nations Development Programme: New York.
- United Nations. (2012). UN System Task Team on the Post- 2015 UN Development Agenda to foster Development: Lessons for the post-2015 UN Development Agenda: Discussion Note: UN Task team on the post- 2015 UN Development Agenda.
- United Nations. (2013). *A New Global Partnership: Eradicate Poverty And Transform Economies through Sustainable Development*. New York. United Nations Publications
- Utete, C.M.B., (2003). Report of the Presidential Land Review Committee. To his Excellence the President of the Republic of Zimbabwe.Zimbabwe Government Printers.Volume 2, Special Studies.
- Van der Hoeven, R. (2012). *UN System Task Team on the Post-2015 UN Development Agenda: MDGs post 2015: Beacons in turbulent times or false lights?.New York: United Nations*

Venema, H., D. and Cisse, M. (2004) *Seeing the Light: Adapting to Climate Change with Decentralized Renewable Energy in Developing Countries*. Canada: IISD

Venema, H.D. (ed) (2004). *Seeing the Light: Adapting to climate change with decentralized renewable energy in developing countries*. Canada: International Institute for Sustainable Development

Welman, C., Kruger, C. and Mitchell, B. (2006). *Research Methodology: For the Business and Administrative Sciences*. Oxford: Oxford University Press.

Wikipedia. (2014). Manicaland Province of Zimbabwe:

http://en.wikipedia.org/wiki/Manicaland_Province Accessed on 18 March 2014.

Willis, K. (2011). *Theories and practices of development*.(Sixth edition). Abingdon Oxon: Routledge.

World Bank. (2003). *African Development Bank Indicators*. The international Bank for Reconstruction and Development: World Bank Publications.

ZERA. (2012). *Media Statement*. Harare: ZERA

Zimbabwe National Statistics Agency. (2012). *Zimbabwe Demographic and Health Survey 2010-11*. Harare. Zimbabwe National Statistics Agency and ICF International, Inc. Calverton, Maryland USA.

Appendices

7.1. Appendix 1: Interview Guide

Interview Guide

Energy and Sustainable Development: The Case of Dewedzo Rural Community in Zimbabwe

This research is conducted by Mr. S.P Mbulayi in fulfillment for the requirements of Masters of Social Sciences in Development Studies.

Addendum A: Demographic Information

Interview Schedule Number	Date.....2013
Village.....	Type of Energy used.....

1. Sex	Male	1
	Female	2
2. Age		
	12 – 18 years	1
	18 – 24 years	2
	24 – 30 years	3
	30 – 36 years	4
	36 – 42 years	5
	42 – 48 years	6
	48+ years	7
3. Educational Level		
	Primary	1
	Secondary	2
	High School	3
	Polytechnic	4
	University	5
	Other	6

4. Size of the household

One	1
Two	2
Three	3
Four	4
Five (+)	5

5. Monthly Income (US dollars)

\$1 - \$50	1
\$50 - \$100	2
\$100 - \$150	3
\$150 - \$200	4
\$200 – \$250	5
Other (specify)	6

ENERGY AND SUSTAINABLE DEVELOPMENT

6. Which of the following energy sources are you using in your home?

Electricity	1
Wood	2
Charcoal	3
Cow dung	4
Solar	5
Other (specify)	6

7. From the following options, which one best describes how you feel about the type of energy which are using?

Happy	1
Somewhat happy	2
Very happy	3
Somewhat not happy	4
Not happy at all	5

8. Roughly, can you estimate the amount of money you spent on acquiring energy resources?

\$1 - \$20	1
\$20 - \$40	2
\$40 - \$60	3
\$60 - \$80	4
\$80 - \$100	5
Don't know	6

9. If you don't use electricity as your source of energy, can you estimate the duration or time you would need to gather enough energy resources for your household

- 30 minutes per day 1
- 1 hour per day 2
- 2 hours per day 3
- 3 hours or more 4

10. Can you explain your feelings and experiences regarding the effects of using the type of energy which you are currently using?

.....
.....

11. If your response to question (6) was not 1 or 5, move the next question (12). Do you think that if you were to change the type of energy you are currently using, you would significantly improve your social and economic wellbeing?

- Definitely 1
- Maybe 2
- No 3
- Don't know 4

12. Answer this question if your answer to question 6 was either 1 or 5. Would you say, using electricity improved your life style and productivity? Please explain how and why

.....
.....

13. If you rely on on wood fuel or any other biomass fuel, how easy is it to get it? Please explain

.....
.....

14. What are the main activities for which you use or require energy?

- Cooking 1
- Heating in the home 2
- Back yard industry 3
- Enabling agricultural implements 4
- Communication (radios, televisions and phones) 5
- Reading at night 6
- Other (specify) 7

GENDER AND ENERGY IN DEVELOPMENT

22. If the principal source of energy used is not electricity, who is responsible for gathering energy resources in your home?

- Father 1
- Mother 2
- Children 3
- Other specify 4

23. Can you please explain your answer in question 22 above

.....
.....

24. Are women involved in decision of the type of energy used in the household? If so please explain.

.....
.....

25. Would you say using electricity will increase the opportunities of women in Dewedzo? Please explain

.....
.....

ENERGY AND HUMAN CAPACITY DEVELOPMENT

26. Do you think that lack of access/access to electricity is having an effect on your children's education?

27. Please elaborate

.....
.....

28. Do you have any skill(s) which are being enhanced/ undermined due to the lack/access to modern energy services? Please explain which and how?

.....
.....

29. Which method of communication do you use and how reliable is it when considered in the context of the type of energy you are using? Please elaborate

.....
.....

30. To what extent do you agree that lack of access to electricity compromises/enhances your access to information?

- Strongly agree 1
- Somewhat agree 2
- Don't agree 3
- Strongly disagree 4

ENERGY AND HEALTH

31. Do you think the type of energy which you are using impacts negatively on your health?

- Yes 1
- No 2

Please explain

.....
.....

ENERGY AND AGRICULTURAL TRANSFORMATION

32. Do you think the energy services you are using have an impact on your agricultural practices?

33. Please explain

.....
.....

ENERGY AND FOOD SECURITY

34. Have you ever sought food relief?

.....
.....

35. How many meals do members of your household have per day?

- 1
- 2
- 3

36. What is included in your typical daily meal?

.....
.....

37. How often do you get meat in your meal?

- Everyday
- Once in a week
- One in a month

RECOMMENDATIONS

38. Are there any recommendations which you would like to suggest regarding the issue of energy and sustainable development? Please state

.....
.....

Thank you once again for your participation.

7.2 Appendix 2: Ethical Clearance



University of Fort Hare
Together in Excellence

ETHICAL CLEARANCE CERTIFICATE

Certificate Reference Number: RAH071SMBU01

Project title: **Energy and Sustainable development: The case of Dewedzo Rural Community in Zimbabwe**

Nature of Project: Masters

Principal Researcher: Shingirai Paul Mbulayi

Supervisor: Prof A Rahim

Co-supervisor:

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instrument(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the UREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

Special conditions: Research that includes children as per the official regulations of the act must take the following into account:


Note: The UREC is aware of the provisions of s71 of the National Health Act 61 of 2003 and that matters pertaining to obtaining the Minister's consent are under discussion and remain unresolved. Nonetheless, as was decided at a meeting between the National Health Research Ethics Committee and stakeholders on 6 June 2013, university ethics committees may continue to grant ethical clearance for research involving children without the Minister's consent, provided that the prescripts of the previous rules have been met. This certificate is granted in terms of this agreement.

The UREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
 - Any unethical principal or practices are revealed or suspected
 - Relevant information has been withheld or misrepresented
 - Regulatory changes of whatsoever nature so require
 - The conditions contained in the Certificate have not been adhered to
- Request access to any information or data at any time during the course or after completion of the project.
- In addition to the need to comply with the highest level of ethical conduct principle investigators must report back annually as an evaluation and monitoring mechanism on the progress being made by the research. Such a report must be sent to the Dean of Research's office

The Ethics Committee wished you well in your research.

Yours sincerely


Professor Gideon de Wet
Dean of Research

11 March 2014