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An examination of the natural resource asset base of rural households: A case study of
KwaDube, a rural community in KwaZulu-Natal, South Africa

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ABSTRACT

The spotlight on rural developed and sustainable livelihoods has increased over the years. Additionally, the importance of natural resources (specifically in poorer contexts and rural areas that have limited infrastructure and services) is well documented. This research focuses on examining the natural resource asset base of rural households in KwaDube, a rural community in KwaZulu-Natal, South Africa. It argues that natural resources are central to rural households. The research further asserts that, for rural households to have sustainable livelihoods, their natural resources should be available, diverse and accessible. A diverse natural resource asset base provides rural households with a variety of strategies and means for strong livelihood outcomes and coping mechanisms during times of shocks and stress. The research establishes that KwaDube has 28 natural resources used by households of which land is the primary resource. However, households of KwaDube have limited control and access to land and other natural resources in their community. Research further establishes that due to the influence of patriarchal traditions which favor men over women in the allocation of resources and opportunities, there is limited equitable access to natural resources. Added to the impact of patriarchy, this study observes that the other main challenge to natural resource accessibility and use is the continuity of Apartheid policies and traditional administrative arrangements which provided access and entitlements to specific groups of people at the expense of others (age, race and gender). The research notes the numerous challenges faced by rural households that highlight their inability to have adequate resources. There is generally very little if any ownership in the form of private property. The available natural resources such as land, forests and water are public property and are degraded. There are inadequate laws protecting use of public property, hence households find themselves exposed to over-consumed natural resources associated with the tragedy of the commons. Diminishing resources mean households continue to struggle to build strong natural resource asset bases. Consequently, households adopt livelihood strategies that are survivalist in nature such as seeking jobs elsewhere, diversifying their income by engaging in off-farm employment and engaging in petty trade using some of the natural resources in KwaDube.

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PREFACE

I declare that this dissertation is my own work, and that all sources utilised or quoted have been appropriately acknowledged and referenced. This dissertation is being submitted for the Degree of Master of Social Science at the University of KwaZulu-Natal, and has not been submitted for a degree or examination at any other university.

Zanele Furusa

Signed

A handwritten signature in blue ink, consisting of several overlapping loops and a horizontal stroke extending to the right.

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LIST OF ABBREVIATIONS AND ACRONYMS

AFRA	Association for the Rural Advancement
AIDS	Acquired Immunodeficiency Syndrome
ATM	Automated Teller Machines
BIG	Basic Income Grant
CAMPFIRE	Communal Areas Management Program for Indigenous Resources
CBNRM	Community-based natural resource management
DFID	British Department for International Development
EAs	Enumerator Areas
EFA	Education For All
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GDP	Global Development Program
GEF	Global Environmental Facility
GHF	Global Humanitarian Forum
GHS	General Household Survey
GIS	Geographical Information Systems
GPS	Geographic Positioning System
HIV	Human Immunodeficiency Virus
ICRW	International Center for Research on Women
IFAD	International Fund for Agricultural Development
IOM	International Organization for Migration (IOM)
IWFP	Indigenous Wild Foods and Plants
NGOs	Non-governmental organization
NTFPs	Non-Timber Forest products
PDLA	Provincial Departments of Land Affairs
PTO	Permission to Occupy
SADC	Southern African Development Community
SLA	Sustainable Livelihoods Approach
SLAG	Settlement/ Land Acquisition Grant
SLF	Sustainable Livelihoods Framework
SSA	Sub-Saharan Africa
TBNRM	Trans-boundary natural resource management
UNDAW	United Nations Division for the Advancement of Women
USAID	United States Agency for International Development
VIP	Ventilated Improved Pit Latrine
WDR	World Development Report

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter introduces the dissertation focus by presenting the main research problem and providing a motivation for the study. It presents that aim, objectives and research questions that frame the dissertation. A chapter outline for the rest of the dissertation is also provided.

1.2 Background and outline of research problem

The need for rural development in postcolonial Africa has brought increased research attention on household assets as sources of sustainable livelihoods. This is typical of rural South Africa where colonialism and Apartheid have shaped poverty along racial lines leaving disadvantaged groups with scant resources and ravaging poverty levels (Shinns and Lyne, 2005: 158). Consequently, researchers are embarking on studies to find out what natural resources and assets more generally rural communities have and how they use these assets to achieve sustainable livelihoods and also curtail the detrimental effects of poverty (Pimentel, 2006). Barbier (2012) asserts that much of the rural poor (who are increasing in numbers) are concentrated in ecologically fragile and remote areas, and there is a high reliance on natural resources to survive. Barbier (2012) further indicates that the ecological scarcity problem (as a result of declining natural resources and population increases) has resulted in a vicious cycle of declining livelihoods, increased ecological degradation and loss of resources commons, and declining ecosystem services on which the poor depend. Zimmer (2010) states that the inequitable access to and use of natural resources have contributed to conflicts on the African continent. According to Serrat (2008), these assets comprise of the natural, physical, social, human and financial components as per the Sustainable Livelihoods Framework (SLF) presented later. These assets are also referred to as capital. This study will therefore regard assets, capital and resources to mean one and the same thing.

Mararike (1999: ii) defines rural resources as “things which people need in order to survive”. In support, Rugege et al (2008) indicate that these resources benefit households greatly in many ways. He cites examples such as fuelwood, wood for buildings, crafts and tools, food and medicinal plants, to name but a few. In addition, Barany et al (2005) state that trees in particular contribute to food and nutritional security of rural households, firewood for cooking, are used in income generating activities and can be essential in providing farm inputs such as natural fertilizer, animal fodder and building materials which are essential to the security of rural households. High and Shackleton (2004) suggest that rural people make use of a wide range of natural or “wild” resources obtained from communal lands around their settlements as well as from arable land and residential plots. This study examines the natural resource endowment of KwaDube, KwaZulu-Natal in order to trace the influence of natural resources on the livelihoods of the KwaDube community.

Pimentel (2006: 155) points out that “achieving future sustainability not only depends on the land, water, energy, and biological resources that support human life, but also on the number of humans who have to share these vital resources”. He views the increase in population in general to be one of the greatest drivers of natural resource scarcity and whose end result is increased vulnerability among rural households. Grimble et al (2002) agree with this viewpoint and also highlight that overpopulation in rural areas places pressure on the natural resource base. Grimble et al (2002: 1) observe that although there are controversies associated with this issue:

It has long been known that poverty and the environment are closely linked. Many millions of poor rural people are closely dependent on natural resources for their livelihoods and the abundance and condition of these resources has a major bearing on livelihood quality.

Rugege et al (2008), in support of this argument, stress that high levels of poverty together with the lack of employment opportunities in rural areas constrain the sustainable use of resources. Additionally, they see climate change as likely to increase negative impacts and further undermine the natural resource base, contributing to increased poverty and vulnerability in rural areas. The Global Humanitarian Forum (2009) also observed that climate change increases

vulnerability, and impacts on human lives, security, livelihoods, and natural resource. Also, Collier et al (2008) state that climate plays a key role in the well-being of the majority of Africans, especially in economies that are highly reliant on climate-driven natural resources. Additionally, Shackleton and Shackleton (2012) assert that increasing human vulnerability (as a results of climate changes and other impacts) results in even higher dependence on climate-affected resources, which further increases human vulnerability through resource competition and scarcity. They also state that conflicts themselves exacerbate vulnerability through environmental degradation as a result of the increased demand on resources as victims become impoverished and rely more on the natural resource base. Similar sentiments are expressed by Nelson (2012) whose edited volume indicates the challenges of natural resource governance in Africa, especially in the context where land contestation and community rights over resources remain unresolved. van der Ploeg (2011) indicates that access to natural resources can be a curse and/ or a blessing, showing why some countries benefit while others lose from the presence of natural resources.

An important contribution of this study is that it not only focuses on what natural resources are used in rural contexts (using the KwaDube case study) but that it also examines how natural resources impact on sustainable livelihoods. Particularly the focus is on the households' ability to make livelihood choices and related outcomes as well as coping strategies adopted. Barbier (2012) and Shackleton et al (2008) indicate that the importance of ecosystems in providing essential services to humankind has been ignored and suppressed resulting in the mismanagement, abuse and degradation of ecosystems and their resources.

Any research that seeks to identify and analyze the nature, availability and consumption of natural resources by households, will (of necessity) involve a discussion of the livelihoods of households. The term livelihoods, often associated with and used in reference to sustainable living, has been defined by Carney (1998: 2) as "comprising capabilities and assets (including materials and social resources) and activities required for a living". Rakodi (1999) indicates that households manipulate and put these resources to use in unique ways as dictated by their needs

and priorities. In doing so, Rakodi (1999) states that households will naturally experience times of shock and stress as a result of erratic and seasonal changes in climate (quite common currently due to the effects of global warming) or a shortage of labor due to illness, especially associated with Human immunodeficiency virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS), a pandemic that has complicated the lives of many of the rural poor in Africa (Mendel, 2005). According to Freeman et al (2004), unfavorable policy issues concerning land tenure in formerly colonized territories, especially of Africa, negatively impact on the utilization of natural resources by way of limiting accessibility. Freeman et al (2004) see land as crucial to livelihoods because it is the biophysical resource base which carries a range of other natural resources on it such as biodiversity. Bunce et al (2010) indicate that policy measures that allow for availability of land in particular, and natural resources in general, are central in sustainability debates.

Krüger (1998) highlights that natural resources have in recent years also contributed to emerging migration patterns between urban and rural areas of some of the southern African countries as these resources serve as a valuable safety net for city households with low incomes and uncertain livelihood prospects. van der Geest (2011) shows that in Ghana, north-south migration patterns are linked to environmental resource scarcity which indicates that environmental push factors are more powerful than environmental pull factors. Krüger (1998) indicates that this is so because the gap between real rural incomes and real urban incomes has narrowed considerably, thus increasing the necessity for some urban dwellers to fall back on rural assets for their own well-being. Such rural-urban linkages have become ubiquitous in Sub-Saharan Africa. The issues raised above are pertinent in the South African context. Ntsebeza (2007) particularly illustrates challenges and contestations pertaining to land assets in relation to post-Apartheid attempts to redress past imbalances. Jacobs et al (2011) indicate that there are a range of differences in relation to socio-economic (such as gender and poverty level), spatial and historical aspects that influence access to and control of assets in rural areas. Bob et al (2008) and Shackelton et al (2008) specifically unpack issues relating to natural resources in the South African context.

In view of all of this, it is clear that there is need to explore in depth, the natural resource base of communities and be able to realize their significance. This research provides an examination and analysis of the socio-economic profiles of households in rural KwaDube, KwaZulu-Natal in South Africa. It is a study of the how natural resources have enhanced and shaped the livelihoods of the rural households in this community. The study also focuses on the implications of using both public and private natural resource assets. Through the study of this rural community, research is hoped to clarify the factors that determine the decisions and choices made on natural assets stored and those exchanged or used to sustain households.

1.3 Research aim, objectives and questions

1.3.1 Aim

The aim of this study is to examine the natural resource asset base of rural communities in KwaDube, KwaZulu-Natal in relation to other types of assets, namely, physical, financial, human and social. These categories are derived from the SLF discussed below under section four of this chapter. This study therefore undertakes an audit specifically of natural assets in each of the categories. Furthermore, it examines the existence or lack of natural assets and their relationships to survival strategies and opportunities. Additionally, the research evaluates the power dynamics in relation to who controls and has access to these natural assets. The SLF therefore provides a useful structure to identify the interplay of the critical resources and assets at the community and household level, as discussed in this proposal.

1.3.2 Objectives

Emanating from the aim of the study, the specific objectives of this study are:

- To examine the socio-economic profile of households in KwaDube.
- To determine the key forms of natural resources assets that households are dependent on for their livelihoods.
- To assess the challenges and opportunities that rural households experience in relation to accessing and using natural resource assets.

- To assess how access to and control of natural resource assets influence household coping strategies, and how the adoption of specific strategies impact on future household assets and livelihoods.
- To make recommendations on how to enhance the natural resource asset base of rural households based on research findings.

1.3.3 Research questions

- What are the various natural resource assets that households own?
- What are the factors that influence why some households are better off than others in accumulating and using natural resources?
- Which natural resource assets are communal and which are privately owned?
- What challenges and opportunities do households experience in relation to accumulating natural resource assets?
- How much control do households have over natural resource assets?
- What coping mechanisms do they have during times of stress? What choices do the households have in the utilization of natural resource assets during shock and stress periods?
- What are some of the externalities that contribute to their ability or inability to access natural resources assets for sustainable livelihoods to be realized?

1.4 Chapter outline

Chapter two provides a general overview of the literature review paying attention to the scope, concerns, approaches, and conclusions of existing research on rural natural resource assets and sustainable livelihoods. It also identifies intellectual and research gaps in this area of study which the present research intends to fill. Furthermore, the conceptual framework (SLF) will be presented. Chapter three describes the case study and discusses the research methodology which the research uses. It discusses the methods used to collect primary data from KwaDube, KwaZulu (which is the target population) using various sampling approaches. The fourth chapter consists of a description and analysis of the data. The analysis is undertaken thematically

integrating both the quantitative and qualitative data collected. The fifth chapter gives the synopsis of the research. It also gives insights and recommendations useful for both academic purposes and policy reform.

1.5 Conclusion

This dissertation analyzes the socio-economic profile of households in KwaDube in KwaZulu-Natal focusing attention on the natural resource asset base that households are dependent on for their livelihoods. It covers challenges and opportunities that rural households experience in relation to accessing and using natural resource assets. It also provides recommendations arising from an analysis of data from surveys and focus groups from this community

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses documented research on natural resource assets used by rural households. This study acknowledges the critical significance and strong co-relation natural resources have with other human, social, financial and physical assets that households possess. This aspect is important in relation to the SLF presented later in this chapter.

This study is important in three primary ways: 1) it helps to establish approaches taken in the study of rural assets in general and also in particular, the natural resource base of households; 2) it illustrates scholarly contributions made already to the study of assets; and 3) it reveals gaps that exist in the knowledge on assets and gives validation for this research, which also acknowledges that natural resources play a vital role, if not the key determinant factor, in the livelihoods adopted by households in most rural communities. Bob (2008: 2) states that the natural world has been able “throughout the ages to provide people, either directly or indirectly, with the resources to address basic needs” and, therefore, it is paramount to pay great attention to them when studying rural households’ livelihoods. She also indicates that there is an intricate relationship between people and nature and stresses the importance of human-beings as the stewards and users of nature. According to Bob (2008: 1), households hold the prime position in the battle to achieve sustainable living in that they exert a “myriad of influences over the earth’s natural resource base”.

2.2 Rural development

Scholars agree that there is no common and acceptable definition of rural development. The concept has been used in innumerable ways, each with its own distinct focus. However, Anriquez and Stamulous (2007: 3) provide an overall common definition of rural development as, “development that benefits rural populations; where development is understood as the

sustained improvement of the population's standards of living or welfare". Consequently, rural development is seen as partly playing the role of empowering communities by building their capacity to be able to make sustainable priorities or choices in their livelihood activities in good times and times of shock and stress. Although there may be stimulation for development (especially through provision of financial resources) from other regions, every rural development strategy harnesses its local natural resources in order to bring about improved livelihoods to its low-income households and to the region in general. In analyzing the value of rural development, Anriquez and Stamulous (2007: 3) state:

...promotion of the rural economy in a sustainable way has the potential of increasing employment opportunities in rural areas, reducing regional income disparities, stemming pre-mature rural-urban migration, and ultimately reducing poverty at its very source. In addition, development of rural areas may contribute to the preservation of the rural landscape, the protection of indigenous cultures and traditions while rural societies could serve as a social buffer for the urban poor in periods of economic crisis or social urban unrest.

This line of argument is supported by the South African Year Book 2009/10 (Republic of South Africa, 2012) which states that wherever rural development is effected, it brings about stimulation in growth and promotes food security, which in turn will help to alleviate or reduce poverty. History shows that whilst some of these strategies are really dynamic they have in the past not necessarily achieved the intended goals and neither have they catered for the interests of the intended target population. Beaulieu (2002: 4), for example, observed:

...people being targeted with these programs or policies end up being consumers of such activities. In essence, they become dependent on those organizations and agencies that have implemented services to address certain local needs.

This creates a crisis in the future, when agencies pull out of these rural development projects because the households, who are supposed to be empowered for self sustenance, are not fully harnessed to engage in their own development.

Another noticeable feature in rural development is the gradual increase in manufacturing and service industries. Anriquez and Stamoulis (2007: 3) explain that this phenomenon in

development as stemming from the period around the 1960s and early 1970s when it was generally agreed that “intense industrialization was the main characteristic of the perceived development path” for rural economies. They argue that consequently, there has been noticeable division of labor in the rural areas between these predominantly urban industries and agricultural activities. Furthermore, they indicate that agriculture still remains one of the dominant rural activities, not only in sustaining rural communities, but also being a safety net for the urban poor. These industries are gradually replacing the dominant agrarian-based activities which have characterized rural economies for a very long time. In fact, the presence of natural resources, attract and also determine the nature of industries that will be established in the first place (Anriquez and Stamoulis, 2007). Domon (2011: 338) states that “while the economy of rural areas has always been strongly dependent on natural resource exploitation, recent technological advancements in exploitation, loss of rural livelihood, and increased social demand for the amenity aspects of these resources have dramatically changed rural economies”.

2.2.1 Natural resources and rural development

Shinns and Lyne (2005: 158) view economic wealth as derived “from assets that can generate income, capital gains or liquidity”. Their research emphasizes the key position held by assets in the rural development process. Assets (mainly focusing on natural resources) are seen as essential for any rural development strategy (Barbier, 2012; Mensah, 2012). Most literature addressing rural development pays special attention to asset availability, asset distribution and asset access. Some scholars believe that some rural areas are richly endowed with resources but due to lack of accessibility, lack of good knowledge of what the resources the area has as well as proper distribution, they are described as poor (Beaulieu, 2002; Mararike, 1999).

Most governments and non-governmental organizations (NGOs) engage in preliminary scrutiny of the natural resources available in rural areas and their accessibility to households. These institutions derive new and sustainable rural development strategies based largely on the resource stock of an area. They involve households in development projects so that the supposedly available resources can be harnessed and be fully utilized for the households’ benefit. Beaulieu

(2002: 14) calls it “asset mapping” which involves taking an inventory of what the community offers in order to manipulate these resources for the good of the whole community.

Whilst natural resources are the key ingredient to rural development (Domon, 2012; Nelson, 2012), there are often a wide range of challenges and management issues that are almost universal in their nature that stakeholders face. Some of these challenges, according to Chen and Chai (2010), include massive forest destruction, soil erosion, land degradation and water pollution, just to mention a few. They further assert that these environmental problems are a result of, and also lead to, overconsumption and deterioration of the environment. Such was the reason for the rise and widespread adoption of the concepts of sustainable development and sustainable living both of which focus on making sure that while needs of the current population are met, it is done in such a way that will not jeopardize future generations (Warhurst, 2002). The SLF that is based on promoting sustainability of ecosystems and livelihoods has been adopted as the conceptual framework for this study. This framework is used in guiding most development projects due to its ability to link people, their resources, activities, challenges and coping strategies for the challenges. This is discussed next.

2.2.2 Sustainable Livelihoods Framework

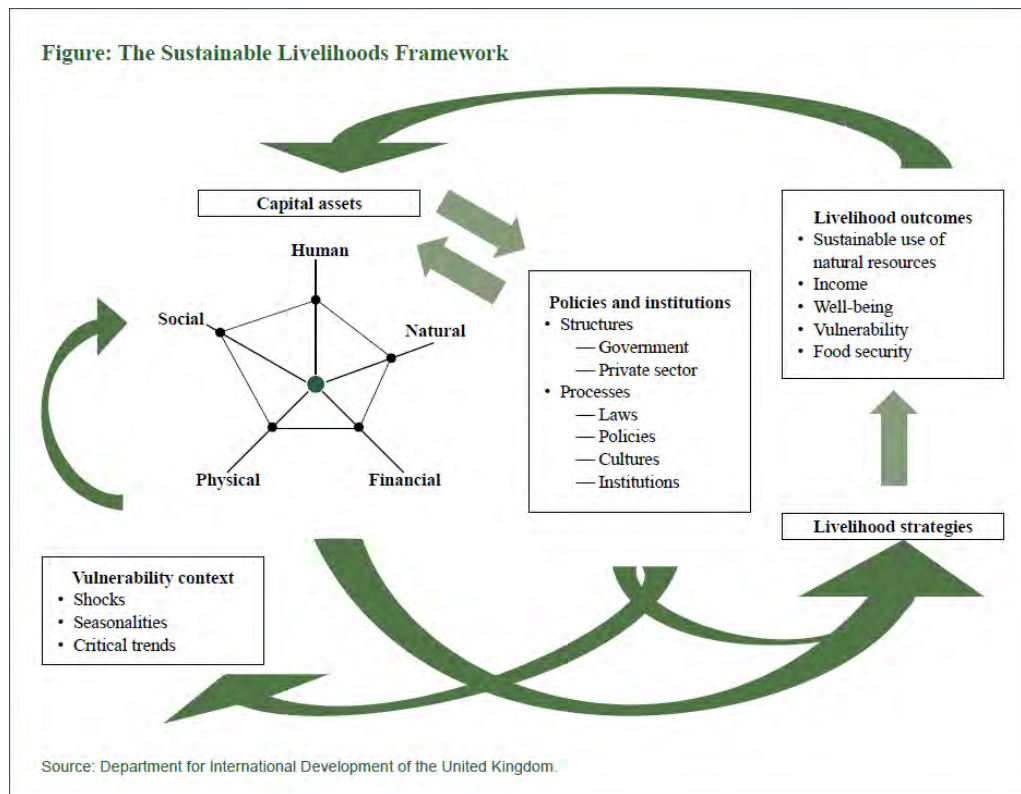
The SLF is a developmental framework that helps in understanding interconnections that exist among elements of rural livelihoods (Battersbury, 2008). Farrington et al (1999: 2) state that the SLF was born out of the desire by the British Department for International Development (DFID) to understand these connections which would clarify the “nature of poverty and how it may be addressed” in their bid to reduce poverty levels by half by 2015. This framework was developed on the basis of the concept of sustainable livelihoods developed by Robert Chambers (Kollmair and Gamper, 2002: 3) led to the emergence of the Sustainable Livelihoods Approach (SLA) in the 1990s. Chambers and Conway improved on it and came up with the most widely used definition of what sustainable livelihoods comprise (Houinato and Castro, 2009: 1): “a livelihood) can cope with and recover from stresses and shocks, and maintain or enhance its

capabilities and assets both now and in the future, while not undermining the natural resource base”.

The framework as an analytical device shows how households are able to utilize resources creating particular activities that enable them to survive. It presents an organized way to explore and critically scrutinize households in the light of what their environment offers (Battersbury 2008: 2). The application of this framework in this study is the key to understanding patterns that emerge in resource accumulation, use and even absence and how they shape the activities households adopt.

Figure 2.1 is a representation of the SLF. This flow diagram shows processes and intricate interconnections between the assets households have; the livelihood strategies they adopt; the livelihood outcomes they realize in doing so; assets accrued as a result of the activities; policies adopted which shape asset availability and accessibility; as well as vulnerability households experience and how this affects the asset base of the households (Serrat, 2008).

Figure 2.1: Sustainable Livelihoods Framework



Source: Serrat (2008: 2)

Farrington et al (1999: 1) provide some of the highlights of the advantages the SLF has brought to the rural development arena:

- It helps to bring together different perspectives on poverty and integrate the contributions to eliminating those different skills and sectors can make, for instance designing projects and programs, sector analysis and monitoring.
- It makes explicit the choices and possible trade-offs in planning and executing different development activities.
- It helps to identify the underlying constraints to improved livelihoods and the means of overcoming these.

- It helps to link improved micro-level understanding of poverty into policy and institutional change processes.

In addition, Battersbury (2008: 10) augments this view by stating that when working with communities, SLF makes one realize the “transferability of assets and capital switching”. Some of its greatest achievements lie in its compatibility with the dynamics of the rural communities. Because of its people-centeredness researchers find that the framework can easily be adaptable to varying circumstances and still allow for responses and participation as both governments and agencies apply policies that relate to livelihoods (Baumann, 2002: 3)

While success stories can be told about the SLF, Farrington et al (1999: 1) also draw attention to some challenges associated with its use as a conceptual framework for development which need to be addressed to improve its applicability which include:

- Understanding how conflict over access to resources impinges on livelihood choices and what can be done to address this.
- Developing cost-effective modes of livelihood analysis that ensure that the needs of the poorest are prioritized.
- Identifying appropriate in-country partners, and developing collaborative approaches to understanding the complexity of poverty and integrating that understanding into a common livelihoods frame.
- Understanding how, in practice, to handle trade-offs, for instance between local pressures (for example, for increased short-term income or better infrastructure) and wider concerns about resource sustainability and national-level policy considerations.

Although current debates indicate that the SLA is not tailor-made to suit every community (Houinato and Castro, 2009), its application in most projects is due to the participatory nature of its approach (putting households at the center). In some cases where its principles have been compromised, its effectiveness has not been substantial or long running (Houinato and Castro,

2009). Success stories of its application in some regions of the world have been highlighted. Oxfam in Great Britain, Africare (America) and many other United Nations sponsored development projects have carried out development poverty alleviation projects in rural communities of Africa, using this framework (Houinato and Castro, 2009).

Despite its strengths, Mensah (2012: 7) states that the SLF needs to be reconstructed since there is an argument that it tends to be ~~too~~ micro, too household focused, thereby limiting its utility as a micro-macro analytical tool for policy analysis and impact evaluation". In addressing this weakness, Mensah (2012) calls for assets (the focus of this research) to be elaborated on in the framework in relation to the degree of user rights that households are able to exercise rather than only dealing with the form in which they exist.

2.3 The importance of natural resources

It is widely acknowledged that natural resources are often the basis of livelihoods, especially in rural areas (Alemu, 2012; Barbier, 2012; Bob et al, 2008; Grimble et al, 2002; Roe et al, 2009; Shackleton et al, 2008; van der Ploeg, 2011). Households tap into these resources daily for survival. Bob et al (2008: 17) sum up the role of nature to human lives:

Nature as a resource provides, either directly or indirectly, material needs for food production, living space, health maintenance (including provision of medicines) and supply of energy and livelihood materials.

Bob et al (2008: 17) refer to human lives as ~~in~~extricably linked to nature and natural forces". While the importance of natural resources cannot be overemphasized, on the other hand, the role of humans in the longevity of nature is equally critical due to the stewardship role they play (Bob et al 2008: 18). This is recognizable in almost all rural economies where people tap heavily into agriculture, fisheries and forestry for a living. Bebbington (1999: 2022) states that ~~assets~~ give them (households) the capability to be and to act".

It is generally agreed that the value, availability and accessibility of natural resources varies between men and women because of gender differences that exist between them and the way

gender is often implicated in the distribution of and access to natural resources (Cotula and Cisse, 2007). Bob (1999: 110) defines gender as “socially constructed relationships between men and women”. As a result of these differences, marked variations in socio-cultural as well as economic needs and asset portfolios emerge between men and women even though they may live in one household. Perry et al (2010) indicate that women’s situations are often characterized by a lack of control or ownership of, and access to resources which impacts on them and their households achieving sustainable livelihoods and food security, thus women represent the most vulnerable of the vulnerable. Sims and Kienzile (2006) emphasize that it is very important for rural development projects to thoroughly observe gender relations in this light so that the strategies they apply to any community would cater for both women and men’s needs, especially if women are to be removed from marginalization.

Bob (2008: 110) further states that besides gender issues, the “question of who gets access and controls land resources” is also political. She says this is so because politics plays a significant role in the investment strategies of a region (often regarded as a way of economic liberalization), which may result in the infringement of households’ access to resources for livelihood purposes, which pose as one of the challenges to natural resource consumption. Cotula (2009: 2) substantiates this observation:

There have been sizeable increases in investment flows to several African countries in recent years, particularly in mining, petroleum and agriculture for food or fuel. While this may create livelihood opportunities, it also creates risks. Rural people may lose access to the resources they depend on, especially where their resource rights are weak, their capacity to enforce such rights is limited, and where major power asymmetries undermine their position in relation to governments and investors.

Bob (2008) and Cotula (2009) raise a crucial point about the importance of political decisions in determining the availability and accessibility of natural resources as economic opportunities for rural households. Commenting on the Foreign Direct Investment (FDI) in Africa, Cotula (2009: 3) observed that African governments oftentimes, for economic and political reasons, open up natural resources to foreign investors at the expense of rural households. Cotula (2009: 3) argues that with foreign investors’ increasing “interest in Africa's petroleum and minerals” as well as

–fertile land as a means of securing their supplies of food or biofuels”, there arises a stiff but silent competition for resources which at times goes unchecked or ignored for a very long time, thus disadvantaging rural households who may not have enough advocacy or resources to challenge such powerful competitors. He reports that households had limited access to resources in their own communities, which customarily belonged to them because the authorities chose to pay no attention to the people’s rights.

2.3.1 Types of natural resources

Ambler (1999: 1) defines natural resources or natural capital as “resource stocks from which resource flows and services useful for livelihoods”. These resources altogether make up what is known as the environment. Natural resources allow people to engage in activities such as farming, fishing, and hunting as well as mining. It is out of these extractive activities that household basic needs such as food, shelter, clothing and warmth are met. Their occurrence in most rural areas is the reason why some researchers such as Ambler (1999) argue that it is not proper to say rural areas are poor, but instead, are endowed with resources that have not been fully tapped.

Research on rural development generally shows that the majority of resources needed for survival come from basically one major source, the land (Bob 1999). This is so because the land has water bodies and forests out of which all the other resources are found. This is the reason why land is extremely precious to all rural households, and also why there are always land issues and conflicts in most regions. Serrat (2008: 2) classifies natural resources or natural capital under the following categories: land and produce, water and aquatic resources, trees and forest products, wildlife, wild foods and fibers, biodiversity and environmental.

2.3.1.1 Land

The Global Environmental Facility (GEF) (2010: 5) states that “land is the most important asset in agricultural production”. According to GEF (2010: 5), “Sub-Saharan Africa (SSA) has an estimated 2.4 billion hectares of which only 8% is arable and permanent cropland”. Holmberg

(2008: 23) further points out that this agricultural land, which is made up of 17.5% arable land (2.1% under permanent crop cultivation and 80.3% under permanent pasture) experiences different forms of degradation. Instability in any of these three areas means a great natural resource loss. The most affected are the soils that get exhausted rapidly, especially in arid lands already vulnerable to erratic rainfall patterns and extensive soil erosion. Sims and Kienzle (2006: xi) express their concern:

Another serious concern in SSA is that of soil degradation. The level of degradation varies considerably across the region and is difficult to quantify. However, some figures for soil erosion in Ethiopia were documented in 1988; they ranged from 16 to 300 tonnes of soil per year being washed away, with an average for the country of over 40 tonnes per year on cultivated land.

Mayrand et al (2005: 19) cite Burkina Faso as an example of a country of very high population density and very scant natural assets and fragile soils. They state that this is an example of one of the African nations with high vulnerability rates because 90% of its population is agricultural. They state that the conversion of not only Burkina Faso's but also any vulnerable nation's "fragile marginal drylands to agriculture, as well as improper agricultural, pastoral, and land management techniques are two of the most important drivers of land degradation and desertification" (Mayrand et al, 2005: 6). In addition, Mayrand et al (2005: 6) claim that "a global survey conducted in the early 1990s found that about 23% of all land used, including 38% of croplands and 21% of permanent pastures, was subject to degradation". Countries like Ethiopia and other highland nations have soils that, because of overexploitation, have come under "a vicious circle of falling yields, increasing poverty, continued exploitation of marginal lands (such as steep slopes or areas with insufficient rainfall), leading to further erosion and more poverty" (Holmberg, 2008: 24).

Research shows that failure to have access to land by most rural households is rooted in the unequal distribution of this resource due to colonial policies that segregated against non-whites who occupy rural areas, reserves or homelands (such as in the case of South Africa) (Freeman et

al, 2004). Ntsebeza (2007: 33) points out that South Africa, for example, just like all the other countries that achieved independence in Africa, had to engage in:

...land reform in order to address racial land inequalities inherited from colonial rule and apartheid. White settlers appropriated more than 90 percent of the South African land surface. The extent of land dispossession in South Africa has no parallel in any other African country.

According to Mararike (1999: 87), in most traditional African communities land in the countryside was communally owned by people and entrusted to the chiefs by the government who saw to it that families had plots to cultivate and graze animals, mostly communally. In each family the patriarch owned the family land and had the responsibility to divide it or pass it on at death. The fathers would pass it down to sons as generational inheritance. He outlines some of the basic ways in which individuals acquired land in the traditional African communities of Zimbabwe as follows:

Land was passed to male members through the male kin of the father's family. Secondly, land was acquired through well-established use rights (matongo). This practice meant that men generally obtained land from families in which they grew up. For women, land inheritance was maintained through the male relatives, known as patrilineal inheritance. However, if male relatives did not have sufficient land, needy adult persons turned to the village head for assistance. The family head was the one who allocated the different pieces of land to be used by members to grow food crops.

While women's livelihoods are based on access to land, some communities do not guarantee that it will always be available for them for survival. Female-headed households therefore face insecurity in the ownership of their land. Claassens (2007: 1) says this is so because "land is characterized as the property of the man and his natal family, and wives, sisters and daughters are not considered to have rights in the land". Thamaga-Chitja et al (2010) found that marriage was an important determinant to accessing land among female rural dwellers in KwaZulu-Natal.

It is imperative that the majority of the rural dwellers access land since they depend wholly or partially on agriculture for livelihoods (Mararike 1999). Its absence means high levels of insecurity for the family. Shreffler and Dodoo (2009: 79) concur with Mararike's view in the case

of Kenya. They state that 90% of rural Kenyans derive their livelihoods directly from the land. They further observe that over the years (Shreffer and Dodoo 2009: 79):

Rapid population growth due to high fertility rates in the past and declining mortality has resulted in land scarcity in many areas due in part to the traditional land tenure system in which parents divide their land equally among their sons.

Ubink and Quan (2008: 198) note that “land transactions have become increasingly monetized in recent years as a result of growing scarcity and increased land values”, the result of which is that “equity of customary tenure systems is being questioned”. This serves to show that there is a need for putting a system in place, through policy, to curtail authorities from transacting land in their own interests.

2.3.1.2 Water

Water is an important natural resource to all rural households. Its availability is paramount to human welfare and health as well as household nutrition especially in Africa, where the majority of the population depends on local rivers, most of which are seasonal, for water (de Wit and Stankiewicz, 2006: 1917). Holmberg (2008: 7), however, is concerned with the unavailability and inaccessibility of whatever water there is in Africa:

Africa is suffering from water scarcity and the situation is worsening: 340 million people already lack access to safe drinking water and almost 500 million, over half of all Africans, lack access to adequate sanitation. On the whole, countries in Africa are not on track to achieving the Millennium Development Goal targets on water supply and sanitation, with implications for, *inter alia*, child mortality and maternal health.

Reid and Vogel (2006), state that such a level of scarcity is a constraint to livelihoods and development in general. Studies indicate that households in rural communities often face conflict in the use of water among people, animals, agriculture and industrial use (Qadir et al, 2007; Varela-Ortega et al, 2011). Sometimes competition for water use is not only noted in its diminishing quantities or pollution levels, but also in real rivalries among communities (Ashton,

2002) whose households flank the source of this resource (which could be a river, dam, stream, lake, etc.) up or down-stream.

de Wit and Stankiewicz (2006) have observed that assets impact on one another. For example, the availability and access to water, makes available the healthier form of person-power to carry out farm activities in a timely fashion. Research has shown that that it is not always easy to establish permanent supplies of water. They further note that “change in climate would directly result in a change in surface water supply” (de Wit and Stankiewicz, 2006: 1917). They state that drainage patterns vary due to differences in vegetation cover and terrain and these tend to vary from one place to another. They observe that parts of Africa with “low rainfall, have virtually no perennial drainage” (de Wit and Stankiewicz, 2006: 1917). They further note that drainage density increases with increasing rainfall although there are exceptions to this relationship. For example, as de Wit and Stankiewicz (2006: 1917), explain, “in high-rainfall areas other factors, like vegetation, begin to play a role” which negatively impacts the drainage density. Barrios et al (2006: 361) also point out:

...long-run climate change scenarios tend to suggest that extreme climate variations and, more specifically, water shortages, are likely to cause abrupt changes in human settlements and urbanization patterns in sub-Saharan Africa more than anywhere else in the world. Changes in rainfall can potentially have a wide array of economic implications anywhere in the developing world given that rainfall is the main driver of water balance variability both over space and time. Historically, however, shortages in rainfall in Africa seem to have been associated with particularly damaging consequences, in the most extreme cases causing food and water deficiencies and the death and displacement of substantial shares of population. Part of the reason of why shortages in rainfall have been important for Africa is certainly due to the importance of the agricultural sector in its economies.

2.3.1.3 Forests

Shackleton et al (2008) point out that forests are an important natural resource to rural households of the developing world. They stress that forests have been the source of livelihoods to rural communities in particular since time immemorial and still do today. In reference to rural

South Africa (also true of other African rural communities), these scholars note (Shackleton et al, 2008: 558):

... a large proportion of the population makes use of forests and the resources from them. These are vital components of local livelihoods, which probably prevent people from slipping into deeper poverty. Additionally, the generally dry nature of forests in South Africa, coupled with the high unemployment rate, limit the extent of alternative locally based livelihood options, thereby magnifying the contributions from forests and forest products. The depressing effect of widespread HIV/AIDS on labor availability, economic activities, and livelihoods has exacerbated people's dependence on forest products.

In relation to HIV/AIDS, Hunter et al (2011) examine household strategies with regard to fuelwood and water among impoverished rural South African households (where there is already a high reliance on often declining natural resources) that have experienced a recent adult mortality. They found that there are higher levels of natural resource dependence among mortality-affected households and these households generally adopted different collection strategies.

Literature on natural resources indicates that forests provide a wide range of assets relating to flora, fauna and aquatic resources which include, but are not limited to edible leaves, edible roots (mostly for medicine), fruit, bark, honey, timber, firewood, reeds, game, fish, birds, crabs and other products made into implements or consumed directly (depending on the cultures and needs of the people) (Shumba, 2001). Amanor (2003: 3) discusses some of the products and bi-products of forest resources and their use, which contribute greatly to the resource base of West African households. Some trees are used for carving canoes, mortars, culinary, and furniture items; some bear fruits that provide important foods and condiments, including *Vitellaria paradoxa* (shea tree), *Parkia biglobosa* (locust bean), *Irvingia gabonensis* (wild mango), *Elaeis guineensis* (oil palm), *Borassus aethiopicum* (borassus palm) and *Cola nitida* (cola). Rattans and grasses are used for weaving baskets and furniture. There is a wide range of medicinal plants. Other species provide chewing sticks used for dental cleaning and sponges. In addition to being exploited for local consumption, many non-timber forest products (NTFPs) are sold in urban markets. Forests also provide important ecological services. Trees are often preserved on the

banks of streams and rivers and around headwaters to maintain water resources. Forests also provide bush-meat resources.

Cardenas (2004) regards forests as a source of numerous goods and facilities that bring great benefits not only to local residents but also other externalities. He cites the following among other purposes: biodiversity conservation, carbon sequestration, production and regulation of water, source of raw materials for a variety of industries ranging from pottery to high ranging timber manufacturing industries, livestock pastures, food and nursery services for coastal fisheries, nutrients recycling, firewood, habitat, protection against disasters and many others. Bass et al (2000) categorize these products into those for subsistence use (mainly food), farm inputs (implements), socio-cultural uses (for traditional ceremonies) and income generating products (those sold in exchange for money). Other scholars group these products into timber and NTFPs. This summary shows a strong correlation between availability of forests and livelihoods, especially among poor households. Other literature points out that, over the years, there has been a decline in the accessibility of these forests due to forest protection (with the advent of colonialism and new conservation policies) and in some cases depletion due to population pressure as more and more forests were isolated from village people such that households shared limited resources that were already, gradually diminishing (Mayers, 1997). The ability to make use of forest resources therefore depends on what skills households have to exploit what is within their reach and also with whatever infrastructure they have.

Amanor (2003: 7) also adds that through the practice of agro-forestry (an activity that scholars indicate goes as far back as the time of shifting cultivation in different parts of the world) trees protect crops, prevent soil erosion as well as contribute to the overall site productivity through nutrient recycling. Bass et al (2000: 11) support this line of argument in their observation that “agriculture and forests often co- exist in time and space” in supplying NTFPs. These comprise such forest products such as fruit, resin, leaves, honey, insects, seeds, flowers, mushroom, game bark, root, bulbs and many others. They also point out that forests also sustain the lives of billions of creatures from the tiniest life forms to large mammals, which offer their own value to

various households in different parts of the world (with bush meat being the most universal). This complex biodiversity is not only critical to the lives of the rural households but is also an important resource in the tourist industry that stands to benefit governments more than the households in surrounding areas. Specifically, Alcorn and Royo (2007) and Duffy (2010) assert that in the conservation sector, the establishment of protected areas and other state-managed areas, including forests and wetlands, have led to loss of livelihoods, forced displacements, declines in human security, as well as conflict between the state and local communities. Furthermore, Alcorn (2010) and Wambugu (2009) show that in east Africa (particularly Kenya, Tanzania, Uganda and Ethiopia) water policy frameworks which have prioritized wildlife tourism, horticulture and agriculture (as a results of perceived significance for economic growth) have resulted in pushing pastoralists off their land and have denied them access to dry season pasture resulting in conflict between different pastoral groups as relative scarcity increases. Nathan and Jodha (2002: 2) observe:

...in any NTFP market, that food insecure families sell their products at a lower rate than the market price often bartering their products for daily necessities. This interlocking of markets, whether for outputs and labor (forward sale of labor) leads to lower price realization on the part of food insecure families.

This explains why, in the commercialization of these forest products, those who make their sales in far away markets, such as those in urban areas, realize greater returns. Woodhouse (2002: 12) states that the collection of these NTFPs is part of a wide range of non-farm activities that households engage in, especially due to low levels of employment in rural areas. He, however, also highlights that due to varied climatic patterns, there may be seasons when this may not be a viable activity due to seasonal variations of river regions and grass cover that may lead to migration of certain species up or down stream and sometimes sheer lack of adequate human resources.

Nabanoga et al (2010: 1) bring to our attention that Uganda in particular considers its forests as very crucial in the development process of the nation and are key to the three pillars of

sustainable development, which are, ~~the~~ “the economy, society and the environment”. Their research shows that there has been great recognition of these aspects of forest resources, especially their value and impact on grassroots communities that formerly were overlooked due to overwhelming importance of timber production in both rural and urban economies.

In reference to one part of Uganda called Mabira, Nabanoga et al (2010: 12) indicate that it is ~~re~~ “considered to be a secondary forest, in which the distinctive vegetation types represent sub-climax communities, heavily influenced by man over prolonged periods”. This is evidence of overconsumption of forests largely through commercialization as well as the need for land for agriculture which when they go unchecked (as what happened in Mabira) can lead to the loss of precious natural resources. Nabanoga et al (2010: 14) point out that in the case of this conservation area, Mabira, various NGOs had to invest into the restoration process of the forests which included what they referred to as ~~nat~~ “natural regeneration” and ~~rest~~ “restoration activities”. They state that due to the rise in awareness of the importance of the NFTP, researchers have also recognized their importance and they have contributed in advocating for habitat protection and sustainable management of locally recognized sacred sites which house the majority of resources such as medicinal plants.

2.3.1.4 Wild foods

As part of the natural resources of any rural community, biodiversity is very crucial for livelihoods. Turbé et al (2010: 3) explain, ~~hu~~ “human societies rely on the vast diversity of benefits provided by nature such as food, fibers, construction materials, clean water, clean air and climate regulation”. Wild foods (most of which have been identified already under forests products) make up a significant part of biodiversity and also what households harvest from the ecological communities that surround them. Turbé et al’s (2010) foregoing argument suggests that wild foods make up a great part of what households consume from their local indigenous forests. The products are also referred to as Indigenous Wild Foods and Plants (IWFPs).

Researchers indicate that there has been limited data on IWFPs, especially in some parts of Africa, largely because of stigma associated with the consumption of wild foods, which oftentimes is seen as a sign of desperation and therefore households would prefer to withhold that kind of information. However, where inroads have been made, it is quite clear that there are numerous households that rely heavily on IWFPs for their survival (Grosskinsky and Gullick 2001: 2). Conclusions made by the United States Agency for International Development (USAID, 2001) show that the availability of wild foods helps in the diversification of the household diet. They also observed that most of the IWFPs are not only nutritive but are medicinal as well herbs that add taste to food as well as increase the ability of the body to metabolize the food with ease, especially when combined with other regular processed foods. Grosskinsky and Gullick (2001: 2) state that IWFPs:

...are crucial to people's survival during times of crop shortage. They are mainly collected by women and children and are used to protect family assets. They have particular economic importance to women, children and the poor.

Grosskinsky and Gullick (2001: 2) indicate that because of their contribution and potential to household livelihoods, most communities are beginning to domesticate most of these wild plants by growing them around the households for availability purposes. Grosskinsky and Gullick (2001: 2) further assert that some communities manage semi-wild or semi-domesticated IWFPs in "semi-managed gardens" in which they offer protection to naturally occurring IWFPs to allow growth and regrowth. The advantage of this process is that, growing in their natural environment, these IWFPs are already adapted to the climatic conditions and soils such that the households do not have to spend any of the already limited household time and resources to get extra inputs. However, the only concern is whether potency especially of herbs remains the same, especially when some of these herbs are brought under modern cultivation systems.

Grosskinsky and Gullick (2001: 4) also point out that despite their extreme value and effectiveness, some households in the Sudan and in other parts of North Eastern Africa, in general, have had limited access or are not able to take full advantage of IWFPs because of some of the following constraints:

- People are not aware of the potential
- Stigmas and traditional beliefs
- Loss of knowledge
- Insecurity limits access in some cases
- Displacement
- Marginalized because of preference for organizations to apply external solutions

There is therefore a need to raise awareness among households, especially as part of health and nutrition community development projects that are part of rural development mentioned earlier in the chapter.

2.4 Rural livelihood options

Most rural households are agrarian and make choices on how to utilize their resources to survive. In South Africa, agrarian activities play a key role in poverty reduction as highlighted by Statistics South Africa (2011). Availability or lack of natural resources plays a significant role in determining what options they adopt. However, there is new research that shows that more and more of the households are shifting from their dependence on land for living to new forms of income generation (Bryceson 1999: 4). Furthermore, Francis and Torell (2004) state that in most of East Africa's coastal communities (which is similar to KwaDube which is located in South Africa's East Coast) in rural and marginal areas, dependencies between these communities and natural resources linked to subsistence and informal sector livelihoods is strong. This section focuses on literature that outlines in general some of the regular livelihood options households follow and have adopted over time due to the quality and quantity of natural resources at their disposal.

Statistics South Africa (2011) examines the General Household Survey results in relation to food security and agriculture. The report asserts that –although South Africa is maintaining its ability to meet national food requirements, large-scale inequality and poverty mean that many households do not enjoy food security or adequate access to food” (Statistics South Africa, 2011:

ii). The report indicates that households headed by black Africans and those headed by females remain most vulnerable to hunger and adequate access to food. The report highlights the increasing importance of the cash-based orientation of rural livelihoods. An important aspect for consideration is whether the cash derived mainly from social grants and remittances is invested in the sustainability of the natural resource base in order to strengthen land or nature-based livelihoods, including agricultural practices. The reliance on cash-based livelihoods is contrary to popular associations of rural areas with agricultural activities. The report also underscores the importance of supporting agriculture in rural areas in the context of low job creation. It is important to note that while natural resources are deemed to be important to attain food security in general and promote agricultural production in particular, Statistics South Africa (2011) asserts that there is limited information available from the General Household Surveys on this aspect. Thus, studies that focus on the natural resource base are important contributions to better understand the relationships between this form of capital and livelihoods.

2.4.1 Agricultural activities

Bishop-Sambrook (2005: viii) considers agriculture as the “core of the rural livelihoods and has a major influence on the standards and quality of lives of millions of people”. This is so because households not only have food security, but also widen their asset base through the marketing of surplus produce. Holmberg (2008: 31) underscores this point when he states that it is estimated that a yield increase of 1% in Sub-Saharan Africa’s agricultural productivity has the ability of reducing poverty by 0.72%.

Dixon and Gulliver (2001: 3) have observed that all the major world rural agricultural regions, including Sub-Saharan Africa, aim at increasing yields every year. They further indicate that despite the increase in technology and productivity in the 21st century and the ability of people to be involved in trade, hunger is still notably prevalent in the world. Therefore, current rural development projects are focused on helping households evade this hunger and poverty in general. Most agricultural activities practiced by these rural households center around crop production, animal husbandry and mixed farming.

2.4.1.1 Crop production

As rural communities engage in crop cultivation, the focus is usually on a main crop that is the staple for the community. In Central and Southern Africa, for example, some common staples include cereals such as maize, wheat, barley, millet and sorghum and cassava (Hazell and Poulton 2007). Households often cultivate other sideline crops to supplement the staple food crop. Some of the common ones include various types of nuts, tubers and roots such as sweet potatoes, pumpkin, beans, vegetables as well as perennial tree crops such as bananas, mangos, citrus, guavas, coffee and cassava. Households largely depend on, and utilize to a great extent, natural resources that the land provides such as its natural fertility and rain during the rainy season to grow their crops. In some cases, where gardening is preferred over field farming, water from nearby streams may be essential to provide moisture in drier times (Monde et al, 2006). This improves the household's food security.

Monde et al (2006), however, point out that crop cultivation is now much more than getting food for the family. They argue that "people have expectations: they want to feed their animals; they want to earn money in order to satisfy other pressing needs like children's education" Monde et al (2006: 11). They assert that the continuous use of the same plots for the cultivation of a wide variety of crops in order to ensure increased yields to meet this demand has resulted in large scale depletion of the quality of their environment and availability of natural resources such as soil nutrients/fertility. Hence, erosion of soils has been unavoidable (Sims and Kienzle, 2006: xi). They further state that since natural fertility does not hold up much because of plot overuse, new technologies that have been introduced such as fertilizers and pest control substances to boost production have had their toll too in the resultant detriment to the soil.

Monde et al (2006) studied two South African rural communities of Guquka and Khayaletu, where they concluded that in recent years households no longer depend on the unreliability of crop cultivation. The constraints they face such as drought, lack of tenure security, lack of financial capital, poor soils and land degradation, and the removal of government subsidies culminating in "chronic production deficits" of resources has forced households in these

communities (also true of other communities) to depend on food from urban markets (Ninno 2007: 421). On the other hand, rural farm produce acts as a safety net for the urban poor. Tacoli (2011: 114) cites the case of Botswana where its urban poor “maintain livestock and farms in their own areas...and these assets are shared with and looked after by family members and contribute to the local economy”. She states that about half of the poor people in Gaborone (Botswana’s capital) have followed this practice for around twenty years. This is an example of how natural resources of any rural area are competed for and serve externalities and not just the current households found in the area.

2.4.1.2 Animal husbandry

The American Heritage Science Dictionary (2005) defines animal husbandry as the “branch of agriculture concerned with the care and breeding of domestic animals such as cattle, hogs, sheep, and horses”. According to the 2001 International Fund for Agricultural Development (IFAD) Report, nearly one billion head of livestock are kept by more than 600 million small farmers and herders in rural areas around the world (IFAD 2001). Weidman and Kilcher (2011: 2) provide the following list of some of the reasons why farmers keep livestock:

- Farm animals provide nutritious food in form of meat, milk, eggs and, therefore, contribute to a balanced diet of the farm family.
- They provide useful products that can be sold to the manufacturing industries such as horns, bones, hides and skins, giving the farmer extra income.
- Animals are a source of financial security; in urgent cases, the farmer can sell some of the animals to get money.
- Oxen, donkeys and horses provide draught power for soil cultivation and transport.
- Sheep and goats can be utilized to graze on rangelands that are not suitable for soil cultivation, hence increasing utilization of space on the farmland.
- Animals provide manure that is rich in nutrients and makes a highly valuable farm own fertilizer or a valuable source for making compost.

- On a farm that produces crops, animals can feed on crop remains and other waste products from harvesting, and thus contribute to recycling nutrients within the farm to feed the soil.

These rural households rear livestock at various scales ranging from just a few to large herds of commercially organized agricultural practices. The IFAD (2001) report points out that the livestock keepers could be:

...the rancher in Guatemala with a herd of cattle, the farmer in Bangladesh raising three chickens, the villager in the mountains of eastern Morocco keeping a single hive of bees. All hold livestock and all have a role to play in reducing poverty.

The common factor among these farmers is that they all use natural resources and other assets to sustain their herds. These resources come from what their ecosystems can provide. Sometimes they may struggle just to have enough biodiversity in their communities to sustain their herds. Weidman and Kilcher (2011) further refine the definition of animal husbandry by distinguishing organic animal husbandry from the inorganic. Differences between the two, has consequences on the levels of consumption of natural resources. Specifically, Weidman and Kilcher (2011: 1) point out:

Organic animal husbandry implies keeping animals in a natural way and promoting their welfare and health. This does not mean that animals need to be kept in an entirely natural environment, but that they are offered enough opportunities to perform their natural behavior and way of living... It is, therefore, very important to know the animals' intrinsic features very well and handle them accordingly, by keeping them in the appropriate environment.

According to Holmberg (2008), with the advent of colonialism as well as 21st century interventions by donor agencies in rural development projects, some controversies have risen in relation to agricultural practices. One such example given by Holmberg (2008: 31) is that of "misguided interventions by governments and donors" whose approach to improve livestock rearing is by destocking, an intervention strategy that has a preconceived notion that the large

herds of livestock owned by households are obviously causing overgrazing which ultimately leads to the degradation of ecosystems. This is contrary to the perceptions of the rural households who may be interested in having access to more land with a wider range of biodiversity.

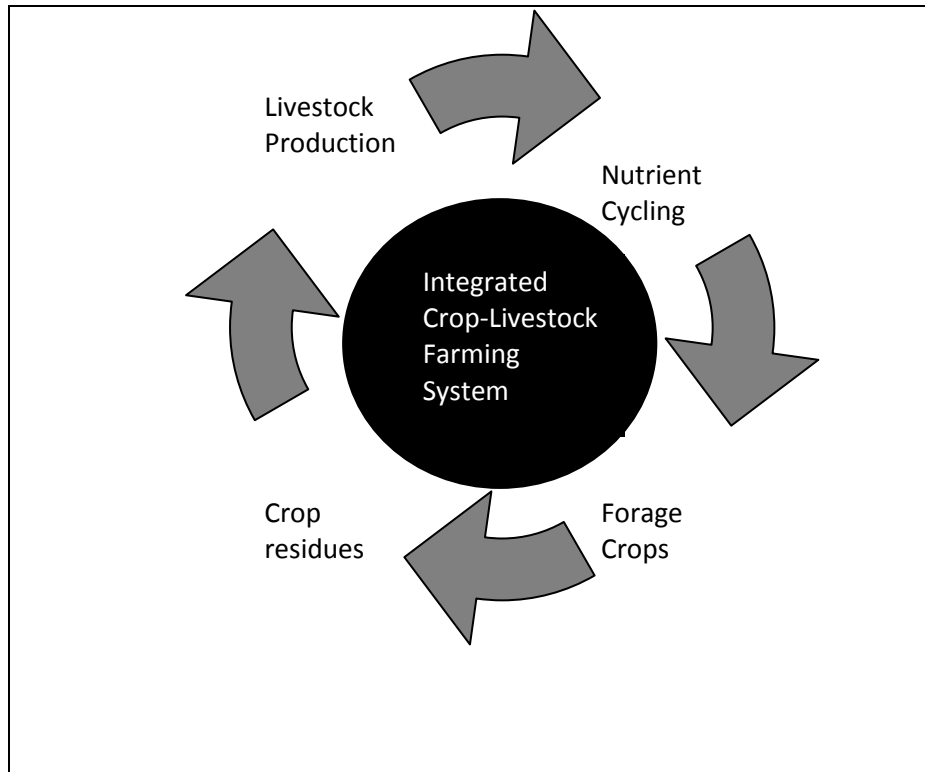
2.4.1.3 Mixed farming

Mixed farming is a common practice in almost all rural agricultural systems. In some cases it is referred to as integrated farming. Households grow crops and rear animals on the same farm. IFAD (2010) illustrates the interrelationship between crop farming and animal rearing in Figure 2.2. In this illustration, farmers grow crops including fodder for the animals (forage crops); they also use crop residues such as stalks to feed their livestock. This is particularly helpful in the drier months when there is little pasture. The livestock wastes or excreta that are rich in nutrients such as nitrogen, phosphorus and potassium (IFAD, 2001) from crop residue are used in the fields as soil fertility. There is therefore a continuous process of nutrient cycling between the livestock and the fields/ gardens so the farmer has a double benefit. IFAD (2001: 3) also indicates that the livestock excreta are also:

...the basis for the production of biogas and energy for household use (e.g. cooking, lighting) or for rural industries (e.g. powering mills and water pumps). Fuel in the form of biogas or dung cakes can replace charcoal and wood.

In support, Sumberg (2003: 253) also adds that in practicing mixed farming, households widen their food source and also bring numerous benefits to the farming processes such as “exchanges of grain, milk and manure, crop residue grazing, manure use and animal traction”. Rural households intensify their use of available natural resources to ensure stable food security, “a strategy very necessary especially to vulnerable economies” (Sumberg 2003: 262).

Figure 2.2: Integrated crop-livestock farming system



Source: Adapted from IFAD (2010: 2)

IFAD (2010) also adds that adopting this farming strategy prevents households from extracting more natural resources from the environment or using their stored assets to supplement the inadequate feed supplies, thus contributing to improved animal nutrition and productivity. In addition, rural households own different sizes of plots of land due to different land ownership policies whether they are traditional or central government policies. This has direct implications on the quality and quantities of natural resources at their exposure. Therefore, different (in size and shape) structural mixed farm patterns emerge. Sumberg (2003) compares two households, one middle income and the other poor, showing how differences in their circumstances in household size, plot size and options affect the resultant choice of crops grown and animals raised in typical rural communities with a similar resource base. They illustrate that farming systems in themselves, no matter how advantageous they are to households, do not have all the determining factors to a household's ability to access, control or use resources. Other factors

such as availability of human labor and ox-power are critical to the survival of a household as well as management of ecosystems. IFAD (2001: 1) draws attention to the fact that since integrated farming is indeed “stretching the capacity of existing production”, it can lead to devastated environments therefore undermining sustainable living. Hence, households need to incorporate improved environmental management systems which include “sufficient access to knowledge, assets and inputs to manage their own systems in a way that is economically and environmentally sustainable” (IFAD 2001: 3).

2.4.2 Diversification of activities and income

Several authors highlight the increasing importance of non-farm activities in relation to income generating activities and survival strategies with Babatunde and Qaim (2010) specifically highlighting its impacts of food security and improved nutrition. Reid and Vogel (2006) link this trend to multiple stressors that rural households face. Zuwarimwe and Kirsten (2010) indicate the importance of small-scale enterprise development in rural areas, using Zimbabwe as a case study. Briedenhann and Wickens (2004) and Mafunzwaina and Hugo (2005) illustrate the potential that tourism activities have to diversify rural economies. Sander and Maimbo (2003) stress the importance of migrant labor remittances in Africa.

Bryceson (1999: 2) points out the late nineteenth and early twentieth century has seen marked changes in agrarian reform in a process she calls “de-agrarianization” which involves a shift from the traditional “agrarian image” or “rural peasantry” look (especially in Sub-Saharan Africa) to become a society with diverse income generation activities. Barret et al (2001: 2) also acknowledge that this shift from sedentary and transhumance forms of farming have over the years accounted for 40% to 45% of household incomes. This off-farm income coming from non-farm activities, according to Bryceson (1999: 3), has given rise to rural populations who have become “more occupationally flexible and spatially mobile” and therefore consequently shifting the density of resource utilization from one area to another. These scholars also notice a shift in the level of utilization of household portfolio of assets accrued or produced as bi-products of other activities.

Overall, Barrett et al (2001: 369) conclude that diversification is therefore a product of “diminishing or time-varying returns to labor or land, from market failures, from *ex ante* risk management, and from *ex post* coping with adverse shocks”. In other words, households have to weigh advantages or options they have and choose a strategy that will maximize productivity and help them with opportunities to be free from poverty and not necessarily heavily depending on what the natural resources provide.

Although there is a notable shift in dependence on natural resources for survival, other findings show that the ability for households to make such maneuvers is their skills. Such findings bring to the attention of policy-makers issues that need to be addressed, especially constraints such as lack of trained person-power faced by sub-populations in poor regions even though the mainstream population of a nation at large, may not suffer under the same hindrances (Barret et al, 2001: 368).

It is important to note that some non-farm activities have always been in operation alongside sedentary agriculture but may have evolved to be more structured and market-oriented than subsistence agriculture. Escobal (2001: 497) observed that rural Lima, in Peru, is heavily indented with non-farm activities such as “manufacturing and services, both self employment e.g. operating a small handicraft enterprise, and wage employment”. Meert et al (2005: 81) support the engagement of households in non-farm activities citing that “off-farm employment is often the most accessible strategy, not only for the survival of the household, but also for supplementing the income necessary to maintain the farm activities”. They state that this is central to the discourses on natural resources asset base and sustainable livelihoods of rural households’ diversification of income protection vulnerability. The wisdom of having diverse sources of income is that certain species of livestock and crops, for example, will not be affected by environmental shocks the same way. Some of the species of crops and livestock will remain viable opportunities for income while others may be adversely affected. Scholars such as Escorbai (2001) and Meert et al (2005) focus primarily on identifying new income opportunities for disadvantaged households to diversify their economic resources and income sources like government-assisted grants, pensions and migration benefits such as remittances.

2.4.2.1 Migration

There is a strong correlation between natural resource extraction and the nature and quality of the human resources. Waller (2006: iii) points out that ~~it~~ is a human inclination to want to position oneself where conditions are best for personal fulfillment, growth and success. People migrate because they perceive their environment as inadequate in terms of what they desire or deserve". What it means therefore is that their access to their local resources (beyond the natural resources) is a great determining factor as to where they end up living. Restrictions that their environment offers therefore act as the push factors that reroute their life strategies. Waller (2006: iii) again points out that the dissatisfaction in individuals forces them ~~to~~ leave a sub-optimal environment in search of one in which they will be appreciated – through recognition or pay – and where they can develop their potential, live securely, work towards their goals and enjoy standards with which they align themselves".

2.4.2.2 Remittances

While migration in relation to laboring for others was seen as a sign of extreme poverty, there is increased acknowledgement of the benefits of migration through remittances. Taylor et al (2007: 2) point out that ~~m~~igration of labor out of rural areas and the flow of remittances from migrants to rural households is an increasingly important feature of less developed countries". It has become a phenomenon that has recently become a great source of alternative income for rural households, especially in the developing world where the greater part of the population struggles just to have decent livelihoods, mostly due to a lack of access to basic natural resources.

The examples below illustrate that whilst there is still a notable strain on resources in the receiving area, and notable consequences in outward migration such as depopulation of the sending area, there is, however, a remarkable reverse flow of assets to the area losing human capital. Talyor et al (2007: 2) note that in the case of Mexico where there has been, over the years, a perpetual increase in migration to the United State of America, there has been, ~~i~~ncreased per-capita incomes via remittances and also by raising land productivity in migrant-sending households".

Rwelamira and Kirsten (2003: 6) who studied the impact of outward migration on the sending household in the Limpopo province of South Africa observed that not only has income gotten from migration grown higher and higher in recent years but also that migrants have acted as great “financial intermediaries, bankrolling local production through remittances”. Their study of this community (which is true of other African rural communities too) made them conclude that due to improved skills level as well as access to capital assets, migrant workers have a great potential to raise levels and access to natural resource use and therefore general increase in agricultural output in their homes. These scholars also noted that the accessibility of natural resources is increased even though there is considerable loss of precious human resources. This in almost all cases has a negative multiplier effect of reduced production. However, family members use the received remittances to hire seasonal labor or extra help for their farm/ non-farm activities so as to be able to reach those natural resources that would otherwise be inaccessible. Nonetheless it is important to note that these situations tend to vary with each individual household. Kiiru (2010), in support of this argument, also points out that through this process, individual migrants are remarkably helping in reducing poverty and fighting economic crisis in their communities.

In response to the argument that remittances are generally used by recipients to cater for their basic needs such as children’s school fees, health food and other basic needs instead of a direct investment in the actual production process, Newland and Patrick (2004: 2) argue that this kind of prioritization is still good investment as it strengthens the “human capital as well as needed consumption”. They argue that this is necessary in the long run because of its multiplier effect in the community given by Orozco (2007) in reference to Latin American and the Caribbean nations. He states that remittances are crucial assets with an ability to transform lives through provision of daily material, social and financial needs of families which even goes on to include such investments as real estate strengthening, not only in the household but also community income. He observed that on average:

Remittance recipients spend money predominantly on basic food items needed to take care of households composed of an average of six members. The majority of the foodstuff purchased is locally or nationally produced, thus benefiting domestic producers

and the economy. Most remittance recipients also spend money on education, health and other services with an average expenditure of US\$500 a year on health and education. In fact, half of remittance recipients have made repairs on their home or invested in buying a new home in the past five years. One third of those homebuyers did so at the investment request of the relative living abroad. Moreover, half of remittance recipients have invested in some small business activity, most of which was also prompted by the remittance sender.

Cotula et al (2004) reiterate the importance of remittances and stress that the role of remittances cannot be overemphasized. They state that, however, where they are utilized, they play a big role in rural development as a whole and should be explored in the following three dimensions: the micro, meso and macro levels (the household, community and national levels), all of which are of great significance to the asset base of a nation. Their observation is also substantiated by Mohapatra et al (2009: 20) who state that “macro and micro-evidence indicate a positive role of remittances in preparing for and in coping with the consequences of natural disasters” experienced at all three levels. This general increase, interestingly enough, has been met with a general decline in aid in those very nations (Cotula et al, 2004).

As a nation undergoing rapid inflationary levels, not to mention political instability, Zimbabwe has had a great outward migration of its middle class (in particular) and its elite in search of better employment. Despite the brain drain (Chimbodza 2012: 4) and loss of valuable human assets, this has brought about notable financial contributions as remitters contribute to livelihoods of loved ones, a much needed relief which helped reduce heavy dependence on the already strained natural resources. An example of this would be a household that may choose to put solar paneling using the money received. The use of solar energy would not only relieve the pressure on resources but also be environmentally friendly since the new form of lighting and cooking would reduce dependence on firewood. Simple as it may sound, however, it goes a long way in showing how gradually more such cases may result in significant reduction in over-dependence on and harvesting of natural resources.

Remittances also play a significant role in the development projects in which households participate. Cotula et al (2004: 11) state:

...many communities benefit from development projects initiated and funded by associations of migrants overseas. Typical examples include the construction of schools, health centers, religious buildings, wells and irrigation schemes.

Nonetheless, Sander and Maimbo (2003: 17) emphasize that in most developing nations, use of remittances in investment such as in community businesses is comparatively much less than the for consumptive needs. Sander and Maimbo (2003: 17) note:

Investment in land, livestock, and in building or improving a home is also relatively common but secondary to daily needs and human capital expenses. Still, less is used for investments such as in saving, or business or to repay debt, such as a loan for the expenses of going abroad. Insecurity tends to be the main motivator for investment; the type of insecurity affects the type of investment.

In cases where remittances are used for investment purposes, Sander and Maimbo (2003) state that there is usually communal effort of putting together a fund by the migrants and consequently communal use of these resources in projects such as the construction or renovation of schools and churches. Such forms of investment though far and wide in some communities take place as a result of families that receive remittances giving to their associations or migrant workers donating directly to the associations of their own community. Sander and Maimbo (2003: 18) cite the case of Ghanaian migrants who have ~~kept~~ "kept afloat" some of Ghana's health institutions through remittances.

Scholars use the concept remittances at micro or smaller level to mean remittances used at individual or household level. Mohapatra et al (2009) conducted a detailed study of the role of remittances at the micro level in households in Ethiopia and observed that those households that received remittances experienced comparatively fewer shocks than the households without remittances at all. The remittances helped them to be well provided for and therefore guard against food shortages as well illnesses associated with food shortages as a result of improved

nutritional levels. Mohapatra et al (2009: 19) state that remittances therefore plays a major role of giving households security and also protect what normally would be liquid assets of the household in times of stress since the households do not end up selling ~~their~~ productive assets such as livestock to cope with shocks related to food shortages”. Households, therefore, use their cash to cope with shocks.

With regards to Africa, IFAD (2007: 9) reports that ~~over~~ thirty million people are in the Diaspora” and they are responsible for more than US\$40 billion in remittances from intra-regional, inter-regional migration and ~~international~~ migration to former European colonial powers such as France, the United Kingdom of Great Britain and Northern Ireland, the Netherlands and Italy, among other countries”. This report also indicates that ~~remittances~~ to rural areas are significant and predominantly related to intra-regional migration, particularly in Western and Southern Africa, where there is need, as indicated in the DFID (2005: 5) report, which shows that most rural households in Africa live on less than a dollar a day, and projections indicate that approximately 366 million people will be in that same situation by the year 2015. Such high levels of migration consequently attract high levels of remittances flowing to various parts of the continent. Sander and Maimbo (2003: 1) indicate:

For many African households and nations remittances are a tremendously important source of finance and foreign exchange, helping to stabilize irregular incomes and to build human and social capital.

Many nations in West Africa and Southern Africa are both migrant destinations as well as recipients of significant amounts of remittances. South Africa, for example, noted for its relatively incomparable wealth in the Southern African Development Community (SADC), has significant numbers of documented as well as undocumented workers from Zimbabwe, Swaziland, Lesotho, Malawi, Mozambique and Zambia not to mention those from the rest of the continent (Aliber, 2003; Truen et al, 2005). This is partly rooted in and also dates back to colonial times where migrant workers flocked to the South African mines for a livelihood (Truen et al, 2005). They also indicate that South Africa in particular and other nations in general receive a considerable flow of its revenue from inter-regional as well as through domestic

remitters (urban dwellers remitting cash to relatives who are rural dwellers). Truen et al (2005) further point out that it is very important to note that these nations do not actively promote outbound flows of remittances so most of these cash flows as well as flow of goods go through the informal systems. Truen et al (2005), using 2005 South African remittance data, emphasized the expanded role of transnational movements in general and South Africa, specifically, in increasing regional cash flows.

Truen et al (2005: 18) support their argument on increased remittance flows through examples of large annual percentages of remittances repatriated by some SADC nationalities from South Africa in particular and Africa in general:

- 60% of all migrants remit to their home country.
- All Mozambican mine workers are forced to repatriate 60% of income for 6 months of the year, while Lesotho mineworkers are forced to repatriate 30% for 10 months. Thereafter they are assumed to only remit 15% of income per month.
- Other migrants send R3 800 annually (just over 30% of monthly income at an income level of R1 000 per month).

There are several challenges related to the accessibility and use of remittances by rural households. Studies show that remittance services have always met with high service fees by the receiving agents in those receiving nations and the sender in the sending nation (Mohapatra et al, 2011). They also state that sometimes it is met with a lot of hindrances such as lack affordable payment points. Mohapatra et al (2011: 73) acknowledge:

Remittance markets in Africa remain relatively underdeveloped in terms of their financial infrastructure and the regulatory environment, but the rapid adoption of innovative money transfer technologies is transforming the landscape for remittances and broader financial services.

They also note the absence of modern, convenient, and accessible national payment systems (such as Automated Teller Machines - ATMs, and credit and debit cards) as one of the main challenges. They point out that this is even compounded and often a great challenge in rural

communities because in order to receive remittances they have to go to the nearest urban centers with an agent such as the Post Office, Western Union Services or Money-gram (for Southern Africa) or any other such agents. Furthermore, in both rural and urban areas, most recipients are tormented by ills associated with the cash and goods-flows such as fear, theft, robberies, family squabbles, petty jealousies and crime.

2.4.2.3 Grants

Monde et al (2006: 2), using rural economies of Guquka and Khayaletu in South Africa as examples of how households are taking advantage of new economic opportunities, state that rural households no longer just rely on tapping natural resources in their environment but also “rely on external economic activities, especially state grants for a means of living which contribute more than 90% to household income”. However, Aliber (2003: 481) cautions that social welfare for the rural poor in developing countries in the form of grants or pensions are very rare especially in monetary form, and where it is offered, the “grants are in no way sufficient to keep a household out of poverty”. In countries where grants are offered, it is still at a very low or almost insignificant level. In other countries such as South Africa grants are gradually turning into a very important source of income. Pauw and Mncube (2007: 2) state that social welfare in South Africa, for example, has been in existence for many years but has only been increased to cover more poor people, especially blacks, since 1994 owing to the efforts of the new independent government:

After coming to power in 1994, the ANC government committed itself to specific goals in the area of social policy, which included eliminating poverty, achieving an acceptable distribution of income lowering unemployment levels and increasing social assistance programs.

Seekings (2006: 6) made a similar argument a year earlier observing:

South Africa’s social assistance dates from the 1920s, but crucially was extended to African people in the 1940s, albeit with racially discriminatory benefit levels. It survived the early decades of apartheid, and in the last years of apartheid became a very generous system because the National Party was pushed to remove racial discrimination in benefits

by raising the benefits for black people up towards the benefits previously enjoyed by white people.

Other developing nations such as Brazil and Mexico have increased attention on the poor and their governments are giving struggling rural households grants so they can be able to survive. The common types of grants given include old-age pensions, child support grants, and survivor benefits (for eligible widows/widowers and orphans) and disability grants given to people who are physically or mentally incapacitated and are therefore not fit to be employed (Natrass, 2004: 8). Seekings (2006: 6) also states that in South Africa, for example, “a government means-tested disability grant of a maximum of R750 a month is available to all ‘severely physically and mentally disabled people’ older than 18 and younger than 65”. Such grants, he points out, can be given for short periods of time such as six months or may last as many as five years. Seekings (2006: 6) also observed that these kinds of grants come with a contingent measure which states that the recipients should be one that has absolutely no next of kin who can give them the needed assistance. As for Mexico and Brazil, they noted that recipients of child grants were means-tested and conditional on children attending school and/ or health care clinics.

With the advent of HIV/AIDS, some nations, South Africa being the leading nation in this category in Africa, give grants even though there is a lot of controversy surrounding selection of recipients as well as the stigma associated with it. Natrass (2004) reviewed the AIDS and disability grants in the rural community of Khayelitsha in South Africa and noted that due to the effectiveness of the antiretroviral drugs more people have been restored to good health. Consequently, they lose their disability grants, which make them bitter because they were now dependent on them for survival. Natrass (2004: 22) states:

Although this may sound far-fetched, there is anecdotal evidence from the Western Cape, the Eastern Cape and KwaZulu-Natal indicating that some people become angry when they test negative – saying that they were hoping to get the grant. In the Eastern Cape, there is a saying that you have ‘won the lotto’ if you test HIV-positive because it is seen as a ticket to the disability grant. If antiretroviral treatment is regarded (incorrectly) as a ‘cure’ for HIV, then it is possible that some people may desire to become HIV-positive under the mistaken notion that they will be able to get access to the disability grant and obtain antiretroviral treatment.

The controversy surrounding disability grants led Natrass (2004) to propose a Basic Income Grant (BIG) in its place. In this way, Natrass (2004) argues, the South African government can remove the stigma associated with the disability grant and avoid the moral and sensitive issues associated with it. Taylor Committee (2002: 101) points out that it is unclear to what extent the disability grant actually reaches the disabled people who need it...because the number of disabled people is unknown". Taylor Committee (2002: 101), further notes that a recent government inquest was made into social security in South Africa, and an observation was made which indicates that a total of 5% of the population is severely or moderately disabled. However, there are possibilities of more cases that remain unknown and therefore making the provision of grants hard to monitor precisely.

2.4.2.4 Pensions

Pensions are a great relief to rural households who have access to them. It widens their asset base and therefore their livelihood choices. They are a source of security, especially where people face hardships accessing resources or securing food for their families. HelpAge (2006: 2) defines pensions as –state provided non-contributory regular cash transfers to older citizens, given at specific ages in different countries". They supplement what the natural environment cannot provide. DFID (2005: 1) states that pensions:

...help tackle hunger, increase incomes, improve the education and health of the poorest families, promote gender equity and contribute to empowering poor people. In addition, there is evidence that social transfers can contribute to growth and the development of local markets.

DFID (2005: 13) also made the following remarkable observations about the significant role of pensions in households in Mexico and South Africa:

A number of social transfer programs are beginning to provide evidence of sustainable impacts on hunger, indicating their potential to contribute to food security and the achievement of Millennium Development Goals. In Mexico, for example, 70% of households participating in the Progresa program have shown improved nutritional status. Its impact on stunted growth in children has also been impressive, with the growth rate among children aged 12-36 months increasing by one centimeter a child a year.

Similarly, in South Africa, having a recipient of the social pension in a household has been correlated with a three-to-four-centimeter increase in height among children. Social transfers have also brought about significant reductions in income poverty. For example, social pensions have doubled the income of the poorest 5% of the population in Brazil and increased it by 50% in South Africa. In fact, the overall impact of the South African social security system on poverty has been to reduce the 'destitution gap' by 45%.

HelpAge International (2006: 2) asserts:

Older people are often disproportionately affected by poverty. 100 million older people are living on less than one dollar a day and older people are disproportionately at risk of chronic poverty with older people in multigenerational households among the poorest. In many African countries affected by HIV/AIDS, households composed of older people and children are particularly vulnerable to poverty.

The main reason why older people suffer most from lack of resources or the depletion of assets is that older people have no regular income. In developing countries, the majority of older women and men work in the informal sectors where there are no pension schemes (HelpAge International 2006: 1).

The arguments about rural assets, pensions and remittances become more pronounced against the background of disadvantaged households with no diverse asset base or no assets at all. Hence, DFID's (2005: 1) observation that money transfers are usually intended for "vulnerable households and individuals", are "still an underutilized option in many places" and that they come with the challenge of cost to most governments. Most scholars agree that developed nations offer more pension funds than developing nations because of challenges in cost. Kakwani et al (2006: 2) state, for example, "the current pension system in Kenya is very limited, with only about 3% of the elderly reporting the receipt of any pension scheme". They state that governments that engage in such projects on nationwide or large-scale basis are likely to meet very high disbursements that are a challenge in their economies. DFID (2005: 21) states that in the case of South Africa "pension which costs around 1.4% of GDP (Gross Domestic Product) is increasingly regarded as unsustainable by some observers".

2.5 Challenges faced by households in the utilization of natural resources

Rural households face several challenges in relation to accessing and using natural resources. The main challenges are discussed next.

2.5.1 Lack of natural resources

As Mararike (1999) has observed, most rural households in former colonies of Africa have limited resources. This is because colonial policies resulted in the relocation of indigenous people into reserves (Zimbabwe) and homelands/ Bantustans (South Africa) where too many people shared few resources in public property. These areas were mostly fragile/ marginal and therefore had limited resources. Ellis and Allison (2004: ii) state that with limited resources households face difficulties in “obtaining food, accumulating other assets, and recuperating after natural-shocks or misfortunes”. This together with other factors such as gender differences and age limitations reduce the households’ (especially among women and children) access to resources. Lack of other social, financial and human capital also weakens the position of households because it may mean that they lack the implements and transportation that aid their collection of resources. Odoki et al (2001: 602) provide a summary of some of the constraints which exacerbates the challenges faced by households that hinder them from accessing resources:

- Temporal constraints: that determine when and how long an individual must join other individuals (or objects) in order to participate in production, consumption, social and other miscellaneous activities. Generally, temporal constraints are a subset of coupling constraints (see below).
- Spatial constraints: that determine the availability of activities within geographical areas and the locations of specific activities in which individuals participate.
- Economic, social and cultural constraints: that determine who has or has no access to specific resources at specific times as a result of cultural rules, laws, income levels, gender and social relationships.
- Coupling constraints: that fixes individuals at a point in space for a period of time.

- Transportation constraints: that circumscribe behavior by limiting the distances and individual can travel within a particular time span using the available transportation system (mode, routing, timing, cost, etc.).

Odoki et al (2001: 603) point out that limited access creates a poverty trap to those without livelihood alternatives (lack of extra income). Barrios (2008: 1), supports this opinion and states that there is a strong correlation between rural poverty and resource inaccessibility. They suggest that governing bodies should adopt development policies and strategies aimed at improving accessibility. In addition, Barrios (2008: 1) points out that this will automatically remove the isolation of households from places and opportunities they want to utilize in order to achieve sustainable livelihoods. If households remain in these fragile zones the probability of being vulnerable is great.

2.5.2 Vulnerability

Baumann (2002: 3) defines vulnerability as:

...the external environments in which people pursue their livelihoods and their exposure (risk) to the negative effects of the external environment, as well as their resilience in resisting and recovering from external shocks and trends.

Chambers (2006: 33) adds to this definition when he states that vulnerable households are those “left defenseless, or in a state of weakness, exposure and susceptibility to environmental conditions which can best described as a state of poverty”. Such households undergo economic hardships, insecurity, humiliation as well as even mental trauma not to mention, sheer physical weakness itself (Human Development Report, 2007/2008). Chambers (2006: 33) identifies two categories of vulnerability: the external side of risks, shocks and stress to which an individual or household is subjected to; and on the internal side, which households experience “lack of means to cope” with loss of what can best be described as the source of their livelihood. On the other hand, Odufuwa (2010) argues that vulnerability can be age sensitive and bring in a lot of insecurity to the affected. There is therefore a strong co-relation between availability of assets

and vulnerability since vulnerability is in most cases a result of insecurity in assets and vice-versa. Such a strong co-relation requires addressing both availability and vulnerability if households are to be rescued from exposure to poverty.

Heltberg et al (2008) indicate that the social position of a household determines their sensitivity to risk, their exposure, their adaptive abilities as well as their risk coping and resilience. They stress that poor communities often suffer from heavy insecurities because they are always ill equipped to deal with these shocks related to their livelihoods. In the parts of SSA where there is instability in the natural resource base of rural areas, households are exposed to perpetual drought spells that lead to crop failures, deaths of livestock, disease, pests starvation and famine (Sims and Kienzle 2006). In these conditions, households face major limitations such as lack of water for use at home and for agricultural purposes. Prolonged drought spells also mean extensive deforestation and overgrazing, limiting the pasture capacity for most lands. Sims and Kienzle (2006: xi) give an example of one of the common stresses households face - the issue of washing away of precious soil needed for crop cultivation. The consequence of this is that productivity is low and also the labor force is spread thin as the household tries to secure food for both people and domesticated animals.

Burkina Faso, for example, a country of very high population density and very scant natural resources and fragile ferralitic soils with little ability to hold water, is described as one of the African nations with high vulnerability rates, especially because 90% of its population is agricultural (Kaboré and Reij, 2004: 15). They also assert that because of limited transportation in most of its remote areas, vulnerability levels are exacerbated because households are not well connected to other places where food can be imported if at all households can afford it.

Regarding Southern Africa, Reid and Vogel (2006) identify some of these stressors to be climate, diseases, tenure insecurity; poor agricultural extension and poor governance. These scholars also emphasize that not only do households face these threats but also deal with the inappropriateness of responses to the threats they face as well as poor adaptation strategies and options. They point out that in most cases, while these stressors affect individual households at different scales

relating to food insecurity, they also cause major challenges to rural development in general. They observed that these stressors are also often related and tend to interact with one another to produce complex stressors for households, that is, other situations that heighten or aggravate stress levels and complicate the ability of households to cope.

Holmberg (2008: 25) also identifies fires as a major threat to nature in some African communities. He states that these fires date back to the time of shifting cultivation where indigenous farmers fired the land to clear it for cultivation. Even up to today, this practice is still noticeable among some of Africa's sedentary farmers. He states that effects of these fires are seen in the charred vegetation that can be readily seen in rural areas in most SSA countries after the harvest season. He also indicates that it is evident that more sedentary farming practices would contribute to a reduction in deforestation but fires, however, bring more damage to biodiversity as they burn up even untargeted species including wildlife, especially when they encroach into the nearby forest resources.

2.5.3 Climate change and global warming

One of Africa's major household stressor is climate change. While this is a major global phenomenon, responses to such major stress, differs between any two regions (Narayan, 1999: 22). According to the GEF report (2011: 3), African households numbering up to more than 250 million face livelihood challenges that are being compounded by the current climate variability of the continent:

...decline of Africa's natural systems such as the Sahel, the Lake Chad Basin, and the Congo Basin has tremendous repercussions for future generations. Worryingly, the depletion of natural resources —*land, water, and forests* further exacerbates the declining trends in crop and livestock productivity, and these trends are intimately associated with increasing food insecurity and health risks.

Holmberg (2008: 36) points out that SSA is already under pressure as a result of “desertification and land degradation, deforestation, increasing water scarcity and stagnating crop yields” and the increase in population will only exacerbate and compound the catastrophes associated with land

shortage that not only affect rural areas but also urban areas through migration. Holmberg (2008: 36) states that, according to a report provided by Intergovernmental Panel on Climate Change, released in February 2007 through Nordic Africa Institute:

... by 2020, a projected 75–250 million people in Africa will be exposed to increased water stress due to climate change, with agricultural production severely compromised, local food supplies negatively affected and, towards the end of the 21st century, low-lying coastal areas threatened by rising sea levels. Climate change may also impact on security, cause increasingly severe natural disasters and lead to increased out-migration from affected regions. More attention will need to be devoted to eliminating impediments to economic growth if vulnerabilities to climate change are to be addressed.

Furthermore, Holmberg (2008: 11) observes that climate change will bring about untold water stress as there will be great reduction in annual river run-off and water availability is projected to decrease by 10–30% in dry regions at mid-latitudes and in the dry tropics, some of which are presently water stressed areas”. While this report gives a picture of doom, especially to the defenseless rural households whose hands are tied due to lack of a wide asset base, Holmberg (2008: 8) pins hope in the use of adaptation measures in all sustainable development strategies”. Some of the suggestions he makes include better forecasting and early warning systems, education and awareness creation, capacity building and good governance.

Due to inadequate food supplies, lack of clean water as well as poor sanitary conditions, Holmberg (2008) argues that the prevalence of malnutrition is unquestionable and mortality rates are heightened and life expectancy lowered, especially in children. To this he also adds that as a result of ill health in animals, there are drastic reductions in dairy and beef supplies. For most rural households, these are the only supplies of protein they know of.

Additionally, climate change impacts natural resources for households that are in coastal zones. These are usually rich and endowed in a wide variety of biodiversity. South Africa is typical of coastal regions that have great biodiversity (Holmberg 2008: 14). Although most are under protection, which helps to preserve the rare flora and fauna, these areas are alienated from the communities they are supposed to serve. This exemplifies the gap between government policies and rural household needs which oftentimes are at the bottom of the pile in the social, political

and economic priority list. Holmberg (2008: 14) also notes that climate change also triggers species migration and leads to further habitat reduction. All these stressors compound the life of households and make it hard to be able to sustain themselves adequately.

2.5.4 Tragedy of the commons

Another risk factor that threatens the sustainability of the livelihoods of rural households is overuse of natural resources, which results in the degradation of those resources. Garrett Hardin in 1968, used the concept of “tragedy of the commons” as an allegory that aptly describes the problems of overuse and degradation of natural resources including the destruction of fisheries, the overharvesting of timber, and the degradation of water resources by resource users (Ostrom 1999: 193). The concept refers to a situation in a group of people caught up in a common predicament are “trapped in an inexorable process from which they cannot extract themselves” (Ostrom, 1999: 193). It is with this understanding in mind that Cousins (1999) argues that sometimes the value of a natural resource may go unnoticed such that it may fall under plunder as common property by the very people who use it. Concerning agricultural economies of rural Africa, Cousins (1999: 300) reminds us that the majority of household assets are in form of common or public property because a lot of them struggle to make ends meet, they therefore overharvest the resources available to them making the land subject to the tragedy of the commons.

In reference to the impact these approaches have had on communal households of Buhera district of Zimbabwe, Mararike (1999: 9) states that mainstream western economic development approaches with a pre-conceived notion that the local people have a “diminished capacity...to take care of themselves” and as a result need help from outside, has had very minimal success. Consequently, some scholars whose research focuses on rural development have proposed more sustainable community-based strategies that empower households to not only have access to natural resources, but to also participate in the management of their own natural resources (Mararike, 1999).

In addition, Cardenas (2004) points out that every rural developer needs to note that not all stakeholders of an ecosystem have power to determine the extraction of resources in time and space. This is so because some stakeholders (who may be urban dwellers) do not necessarily dwell in the regions where these ecosystems serve them, so the resident dwellers have more impact to their shared resources, which is common property (Narayan, 1999). Hence environmental protection is critical to such property as it is the only way all stakeholders will alternatively curtail vulnerability caused by shocks detrimental to livelihoods (Reid and Vogel, 2006).

2.5.5 Impact of HIV and AIDS

Shinn and Lynne (2005: 159) note that one of the challenges faced by rural South Africa (which consequently contributes to poor quality human capital) are low levels of health. Barany et al (2004) highlight that the impacts of HIV/AIDS in particular extends SSA more generally. This is a result of high poverty levels which expose households to suffering through lack of adequate food as well as good health care (Rakodi 1999). There are many ways in which the impact is felt. It robs development of the much needed labor force as it is diverted to taking care of the sick. Shinn and Lynne (2005), Rakodi (1999) and Mutangadura (2001) suggest that care for the sick is generally designated as a woman's job, both young and older women. These women already involved with child bearing, suffer physical and psychological effects of this burden not forgetting that they are responsible for household chores like drawing water from wells that are very far away, collecting firewood from distant plains and the actual cooking of meals (Mutangadura 2001). Adding low levels of health to environmental degradation diminishes more the capacity of rural households to sustain their livelihoods. Rahman (2004: 2) states that environmental degradation is largely responsible for what he describes as "diverting labor" which results in reduced labor productivity in a given area. He points out that whether the household members are healthy or not (Rahman, 2004: 2):

...as fuelwood becomes scarce, poor households must spend an increasing amount of time collecting it. Time taken away from other productive activities like agriculture has an opportunity cost for the poor and can result in their lower incomes. Further, families are not able to compensate for this diversion of labor resulting in a reduction in

household income from agriculture and deterioration in food consumption levels and nutritional status.

Such environmental concerns have notably been exacerbated by increased exposure to frequent drought spells, one of the consequences of the fast encroaching phenomenon of global warming (Narayan, 1999). In between daily chores, women also tend to the fields and sometimes tend to smaller livestock around the home leaving very little time to rest. Bearing in mind that the food resources are already limited, it speeds up fatigue and pre-mature aging rendering the quality of the human asset weary and weak, with a reduced productive capacity (Mararike, 1999). As reported on the United Nations News Center website on November 30, 2002, Kofi Annan, the Secretary-General of the United Nations (2002) sympathized with the plight of African women, whom he referred to as “keepers of African societies, whose work makes up the economic foundation of rural communities”:

... today, as AIDS is eroding the health of Africa’s women, it is eroding the skills, experience and networks that keep their families and communities going. Even before falling ill, a woman will often have to care for a sick husband, thereby reducing the time she can devote to planting, harvesting and marketing crops. When her husband dies, she is often deprived of credit, distribution networks or land rights. When she dies, the household will risk collapsing completely, leaving children to fend for themselves. The older ones, especially girls, will be taken out of school to work in the home or the farm. These girls, deprived of education and opportunities, will be even less able to protect themselves against AIDS. If we want to save Africa from two catastrophes, (HIV/AIDS and famine) we would do well to focus on saving Africa’s women.

The general trend therefore is that the poorer the household, the more vulnerable they are to this phenomenon since the household would not also be able to afford medical attention (in most poor communities). On the other hand, the better-off the households (especially those that supplement on-farm income with off-farm income), the better are their chances of sustaining good health and their livelihood because of their ability to afford medical bills and to have hired labor. After observing rural households in Kenya, Freeman et al (2004: 164) noted that non-farm incomes accrued as a result of off-farm activities (mostly done by men) enabled:

...households to hire labor in order to undertake timely cultivation practices, and helps to fund the purchase of farm cash inputs; conversely, hiring out labor by poor households causes their own farm productivity to stagnate or fall.

This illustrates the trap the poor households find themselves in. There is a delicate relationship between keeping themselves healthy, working on their farms for substantial produce, or hiring out their own labor while their own production and health fails (Rahman 2004). If they stay with their farm activities, production is mostly going to be too low to sustain the family anyway throughout the whole year. Rahman (2004: 3) observed that most households at the "risk of falling below the subsistence levels of consumption, treat available natural resources as an asset to be drawn down in times of emergency". This creates more uncertainties and hardships that torment rural households and women in particular.

The HIV/AIDS pandemic, which has caused massive deaths in most communities, has been classified in most studies as a strong hindrance or drawback to the availability of quality human assets in most households (Mararike, 1999). Shinn and Lyne (2005: 159) point out that the HIV/AIDS pandemic is exacerbating the already ~~high~~ levels of morbidity and infant mortality....often as a result of poor nutrition and inadequate health care".

Aliber (2003: 482) observes, ~~h~~households with one or more members suffering from AIDS may endure the impoverishing effects of the disease well beyond the deaths of those members". This is because they sell even their major assets in desperation to pay for healthcare. By the time most AIDS patients die, the family assets would have been depleted (Mararike, 1999). Research shows that deaths bring untold emotional suffering during and post-care of the victims of AIDS. The survivors become victims because they are robbed of their ability to function to their full capacity. Aliber (2003: 476) concludes that the victims usually become embedded in chronic poverty which he defines as ~~p~~overty that is transmitted from one generation to the next since children from poor households are likely to become poor adults, whose children will in turn risk remaining in poverty, and so on". Therefore, human assets are at great risk in most households and its quality under great threat due to the impact of HIV/AIDS. It has become an epidemic

hampering both household and national economies (Drimie, 2002). Mano et al (2003: 18) sum up the effects of HIV/AIDS, especially combined with other diseases on households:

- it impacts on food security at the household level;
- it depletes the human capital, agricultural production and productivity;
- it withdraws financial resources from economic activities in favor of health and funeral expenditures;
- it makes it financially impossible for agricultural households to intensify production through the use of labor saving and capital intensive technologies;
- it reduces the ability for poor households to generate their usual income from casual labor;
- it restricts the access by households to economic services such as credit;
- it may disrupt customary exchange of labor for farming activities; and
- it reduces food security of households which adopt orphans.

Mano et al's (2003) foregoing argument on the interconnections between the availability of natural resources and good health and sustainable livelihoods for rural households has been demonstrated by the destruction of humans' capability, in particular the present impact on children (no education and development of families headed by children) which is hampering quite significantly the sustainability of knowledge transmission and countries' capacity to reduce poverty.

2.5.6 Natural resource conflicts

Studies on causes of armed conflict in Africa have established strong connections between natural resources extraction and the commencement, increase as well as persistence of violent conflict. According to the United Nations (2006: 7):

Natural resources have been shown to play a key role in the conflicts that have plagued a number of African countries over the last years, both motivating and fuelling armed conflicts. Revenues from the exploitation of natural resources are not only used for sustaining armies but also for personal enrichment and building political support. As a result, they can become obstacles to leaders of armed groups involved in exploitation are unwilling to give up control over these resources. Even when conflict gives way to a

fragile peace, control over natural resources and their revenues often stays in the hands of a small elite and is not used for broader development of the country.

Wars over resources end up destroying the very resources that are supposed to sustain people's lives. Cousins (2006: 2) describes it as a 'curse' or a 'peace liability', fuelling violent conflicts over access to, and control of natural resource wealth.

Referring to natural resource use in pastoralism, (the keeping of livestock on a large-scale) Kimani (2008) notes that there was a prevalence of resource conflicts among different groups of pastoralists in the Greater Horn of Africa. This part of Africa is heavily affected by frequent natural disasters therefore migrating pastoralists compete heavily for the use of key (and yet sparse and unreliable poor quality) resources, namely water and pasture. This whole region, with a few exceptions of naturally occurring water holes, is characterized by relentless harsh weather, scarce rainfall and poor soils. As Kimani (2008: 3) explains, such "a close relationship between these key resources and the survival of the communities means that the pastoralists will usually employ any means available to them, including violence, to seek and claim control of the resources". In fact, Kimani (2008: 3) points out that these conflicts have become so very "violent, indiscriminate, destructive" and extremely complex especially that they are tied up into socio-economic and political agendas of the pastoralists making it very challenging even for the government to come up with sustainable resolutions.

2.5.7 Gender and natural resource access

The concept of gender refers to relations of power between men and women (Aggarwal, 2001). Moagi (2008: 213) defines it as "culturally prescribed social roles and identities of men and women within a society". In many African cultures, traditional roles put men in positions of strength and influence due to culturally accepted male patriarchy. There is strong loyalty to these traditional roles even by women who perceive themselves to be marginalized by these practices.

Freedman (2001) states the term gender emerged due to the rise of the feminist movement in the twenty first century whose main agenda was to increase opportunities for women in politics and

public life. This issue has prompted the critical examination of natural resource allocation, access and use by rural households along gender lines. Research has revealed that there is indeed a strong influence of one's gender in the choices of livelihood strategies adopted as well as access to and control over a range of resources, including land as indicated by Thamaga-Chitja et al (2010). Moagi (2008) reports that this can be noticed by the marginalization of most rural women who lack ownership to land and other resources needed for survival. Moagi (2008: 215) suggests that this is so because of the perception that "women get married and leave their parents (land) to live with their husbands being introduced into the new family". Moagi (2008: 215) further points out that due to their low socio-economic status brought about by poverty and illiteracy, these women are greatly challenged by "bureaucratic procedures that are necessary to gain access to title deeds, or fight for their rights to land in court". Concerning common pool resources Rao (2005), notes that current development projects and procedures that affect rural households put effort in evaluating opportunities and capabilities of each gender group to access assets.

Rao (2005) has observed that female-headed households are generally poorer than male-headed ones and also points out that when examining women, a clear distinction must be made between women under male heads (wives) and women who are heads of families because their circumstances are not going to be the same. Rao (2005) points out that while both groups have a low status in decision-making processes compared to men, the predicament of the women that head families is worse off. Wikam (2004) says that there is a lot of information on who the poor are in Botswana: they are mainly female-headed households among others such as the elderly, the uneducated, and those who dwell in remote areas. Shinns and Lynne (2005: 159) have argued that comparatively many men, even those who are unskilled, have more physical strength than women. This allows them to engage in tougher jobs that put them in a position to be able to do a better job extracting, processing and transporting natural resources. Moore (2007: 1) provides some evidence to show how disadvantaged women are:

- Women own less than 1% of the African continent's landmass.

- Women farmers receive only 1% of total credit to agriculture, and have fewer economic rights and lower access to economic opportunities, including land and credit facilities.
- An African woman's average workday lasts 50% longer than that of a man and she shoulders the burden of unpaid activities, often linked to low access to clean water and energy sources.
- Only 51% of females over age 15 years in Africa are able to read and write compared to 67% of males.
- Three-quarters of all Africans between the ages of 15 and 24 years who are HIV-positive are women.
- A pregnant woman in Africa is 180 times more likely to die of pregnancy complications than in Western Europe.
- Limited education and employment opportunities for women in Africa reduce annual per capita growth by 0.8%. Had this growth taken place, Africa's economies would have doubled over the past 30 years.

These hindrances take away from the potential women have to participate in life changing and rewarding activities. The World Bank (2005) report states that Burkina Faso, with an evident inequitable distribution of land between its male and female-headed households, is said to be able to increase its farm output from a low level of 6% to 20% with just the re-organization of its land using revised agricultural policies that allow for a fair distribution of resources between males and females. If such a strategy is adopted, perhaps many communities (with the help of donors that purport to support gender awareness) would also realize an increase in agricultural outcomes from women with an improved natural resource base. Rao (2003: 181) points out that "women's improved access to land need not signify gender equality, but instead may point to a shift in the valuation of land and agriculture as livelihood resources and activities" that are good for all.

2.5.8 Gender violence

In their study of South African rural communities, Kim and Motsei (2002: 1243) found out that gender-based violence is prevalent especially against women in resource poor regions. They state that women are traumatized through this violence inflicted upon them by their intimate partners or husbands. In view of gender and division of labor in most rural communities, women are relegated to farm work alongside with child bearing/ rearing, conjugal duties, household chores, travelling long distances for water and firewood, together with the stress of abuse, has great impact on women-environmental relations. It follows from Kim and Motsei's (2002) research that it becomes a challenge to harness resources in the face of ongoing abuse.

Although there is also evidence of abuse of men by women (Kim and Motsei, 2002), there is relatively more evidence that women suffer more and their poor health (coupled with the high levels of HIV/AIDS) and time spent seeking help in clinics is time and strength taken away from accumulating and accessing whatever natural resources are available in their environments. It also causes more hardships in the family that is really dependent on the land for a living because of limited size asset portfolios. Consequently, such challenges force households to over-consume the resources near their dwellings so degradation of the land becomes prevalent and such degradation continues to encroach into the forest land until large territories are taken over by degradation. Furthermore, as Kim and Motsei (2002: 1244) have argued, violence and abuse of women, therefore, has a "direct correlation with the depletion of natural resources". Scholars point out therefore the need for strategic measures to manage resources sustainably which is discussed next.

2.6 Natural resource management

It has been established in the earlier part of this chapter that livelihoods depend on natural resources; that these resources are not equitably distributed especially in developing nations of SSA; and that increase in population as well as poverty is exerting unwarranted stress on the environment (Katerere et al, 2001). It has also been established that the majority of natural resources are subjected to numerous uses by many users and stakeholders to an extent that their

management is not only imperative but has also given rise to governance issues in most nations (World Bank, 2005). Even though this is the case, natural resource management remains central and pertinent not only to rural households who directly depend on them, but also to nations whose overall development process includes processes that are taking place in these small communities too.

With reference to Southern Africa, Katerere et al (2001: 4) state, “national governments in the region have struggled with management of natural resources within their borders, but many now have effective policy and legal frameworks”. However, these scholars draw attention to the fact that single government intervention by itself is not enough. A lot still needs to be done because natural resources overlap from one nation to the other. They also cross borders (Katerere et al, 2001: 4):

Major rivers form the boundaries between several SADC countries, and numerous valuable wildlife populations migrate across borders. Activities in one country often have effects on neighboring countries, and in an era of increasing resource depletion and scarcity, the need for collaboration in management of these resources is growing.

In this set-up, management concerns need to go beyond and across borders. There is a widening range of the stakeholders. Katerere et al (2001) cite the example of the Zambezi River whose river basin cuts across eight of the SADC nations bringing into commonality various forms of biodiversity and shared uses of water. As such, they speak of trans-boundary resources as commonalities that are not immune to the phenomenon of the tragedy of the commons. They also point out that there is an evolving concept of ‘globalization of the commons’, that functions in the same way as the ‘tragedy of the commons’. Its advocacy speaks to the need for cooperate global action against trans-boundary environmental challenges which are causing “uncontrolled deforestation, reduced habitats for wildlife, threatened biodiversity, increasing pollution of the air and water and climate change due to greenhouse gas emissions that require global action” (Katerere et al, 2001: 7). According to Mohamed-Katerere (2001), this concern has mobilized nations through its academia, environmental champions and vanguards, donors and any interested parties to collectively fight against natural resource depletion and paralysis of environments. Hence, the need for holistic approaches to trans-boundary natural resource

management (TBNRM) and community-based natural resource management (CBNRM) that involves the collaboration of NGOs, corporate companies as well as donors and other well wishers (Katerere et al, 2001). According to Nhantumbo et al (2003: 3), Southern Africa is experiencing great strides in developing partnerships in Namibia and Botswana through the efforts of Communal Areas Management Program for Indigenous Resources (CAMPFIRE) which is CBNRM oriented. Concerning riverine environmental management issues in Africa as a whole, Holmberg (2008) concurs with Katerere et al (2001) that Africa's basins are shared among multiple nations and that Africa alone houses about one third of the total global water basins.

According to Holmberg (2008: 19), some of the management issues stem from and are spiked by the absence of cooperation contracts which form the basis of all "sustainable management and equitable sharing of resources among riparian states", lack of necessary technical information and cross border data collection difficulties. As a result, it has generally been observed, that "multi-country efforts for integrated development of trans-boundary water basins are limited to a relatively small number of basins and aquifers" (Holmberg, 2008: 19).

Mohamed-Katerere (2001) argues for the participation of rural households in management of their own resources. She provides four reasons why it is important to involve rural households in the management of their own resources. These include: it allows for the retention and distribution of benefits of local activities within the community and hence provide new opportunities for development; it provides the local populations who bear the cost of natural resource management with the opportunity to make decisions, rather than leave them in the hands of outsiders or unaccountable locals; it reduces administrative and management transaction costs via the proximity of local participants; and it uses local knowledge, values and aspirations in project design, implementation, management and evaluation.

Such an approach results in effective stakeholder participation with special attention being given to perceptions and needs, especially of the low-income rural dwellers. To facilitate households'

involvement with government agencies in environmental management projects, Mohamed-Katerere (2001: 114) suggests:

A number of indigenous or local people's rights can be extrapolated from international agreements. These include rights to control traditional resources, development, self-determination, environmental integrity, intellectual property, cultural property and folklore, protection of cultural heritage, recognition of customary law and practice, community empowerment and respect for and recognition of their knowledge and environmental ethic.

Mararike (1999: 3) argues for the use of local knowledge. He explains that households of Zimbabwe's Buhera district, indeed, have "relevant and appropriate knowledge" about their environment that is very useful towards conservation of ecosystems. He believes that such indigenous knowledge inherent in the local communities is rich in conservation and survival strategies based on being aware of weather and climate patterns, river regimes, feeding and migratory patterns of animals, knowledge of plants and herbs and their perma-cultural significances, harnessing symbiotic relations for the benefit of soil enrichment, livestock survival and overall maintenance of ecological health. Holmberg (2008: 31) concurs with Mararike on the idea that "rural poor have proved themselves to be efficient guardians of the environment".

In conclusion, Mohamed-Katerere (2001) indicates that current trends in environmental movements and conventions are gradually beginning to place these indigenous knowledge systems and customary structures as part of the central discussion in participatory approaches to resource management.

The preceding discussion suggests that efforts to redress the problem of small natural resource asset portfolios should, of necessity, apply management strategies that will bring about improvement in livelihoods. Most importantly, such strategies should involve all stakeholders. IFAD (2010: 1) calls for the development of "technologies and management schemes that can enhance productivity" and for the discovery of ways that "preserve the natural resource base".

Reid and Vogel (2006: 203) also suggest an overall approach of rebuilding the asset base of households:

...to possibly guide future interventions to reduce vulnerability include asset building, improved institutional capacity and better understanding of social relations and the role of social capital in the area. Access to assets and a 'stock' of existing capabilities and improved understanding of situational vulnerabilities are essential when trying to enhance resilience to a range of environmental risks.

Agroforestry provides a useful example to examine land management strategies. Because of limited natural resources, households maximize the use of the land they have. Agro-forestry is one such agricultural system that is also regarded as an effective land management system of cultivation in many parts of Africa. Motis (2007: 1) defines agro-forestry as:

...the production of trees and of non-tree crops or animals on the same piece of land. The crops can be grown together at the same time, can be grown in rotation, or can even be grown in separate plots when materials from one are used to benefit another.

Steppler and Nair (1987: 4) state that ever since the inception of what is now termed agro-forestry, "trees were an integral part of a farming system". Their main role was to support agriculture through symbiotic relationships of the fauna and flora so that high yields would be realized and food security achieved. Other roles included "holding the soil against erosion and improving soil fertility (by fixing nitrogen or bringing minerals from deep in the soil and depositing them by leaf-fall)" (Steppler and Nair, 1987: 4). According to Motis (2007: 2), trees also provide "construction materials, food for humans and animals, fuels, fibers, and shade". Overall, the agro-forestry was crucial for the maintenance of "long-term soil health of poor or average quality lowland soils" (Motis, 2007: 35).

Rakodi (1999: 318) emphasizes that the definite desire and aim of each household is to have a "livelihood which has high resilience and low sensitivity to shocks and stress". She states that when faced with shocks and stress, the affected households come up with management strategies. These are called coping strategies that would help them to survive. Dixon and Gulliver

(2001) presents some of these examples which are for long-term purposes that households can adopt including:

- Intensification of production;
- Diversification of agricultural activities for increased output value;
- Increased farm size;
- Expansion in off-farm income; and
- Complete exit or departure from the farming system.

In conclusion, Dixon and Gulliver (2001) believe that most likely by 2030 most of the world's population will be living in urban areas due to the rapid urbanization throughout the globe. He states that even though this may be the case, there will still be large populations worldwide who will still be depended on farming for their livelihood. To resolve this situation, Dixon and Gulliver (2001: 21) propose that at the micro level each community should adopt coping strategies that address challenges they face daily, while at the macro level policy issues and the resultant investment priorities by the government/ NGOs ~~must~~ take into account the immense diversity of opportunities and problems small farmers face" (Dixon and Gulliver, 2001: 21). He adds that it is also crucial for policy-makers to realize that households have limited control over the environment they find themselves in, from which they acquire their resources for a living and also make choices on what activities to embark on. This is why GEF (2011: 1) states that it is important for African leaders to recognize the crucial need to address vulnerability as a development priority.

2.7 Policies that address natural resource asset distribution

This section reviews literature that focuses on policies that have had an impact on the distribution of and access to natural resources among households. Such literature is crucial to the understanding of policies that have affected this research focus on KwaDube in KwaZulu-Natal. Because the area under study was once colonized, studying case studies of similar experience clarifies policy impacts on the livelihoods of households in terms of the availability and distribution of assets. Most scholars who address such policies take a comparative approach,

specifically dealing with three distinct historical eras: pre-colonial, colonial and post-colonial. They bring out the different impacts each era had on asset distribution as determined by policies put in place.

2.7.1 Pre-colonial period

Drawing largely from case studies in Africa, decades of academic critical assessments of communities there indicate that nations that later on came under colonial rule were once organized differently then, than during and after colonialism (Amanor, 2004). Such academic work broadly mentions the existence of organized communities that lived freely on the land in homesteads or villages made up of clans or communities that were able to have both private and public assets. Amanor (2006) states that although there was fierce competition among these communities for resource ownership that often led to wars and tribute paying, most communities, however, were able to have access to resources in their own territories. Research shows that rules that governed resource allocation and use were mostly verbal agreements among communities under the headship of kings and chiefs. Scholars like Amanor (2004) point out that the main purpose for the resources was for consumption more than it was for trade since most communities were not yet too materialistic like in this historical time. They also, however, indicate the gradual growth of trade among the indigenous people and the incoming foreign traders even before settling as colonists (Amanor, 2004).

Although this does not completely rule out trade in some natural resource assets that belonged to people's environments, population figures were still very low such that vast lands were available to provide the much-needed resources for households. Because poor households are mostly found in formerly colonized nations, Hall (2009) states that even though these nations are now independent, there has sadly been, either a carryover of the same policies that relate to the distribution and management of as well as accessibility of natural resources or a very slow process of redressing the land issues. She states that in South Africa:

For years, the process has been variously described as being in crisis, at a crossroads, at an impasse or simply 'stuck'. This still seems as true as ever, as political pressure is

mounting to find new solutions to old problems. In recent years, the issue of 'delivery', and how to speed it up, has taken center stage and become a justificatory framework for arguments about how to reconfigure roles of the state and private sector in land reform.

2.7.2 Colonial period

With the advent of colonialism by imperial powers such as Britain, France, Germany, Portugal, Spain and many other European nations, control was put on the use of resources much of which was to the disadvantage of the rural poor. Thus, Amanor (2004) points out the alienation of rural communities from their own resources, which evidently were extracted to feed industrial regions in the cities. He briefly explains that "core-periphery relationships between the urban areas (core) and the rural areas (periphery)" and states that rural areas are seen as places necessary for the extraction of natural resources needed in the industries located in the cores (city) (Amanor (2004).

According to Mararike (1999), colonial governments imposed policies over subjugated people. These top-down impositions did not all cater for the livelihoods of communities. Scholars also show that most communities lost their main source of livelihood, which is land through dispossession. The act of dispossessing African communities of their land changed the asset base of households since they had to move to new territories, which they may not have been very familiar with. Mararike (1999: 70) further points out how, before colonial dispensation, African communities were culturally and economically in full control of their natural world resulting in an integrated rhythm of life. Additionally, he explains the traumatic impact suffered by these communities because of the re-organization of their natural resources. Such was the case in Southern Africa caused by the creation of Bantustans, Reserves and tribal trust lands in former Southern and Northern Rhodesia and Nyasaland, now Zimbabwe, Zambia and Malawi.

Amanor (2004) is one of the scholars who have paid special attention to changes in resource accessibility by rural communities in parts of West Africa. He adopted a comparative approach to the study of household natural resources. He begins by analyzing the availability and distribution of resources in pre-colonial times. He follows this with an analysis of how

colonialism re-mapped the colonized areas and therefore drastically changed the availability and distribution of natural resources in these areas. He concludes his discussion by focusing on how the present governments are redressing this situation.

Amanor (2004: 8) further notes that West Africa's forest management, to date (also prevalent elsewhere in the developing world):

...has been influenced largely by colonial forest policies. These policies were primarily concerned with securing control over land and natural resources for the colonial authorities.

Amanor (2004) also shows that the adopted policies of participatory development do not necessarily widen the natural resource base of the poor households or improve opportunities for them to improve significantly in their resource management and general livelihoods. He observed the participatory forest management introduced in West Africa and realized that whilst the objective was to bring stakeholders together and remove the alienation of grassroots people in the decision-making process, it also opened the communities to the activities of numerous NGOs. These gave rise to competition among development projects. Studies indicate that this has consequences to resource distribution (especially the public endowments/ property) as consequently it leads to the inaccessibility of certain resources.

2.7.3 Post-colonial period

Mararike (1999: 145) suggests that there is and has always been conflict between the needs of households and government policy as well as policy implications between NGOs and the government. An example of this is the introduction of cash cropping to fulfill the needs of the overseas markets at the expense of growing food crops needed by households (Mararike 1999: 145). Mararike's argument here is that cash cropping and the introduction of the money economy, especially in Africa, has had a great impact on the asset base of households in that it allowed households to access (tractors, cultivators) and sometimes to possess technology

(fertilizers, pesticides, hybrid seed) needed to promote growth of crops such as tobacco, cotton and other different types of crops for export that varied from region to region. Thus, the money economy did derive benefits but this often came with a cost in relation to attaining household food security and cash crops replaced subsistence crops.

2.8 Conclusion

This literature review brought up a general consensus among scholars dealing with rural development that natural resources are available in various capacities and are valuable to rural communities, and that the ability of households to access them brings about improved livelihoods. This literature review also reveals that households accumulate, not only natural resources, but also other physical, human, social and financial assets to build portfolios from which they can survive. Evidence has been provided to show that when households have a strong asset base then they can diversify their activities and income such that in times of vulnerability, they are able to cope with shocks and stress. Scholars suggest that these times of shock and stress are an indication of the status of the natural resource asset base of a household as indicated by the variety of, or absence of choices the household has, in-order to cope with the unexpected discomfitures their environment may pose at any time. Scholars see the application of the SLF to the study of the natural resource base portfolios of households as crucial because of its significant role in increasing understanding of the categories of people's livelihoods; connecting assets with the impacts, outcomes and vulnerability solutions; as well as the policy choices that the governments may implement in relation to these relationships.

Researchers have also observed that externalities play a significant role in influencing the natural resource base of the households as well as the resultant pattern of rural development. These external forces include the government and its local administrative arms as well as international agencies and donors whose policies shape not only the activities people engage in but also the zonation of land which determines where and what resources the households can get access to. Relating to the influence of externalities, research has shown that it is through these externalities that most rural households accrue other assets such as physical and financial capital. However,

some of the government initiatives have left households without tenure. Such is the case with numerous developing nations in SSA. Included in this case are women whose socio-cultural status that is diminished by the culturally reinforced male–dominance (not to mention the effects of HIV/AIDS) cannot compete for resource ownership alongside men. The 20th century, however, has seen the rise in advocacy for gender-based development processes that include empowering women to fight for their rights to asset ownership.

Research also reveals that rural households struggling under unpredictable environmental conditions that have led to stress in their ecosystems and depletion of biodiversity, manipulate synergistic relations within ecosystems in-order to exploit the benefits of the natural resources they have for their day to day living. It is through these symbiotic relations based on their indigenous knowledge systems inherent in them that households are able to effectively manage their own natural resources (even prior to colonialism). For the challenges that are beyond their control, households depend on some of the rural development programs their areas offer to find means of livelihoods. Scholars also indicate that nations on a macro scale have to find solutions that are lasting for environmental issues that emanate from a variety of situations, some of which include environ-political struggles; nature versus people struggles; trans-boundary commons and global warming, to mention a few.

Overall, rural development requires stakeholders to put their heads together for the common good. Researchers encourage governments to refrain from policies that overlook the presence and also needs of local households in their development projects and programs. These scholars affirm integrated approaches to development where people are the central focus above everything else and to recognize the dynamic influence migration, remittances, grants and pensions have on the lives of those who have access to them; the disparities that exist in asset endowment as a result of them; and how to address these variations for the sake of the common good. Scholars therefore agree that the 21st century calls for increased vigilance concerning the earth's fragile ecosystems, which carry livelihoods for many.

CHAPTER THREE

BACKGROUND TO STUDY AREA AND METHODOLOGY

3.1 Introduction

This chapter is divided into two sections. The first section provides a general outline of the study area, KwaDube. Main issues covered in this section include the location of KwaDube, its biophysical construct, as well as its demographic and socio-economic structure. This background information is aimed at exposing the naturally occurring resources of the area leading to the understanding of the corresponding effect these have on the quality of livelihoods experienced by households. The second section focuses on the research techniques used to gather information needed to draw conclusions on the natural resource base in the KwaDube community.

3.2 The geography of the study area

3.2.1 Location

KwaDube, the rural community from which the primary data was collected, is in KwaZulu-Natal. It is part of the stretch of land called the Indian Ocean Coastal Belt (IOCB), which occupies the east coastal territories of South Africa. Its physiography depicts two regions; mainly the eastern coastal areas and the western interior hinterland, which is landlocked (South Africa Info. 2012). According to Jacobs et al (2011: 7), KwaDube is “approximately 180 kilometers north of Durban in the uMhlatuze municipal region”. KwaDube is surrounded by places such as the urban and peri-urban areas of Esikhawini to the northeast, Amadaka to the southeast, Ndleleni further up to the north, Gobandlovu to the North West, Uzingwenya to the Southwest and further south, Nkubosa 1 and 2. Along the coastline are the sparsely populated settlements of Empembeni, Ncombo and Ndindima and to the north other commercial land around Felixton, which is intercepted in some instances by urban land. Large tracks of forestland lie between these sparsely populated areas of commercial activity along the coast. Further west are protected state conservation areas including the Ngoya Forest reserve and Fundimvelo Nature reserve. To

the northeast is the Nhlabane Nature reserve. Figures 3.1 and 3.2 below show the location of KwaZulu-Natal in relation to other provinces in South Africa and UMhlatuze Municipal Authority, respectively.

Figure 3.1: Location of KwaZulu-Natal in South Africa

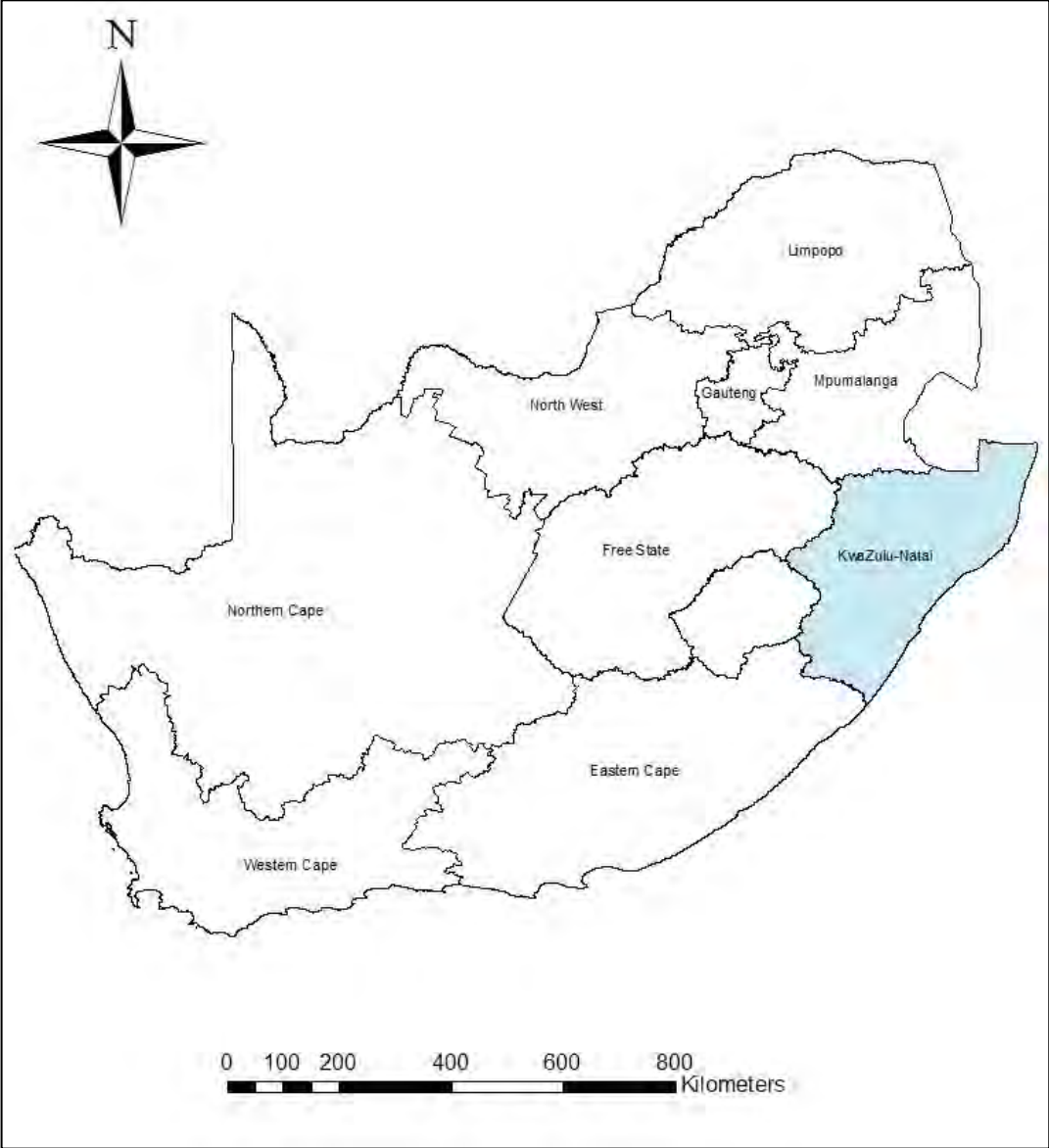
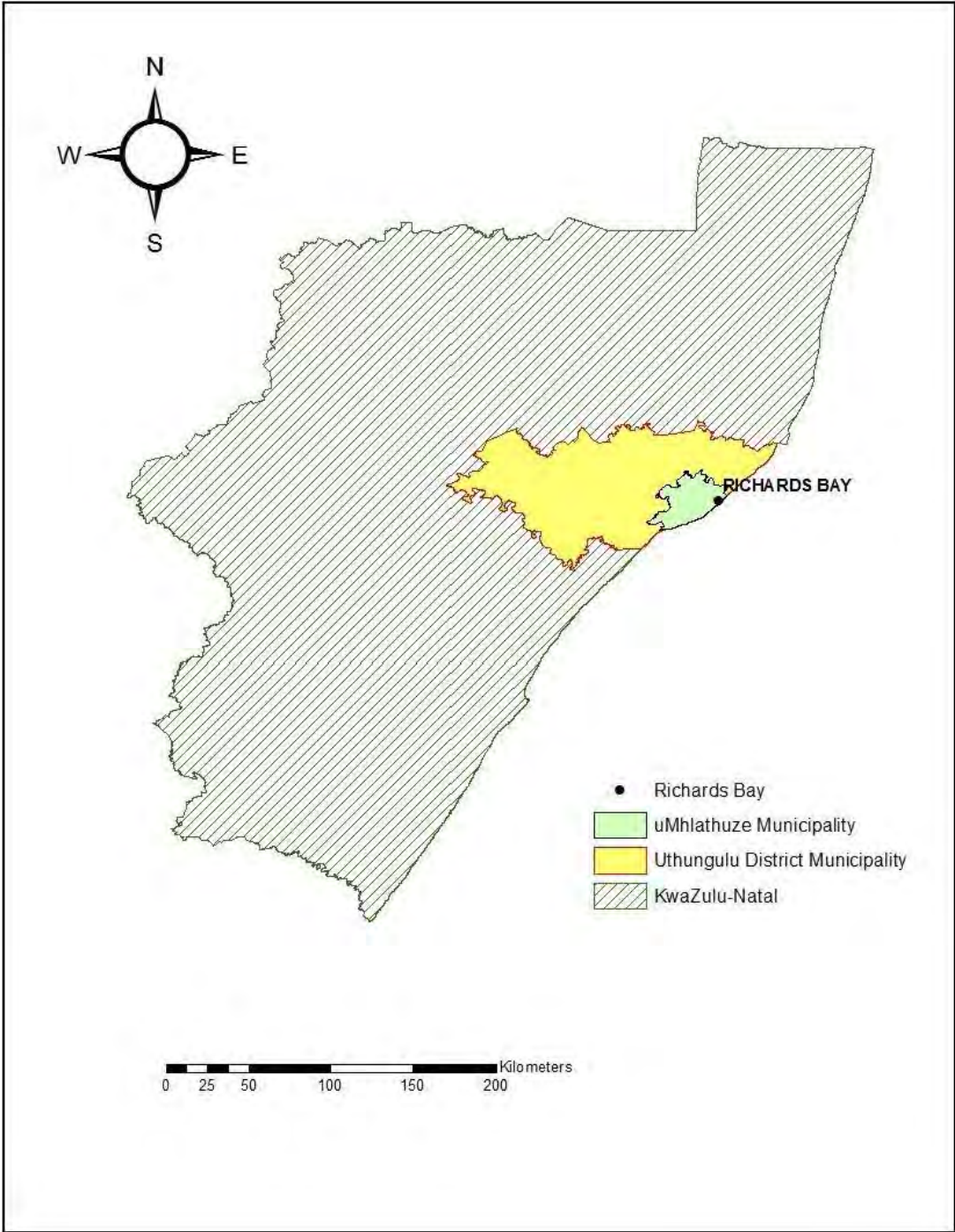


Figure 3.2: uMhlatuze Municipal Authority



3.2.2 Population

The Municipality of uMhlatuze encompasses both urban and non-urban settlements. The non-urban settlements are made up of rural areas under city authority and some under tribal authority (Department of Community Facilitation and Marketing, 2008: 3). Some of the households in KwaDube, however, fall under the uThungulu District Council. As of 2010, this district had a population of 1 025 835 and a racial makeup of 95.7% Black Africans, 0.7% Colored, 1% Indian/ Asian and 2.6% White. Compared to the rest of the South African provinces, the Census 2011 statistics indicate that KwaZulu-Natal is the second most populous province with 10.27 million people after Gauteng with 12.7 million people (SouthAfrica Info., 2012). KwaDube, as of 2001, had 52 239 people. Such high numbers are explained by the existence of an urban population in UMhlatuze where generally there are higher concentrations of people over very small pieces of land.

3.2.3 Climate

KwaDube falls under the Sub-tropical Maritime Climate. This climate is characterized by heavy summer rainfall between January and May, reaching peaks of up to 1 200 mm. This is a result of strong oceanic currents whose heat and moisture is brought on land by the South Easterly Trade winds that originate in the Indian Ocean.

There is a record of rare and disruptive weather phenomena that KwaDube, as part of KwaZulu-Natal, has experienced in the past. This includes drought spells and floods (Reid and Vogel 2006). Outstanding episodes include the 1983 and 1992 to 1994 drought that impacted the greater part of Southern Africa including Zimbabwe. Cyclone Démonia and Mboa also affected not only KwaDube but also Mozambique and parts of Zimbabwe where it weakened after causing massive flooding and destruction of property not to mention upsetting the hydrological set up of the region (UMhlatuze Municipal Area, 2008). Reid and Vogel (2006: 199) state that in 2004 ~~a~~ needs assessment revealed that over 700 000 people” lacked clean drinking water ~~after~~ boreholes, rivers and springs in KwaZulu-Natal dried up”. This unreliability of rainfall points towards climate change. Reid and Vogel (2006: 199) have observed:

...shorter and more intense than was experienced previously with some suggesting that drought and other extreme events may become more severe and more frequent under the certain climate change scenarios.

Regarding temperatures, KwaDube/ KwaZulu-Natal experiences 15-35 °C in the winter while in the summer the range is between 22-38 °C (UMhlatuze Municipal Area, 2008). KwaDube also experiences high humidity (this is a result of high temperatures and high levels of moisture). This is a common feature and one of the main characteristics of sub-tropical climates.

3.2.4 Soils

Barrios et al (2006: 2) state that, “ethnopedology”, which is the study of “local knowledge about soils and their management”, is crucial and has over the years been gradually acknowledged for its role in bringing greater understanding of land use patterns. Beater and Maud (1962) point out that soils of KwaDube are derivatives of varied parent material found in the geological strata of the region. They also add that the parent material as composed of the old and young rocks, some which are basaltic in origin and some which are a result of alluvial sedimentation that took place over millions of years not to mention the external influence of climate and hydrology. These give rise to different soil profiles; shallow and deep, hardpans and permeable or even profiles with impeded drainage all of which variable impacts on agriculture (Beater and Maud 1962).

Since KwaDube falls under the sub-tropical humid climate and is also part of the Indian Ocean Coastal Belt, the major soil characteristics are clayey, reddish-brown moderately to highly leached soils. van Anternwerp and Meyer (1996: 32) state that red soils fare better under irrigation because they are “normally the better drained soils”, hence their use under sugarcane cultivation. Barrios et al (2006: 2) caution on the role of humans in changing the soil structure that is ubiquitous which has manifested in KwaDube through “soil degradation, through deforestation, overgrazing, inappropriate tillage, nutrient mining, salinization and acidification”. In line with this observation, van Anternwerp and Meyer (1996: 32) mention that the monocultural sugarcane growing in the plantations of KwaDube has negatively impacted the soils through “increased acidification in dry land areas and salinity/ sodicity build-up in irrigated

areas”. KwaZulu-Natal as a province ~~has~~ the second highest provincial soil degradation index in South Africa” in the majority of its rural districts (Yemane, 2003: 21).

However, this is not to underplay the role of nature itself. The uMhlatuze Municipality Strategic Environmental Plan (2002) indicates that high terrain and heavy rains promote erosion, which result in shallower soils in some parts of KwaZulu - rendering such soils poor for crop cultivation. In comparison, the highly weathered yellowish brown soils that originate from volcanic activity that exposes dolerites and basalts are known to result in deep soils that are more clayey and agriculturally productive (Turner, 2000).

3.2.5 Vegetation

According to Burger (2008: 23) and Sieben (2011: vi), KwaZulu-Natal faces the ~~dilemma~~ of under-sampling” in relation to vegetation studies. This means that there are gaps in research and therefore knowledge of the vegetation of KwaZulu-Natal in general and KwaDube in particular is limited. van Antwerp and Meyer (1996) indicate that due to very high moisture levels in the greater part of KwaZulu-Natal, the area carries a wide variety of vegetation species. Just like with soils, vegetation is greatly influenced by parent material and other sporadic influences related to climate not to underplay the role of hydrology and topography. Van Antwerp and Meyer (1996: 30) hasten to point out that virgin areas composed of ~~natural bush~~, ~~road~~ reserves with natural grassland” and indigenous forests of great value still exist in KwaZulu-Natal.

Species variations exist in the vegetation of KwaDube’s rural and peri-urban communities as opposed to its coastal hinterland and other protected areas. Burger (2008: 11) describes northern KwaZulu-Natal and also the coastal areas as composed of a ~~high~~ diversity of plant species”. Seiben (2011) states that this is a result of high moisture levels. Seiben (2011) also adds that vegetation not only responds to environmental conditions, but also is a reflection of both the environment and nature of hydrology of the area. Burger (2008) describes other vegetation

communities of KwaZulu-Natal/KwaDube as varied in nature ranging from simple aquatic, wetland and *psammophitic* herbaceous communities to complex wetlands and dune forests.

Nonetheless, not all parts of KwaDube/ KwaZulu-Natal still carry pristine biomes. According to Mucina and Rutherford (2006: 740), “the most severe biodiversity loss occurs when a natural ecosystem is converted into an artificial system”. They claim that humans are known to have transformed almost half of the world’s land surface area into agriculture and urban systems. KwaDube is no exception. Vegetation quality and type has been altered as humans cleared for settlement (both rural and urban), agriculture (both in commercial areas especially sugarcane growing as well as subsistence), manufacturing and other land uses of the region, especially in and around Richards Bay. The Savanna grasslands and the wetland vegetation in the interior have been altered to accommodate human livelihood scenarios. Burger (2008: 44) also adds that the increase in population ever since the San hunter gatherers were forced to drift north west by the incoming more sedentary Zulu/ Xhosa/ Tswana societies and, finally, the colonial /apartheid expropriation of the land for intense industrial use, the dominant endemic primary vegetation (known) has been greatly altered giving room for newer vegetation complexes (succession vegetation) to flourish.

KwaDube land uses (see chapter 4) definitely point towards what Federal Geographic Data (2008: 9) calls “cultural vegetation” which:

...has a distinctive structure, composition, and development determined by regular human activity...planted or treated, and has relatively distinctive physiognomic, floristic, or site features when compared to natural vegetation.

3.2.6 Drainage

The Thukela/ Tugela is the main river in the basin that drains from the Drakensberg Mountains, flows through KwaDube headed east towards the Indian Ocean. The City of uMhlathuze Report (2008: 2) states that KwaZulu-Natal has “wetlands and fresh water lakes”. One of the large lakes

located to the north eastern part of KwaDube is Lake Chubu/ Qhubu surrounded by forests. Streams of water flow into the lake mainly from the southwest.

3.2.7 Economy

There is vast inequality in the economy of KwaZulu-Natal, from the highly industrious coastal urban areas to the underdeveloped rural interiors that are highly underdeveloped. The UMhlatuze Municipal Area Statistics (2008) states that mining, tourism, forestry (timber) and agriculture (commercial production of sugar cane) and the subsidiary manufacturing activities that are key income earners. The major industrial giants with great economic influence (even to the surrounding rural communities such as KwaDube) are the Richards Bay Company (RBC), Exxaro KZN, Ticor, Fiscor, Bell equipment and Mondi Craft (UMhlatuze Municipal Area Statistics, 2008). Some of their outstanding achievements have made KwaZulu-Natal to be known in the region as the exporter of aluminum and steam coal; and the world's highest miner of sand from which titanium, high purity iron, zircon, rutile, leucoxene and manganese pig iron/ steel are produced (UMhlatuze Municipal Area Statistics, 2008) . The port of Richards Bay opens avenues to large volumes of import and export opportunities. Despite all this rapid industrialization and success, more rural communities are still lashed by high unemployment and poverty (Jacobs et al, 2011: 6). These rural economies are basically dependent more on subsistence agriculture as their main source of living.

3.3 Research techniques

3.3.1 Methodologies

Research is typically guided or informed by a paradigm or theory (McDougal III, 2011). Denzin (1978: 307) confirms it by explicitly pointing out that “no study will be conducted in the absence of some theoretical perspective”. It follows therefore from the foregoing discussion that research methods are given direction and perspective by theories within that discipline. To recount, this study is informed by the SLF and adopting this approach influence the methods chosen which are discussed next.

3.3.2 *Methods*

McDougal III (2011) draws the reader's attention to the difference between methodologies and methods. According to his research, methodologies represent "paradigms, theories, concepts, and models the researcher uses to guide and interpret their research" while on the other hand he regards methods as tools that come in many forms such as "experiments, surveys, questionnaires, ethnographies, content analysis, interviews, and historiographies, etc. that are used to collect data" (McDougal III, 2011: no page). It is therefore important to note that methods in themselves while they may be manipulated by specific paradigms can be tailored to suit any theoretical predisposition. McDougal III (2011) gives an example of positivism as one paradigm that by its nature esteems quantification of variables and therefore will uphold the quantitative method more than any other technique. In research on the natural resource base in KwaDube, this study recognizes that while quantification is essential to show the magnitude of items discussed, it may not necessarily be enough. Therefore, the role played by qualitative techniques should not be underestimated.

Mararike (1999) supports an approach that places value on methods and methodology. He states that any form of research of this magnitude should employ methods and methodology. He stresses that the use of methodology without methods and vice versa implies lack of rigor in the process of inquiry. He points out that thorough research is necessary because in its true sense, any research should not just seek to add knowledge but to prompt "positive local action which would improve the lives of the people who were part of the research" (Mararike 1999: 20). He defines methods as a specification of steps to be taken in a given sequence to gather and treat data, while methodology has to do with epistemological and theoretical underpinnings of the methods applied in the various scientific disciplines. He also sums the relationship between methods and methodology: "methodology is the theory of method" (Mararike 1999: 21).

Dating as far back as 1966, early research that centered on scholars like Eyre and Johns (referred to as the modern geographers) brought a conscious study of human and ecological variables which enlightened people about the complex interactions between people and nature. Creswell

(2003: 3) points out that methods of inquiry are therefore developed to capture these complex interactions which bring understanding to the socio-economic reconstructs of humans, past and present. In addition, he also indicates that these meticulous data collection techniques or methods that social scientists can engage in analyzing, processing and presenting the data would help to inform of the perceptions of humans.

The choice of methods used in this research are driven by or derive from the need to capture the political, socio-economic factors that relate to, and influence the availability to as well as access and use of resources in KwaDube. The methods used in this research include quantitative and qualitative methods, which, when combined, are part of what is known as triangulation.

This research was part of a broad survey by the International Center for Research on Women (ICRW) in Southern Africa. This organization collected the primary data. For accuracy (since methods are not in themselves perfect), quantification of variables was necessary and so were the perceptions of the respondents collected through the use of qualitative methods of research. Hence triangulation, which uses both techniques, was adopted. This is in agreement with the GEF (2010), which states that in social science the use of two or more methods in a study is necessary for wholesome results and to also double or triple check the results. This research also used other research instruments such as questionnaires and focus group discussions to capture as much as possible what may have otherwise been left unexploited by the hard core nature of quantified data as well as for extrapolation in order to bring greater understanding of the natural resource base in KwaDube households.

3.3.2.1 Triangulation

This study adopted and used triangulation as its main method. Ghrayeb et al (2010: 96) define triangulation as “a method which relies on using multiple data sources and approaches to support a finding by showing that independent measures of it agree with it or, at least, don't contradict it”. This study used both the quantitative and qualitative research techniques. Various data sources were used in the field and literature review. Since the study deals with data that also

relates to households' perceptions that are gender, time and space sensitive; the use of multi-qualitative and quantitative strategies were found to be appropriate. Husein (2009: 4) states that it is important to combine two methods because both techniques are:

...designed towards understanding about a particular subject area of interest and both of them have strengths and weaknesses. Thus, when combined together, there is a great possibility of neutralizing the flaws of one method and strengthening the benefits of the other for the better research results.

Martella et al (1999) supports the above argument by indicating that there are four approaches to triangulation and these are use of multiple data, methods, investigators and theories. Mathison (1988: 14) states that researchers are encouraged to utilize these four dimensions of triangulation presented all of which are aimed at reducing partiality in the use of any particular source, investigator and method chosen.

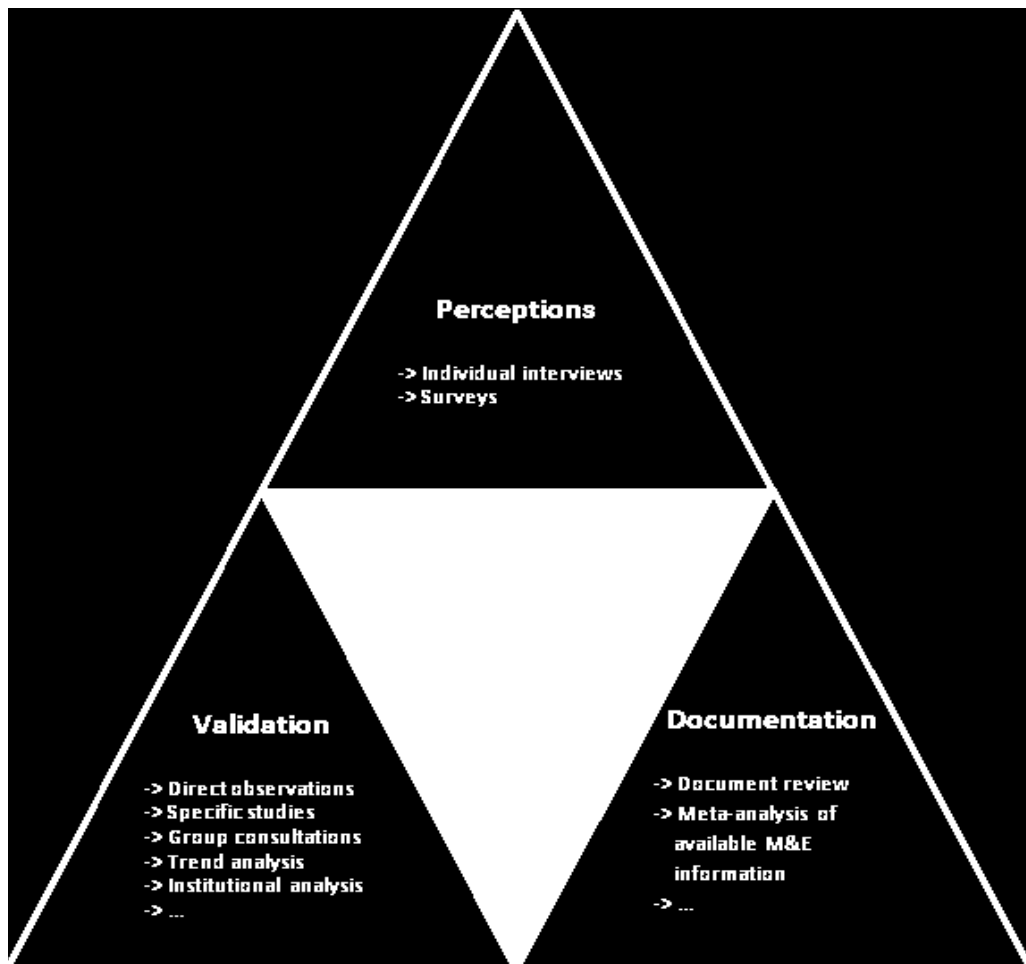
Figure 3.3 is a representation of the concept of triangulation, and according to GEF (2010: 3), triangulation is configured for "cross-checking information and analysis resulting from these three research areas". The research areas include perceptions, validation and documentation, all of which should culminate in the identification of evaluation findings (represented by the middle upside down triangle in Figure 3.3).

Mathison (1988: 13) summarizes the essence of this technique by stating:

Good research practice obligates the researcher to triangulate, that is, to use multiple methods, data sources, and researchers to enhance the validity of research findings. Regardless of which philosophical, epistemological, or methodological perspectives an evaluator is working from, it is necessary to use multiple methods and sources of data in the execution of a study in order to withstand critique by colleagues.

She also cautions researchers to be wary and be skillful in their handling of, drawing conclusions and documentation/presentation of data because inconsistencies, contradictions and convergence of data may still occur.

Figure 3.3: Triangulation



Source: Adapted from GEF (2010: 3)

3.3.2.2 *Qualitative Approach*

As part of triangulation, this research makes use of the qualitative method. Breakwell et al (2000) point out this method is applicable and relevant to social issues that would not be addressed by the rigidity of quantitative data. They define such data as verbal rather than numerical, and that the method outweighs the confines of quantitative research that is widely used but lacks flexibility in its approach to meanings of variables as well and conclusions. Cresswell (2003) and Krathwohl (1993) see the qualitative method of inquiry as exploratory in that it searches how people feel about conditions and circumstances they face; things they go

through or may have done as well what they think will happen. Morse (1991) noted that this method is best used when the research problem presents any one of the following characteristics:

- The concept is immature due to a conspicuous lack of theory and previous research;
- A notion that the available theory may be inaccurate, inappropriate, incorrect or biased;
- A need exists to explore and describe the phenomenon and to develop theory; or
- The nature of the phenomenon may not be suited to quantitative measures.

Judging by the nature of this research in KwaDube, two of the characteristics fit well. Firstly, KwaDube has not been fully explored in terms of the natural resource asset base of rural households since it is difficult to readily find data in archives, journals or any materials that answer pertinent questions which the research investigates at the local level. On the same note it is also crucial to realize that development in KwaDube in the past was selective or lopsided; emphasis was on the commercial activities including tourism and conservation efforts that are part of the national economy as opposed to rural development which still has a long way to go to bring households out of endemic poverty. As a result, available data focuses more on issues related to commercial activities such as sugar cane growing, for example.

Secondly, there is need to have a description of phenomena in KwaDube and be able to have postulations confirmed and established. This research, however, acknowledges the need for quantitative research because this will be the supportive proof to the generalizations made by respondents during the focus group discussions. An example of this would be a response that states that “households have very few cattle”, without actually putting down the figures of beasts per household, that may just remain an unproven opinion. With statistics, ideas/ opinions/ facts are made concrete and verifiable. This is the complementary nature of quantitative data which makes it appropriate for this study.

3.3.2.3 Quantitative Approach

The use of the quantitative method in research is widely accepted because of its distinguishable/ verifiable data that represents what was measured (Ni o -Zarazua, 2012; Krathwohl, 1993). Tewksbury (2009: 38) considers this method as the more –scientific approach to doing social

science". According to Breakwell et al (2000: 19) the quantitative method, addresses these questions:

- What the processes are?
- How often they occur?
- What differences in their magnitude can be measured over time?

Data collected by the researcher, guided by these questions, helps to search for meanings, patterns, correlations and impacts from which conclusions and generalizations can be made.

Compared with the qualitative, the quantitative method uses a more –substantial amount of literature to introduce the problem” (Cresswell, 2003: 31). The use of questionnaires as a tool in research to facilitate the quantitative method is most common. This is usually noted in the preparation for the research. This size of the documentation prepared does not usually correspond with the size of the results. The latter is more condensed. Sukamolson (n.d.) provides the following as list of some of the general advantages of using the quantitative method:

- Provides estimates of populations at large.
- Indicates the extensiveness of attitudes held by people.
- Provides results which can be condensed to statistics.
- Allows for statistical comparison between various groups.
- Has precision, is definitive and standardized.
- Measures level of occurrence, actions, trends, etc.
- Can answer such questions as "How many?" and "How often?"

Just like in the use of the qualitative method, the application of a –well designed study will provide you with reliable information to make informed decisions about policy” (Ni o -Zaraz a , 2012: 20).

3.3.3 Research tools and strategies

3.3.3.1 Sampling

Martella et al (1999: 267) regard sampling as:

a means of gaining information about the population without the need to examine the whole population, hence research samples in-order to draw inferences across the entire population.

Such inferences can only be appreciated if they are valid. Martella et al (1999) regard validity, as central and that all research should strive for high validity at all costs. They define validity as the degree to which accurate inferences can be made on the results of the study. They state that to achieve validity, sampling must be done accurately to ensure enough and correct representations of target populations. According to these scholars, when correct sampling is done, it should lead to both statistical and societal validity which means the results should “reach a certain level of confidence... and significance” (referring to size) and also to “determine if the results of a study are important to society” (Martella et al, 1999: 56). Indirectly, this speaks to the quantitative and qualitative elements of the study. Hence, when research is carried out, it should constantly be borne in the mind of researchers the importance of external validity without which the research itself has no value. This helps to guide the sampling procedure such that the sample population arrived at should produce results that will enable researchers to generalize the results of the study to other individuals and situations (Martella et al, 1999; Everett, 2000). Martella et al (1999: 120) suggest randomly selecting the respondents from a population because:

Simple random sampling is the only probability, sampling technique that ensures that each individual, object or event has equiprobability of being included in that sample.

This research adopted this strategy of randomly selecting the sample population through the use of the Geographic Information System (GIS) sampling tool. A multi-stage sampling approach was adopted. During the first stage 15 enumerator areas were randomly selected. In South Africa, municipalities are divided into wards and wards are divided into enumerator areas which

are made up of approximately 210 households. In each of the chosen enumerator areas, 20 points were randomly chosen on a map to ensure that the selection was unbiased. With the help of the Geographic Positioning System (GPS) the research team could locate these points. The household at or closest to the chosen point was interviewed. For any missed household locations or if a household declined to participate, the nearest household was picked as a replacement to ensure that the sample size remained the same. In this research the 300 households were seen as the ideal sample, representative enough to allow generalizations to be made about the target population of KwaDube and also about other similar communities of South Africa leaving diminished points of error. This sample becomes a decisive subset of the whole population from which findings are based. Furthermore, the target population of 300 was arrived at in relation to the broader study since this was calculated to be statistically significant in relation to the aims and objectives of the overall project.

3.3.3.2 Focus groups

Using purposive sampling, two groups of community members, one with males and the other with females, were chosen to participate in the focus groups. The focus group discussions were held in the KwaDube community hall. Tewksbury (2009: 47) states that focus groups are also regarded as “group interviews” with “guided conversations in which a researcher (or research team) meets with a collection of similarly situated persons for purposes of uncovering information about a topic”. Anthony and Raulin (2000) remind researchers that to correctly uncover the relevant and detailed information, selection of focus groups should be strategic. In this study gender was regarded as an important consideration and therefore the decision to have men and women only focus groups.

This approach is adopted by many researches because the literature indicates that given cultural practices and patriarchy in rural areas of Africa, men tend to dominate discussions and this also influence access and use of natural resources. Thus, the use of two focus groups was done to permit a genuine and unbiased examination of the perceptions, experiences and concerns of both men and women regarding natural resource use and access in KwaDube. Eliot and Associates

(2005) describe focus groups as the gathering of small groups of people who through the leadership of an able and competent moderator can prompt the gathering into viable discussions. They state that such groups need to be large enough to generate rich discussion but not so large that some participants are left out.

In this study, KwaDube participants were purposively chosen to reflect different age groups, interests (especially community members who farm, have small business ventures or are members of community organizations) and from different geographical locations within the study area. In each focus group there were 10 participants. Focus group facilitators or translators (men for the men's group and women for the women's group to assist in building rapport) were used to conduct the focus groups in isiZulu (the most widely used local language). The two sessions were held concurrently but separately on the same day in line with the suggested pointers from Elliot and Associates (2005).

Elliot and Associates (2005: 1) state:

A focus group creates an accepting environment that puts participants at ease allowing them to thoughtfully answer questions in their own words and add meaning to their answers.

To achieve this, these researchers encourage potential researchers to thoroughly plan what they ought to do before getting into the field in order to ensure that the discussions lead respondents to reveal those issues deeply imbedded in them. They suggest the use of a checklist with items such as focus group questions, recruitment flyers (where applicable), invitee tracking forms (where applicable), introductory remarks, sample consent forms and all the data capturing paperwork needed for both analysis as well as synthesized reports to be done. In line with this strategy and to ensure effective statistical and societal validity, this research was prepared ahead of time: Appendix 1 presents the questionnaire for the household survey and Appendix 2 for the focus group activities schedule. The study used participatory approaches during the focus groups allowing the respondents to be involved in mental mapping of land uses as well as in the ranking exercise of the most important household assets.

3.3.3.3 *The questionnaire*

The questionnaire was adopted and used in the study as the measuring instrument/ tool for both the quantitative and qualitative assessments. Malhotra (2006: 176) defines a questionnaire as ~~a~~ “a formalized set of questions for obtaining information from respondents”. Questionnaires are the ~~main~~ means of collecting quantitative primary data” (Molhatra 2006: 176), as a result they need to be well structured and clear. Molhatra (2006: 188) suggests that in order to achieve this and also lessen setbacks when wording questions researchers need to follow these guidelines:

- Define the issue;
- Use ordinary words;
- Avoid ambiguous words;
- Avoid leading questions; and
- Use positive and negative statements.

Appendix 1 contains different kinds of questions designed to direct the respondents to release the data needed for research findings:

- Close ended questions (answer in a box marked or circled);
- Single response questions (choosing one answer from list);
- Multiple response questions (more than one answer); and
- Open-ended / unstructured questions (answer in respondent’s own words).

(Adapted from National Research Center Inc., 2003: 2)

The main thematic areas covered in the questionnaire related to the demographic profile of respondents and households. This was followed by a focus on housing structure, especially to unpack natural resources used. The main focus of the questionnaire was in relation to the different types of natural resources used and their impacts of livelihoods. Appendix 2 (the focus group schedule) was also organized thematically as is Appendix 1.

3.3.3.4 Interviews

This research engaged trained researchers to conduct field surveys and interviews in KwaDube so that authentic material would be collected. Face to face interviews were conducted with an adult member in the chosen household. Trained fieldworkers who were fluent in isiZulu (as mentioned earlier) and English conducted the interviews. The use of the local language, in this case isiZulu, is supported by Temple and Edwards (2002). They state that language is at the center of conceptualization and the assimilation of a people's norms, values and belief systems other than just as a perception-bearing instrument. Therefore, issues are best addressed in their own language. The next stage is the actual data analysis.

3.3.3.5 Data analysis

In current times, most researchers carry out data analysis with the help of data analysis software. Some people refer to this process as “data cleaning”. Ni o -Zaraz a (2012: 11) points out there are computer software designed just for this purpose only and “are set up to expect survey data and will easily carry out all the calculations you need and many more”. This research chose to use the Statistical Package for the Social Sciences (SPSS). Ni o -Zaraz a (2012: 11) states:

SPSS produces high quality tables and graphs and the latest versions are quite user-friendly. Information is put in spreadsheet format, each column represents a variable and each row represents a case. You can put in labels that keep information about the meaning of the data close to the numbers involved.

From the SPSS the bulky information is reduced and presented in tabular form such that it is easy to interpret or make informative inferences. In this study, descriptive statistics were used including frequencies/ percentages and crosstabulations.

The qualitative data was distilled to specific themes and issues as advocated by Cresswell (2009). The information gathered (focus group notes, maps generated, ranking matrix, etc.) were critically examined to generate themes linked to the research objectives and questions. Additionally, the focus was on looking for interrelating themes and interpreting the meanings of the themes. Finally, the themes generated formed the framework for the analysis of both

quantitative and qualitative data in an integrated manner. Thus, a thematic data analysis approach was adopted. Figures and Tables were also used to present the findings.

3.4 Conclusion

This chapter has provided a detailed account of the physiography and the socio-economic structure of KwaDube community as a background to the study. It gives an idea of what natural resources households of KwaDube are likely to access and also gives the study a context so that correlations can be made between natural resources, systems of governance and the resultant livelihoods. This chapter also established that KwaDube though mainly under traditional rural authorities, has multiple land uses and it is also surrounded by areas (commercial farms, parks and urban complexes) with multiple land uses that compete with it for resources.

After delineating the differences between methods and methodology, this chapter also justified its use of triangulation as the main research method because of its use of both the quantitative (numerical and rigid) and qualitative (accommodates perceptions and attitudes) methods that enable the study to provide enriched and well augmented results and also whose individual shortcomings cancel each other out. This chapter also brought to light how respondents were sampled and put strategically in focus groups, as well as the use of the questionnaires and interviews to collect essential data. A brief explanation of the data processing procedures, which is the use of the SPSS was given. The following chapter focuses on data presentation and analysis.

CHAPTER FOUR

DATA ANALYSIS

4.1. Introduction

This chapter focuses on the presentation of data based on the systematic empirical evidence collected from KwaDube, KwaZulu-Natal. It analyzes and discusses data from respondents according to their demographic and socio-economic characteristics. It also uses research findings in the form of both qualitative and quantitative data to answer the pertinent research questions raised in chapter 1.

4.2. Demographic profile of respondents

Among the 300 respondents who participated in the KwaDube household survey, the majority of the respondents were male (62.7%) and the rest (37.3%) were females as shown in Table 4.1. This is not representative of the community profile. It is an indication of bias in the notion of headship in South Africa's rural contexts. The reality is that there are more women than men in KwaDube, KwaZulu-Natal. This is so because HIV/AIDS and outmigration of men has led to the prevalence of female-headed and child-headed households as evidenced by the 19-25 age group in Table 4.2.

Headship in the South African context is age and gender sensitive. Schatz and Madhavan (2009: 1) state that headship "implies the older persons' position as the head of the rural household". As indicated in the methodology chapter, heads of households were approached for interviews. For the focus group discussions, males responded on a greater scale. Research shows that rural women are less involved because of their insubordinate positions, part of which is brought about by low educational levels and cultural stigmas associated with patriarchy as discussed in chapter 2. In reality, even though there are fewer women participants in public forums, research continues to regard women as the main land and environmental managers, since they are more involved with subsistence agriculture more than men (United Nations 2008: 2).

Table 4.1: Gender of respondents (in %)

Gender	Frequency	Percentage
Male	188	62.7
Female	112	37.3
Total	300	100

The average age of the respondents was 49.26 years with the youngest being at the age of only 19 years and the oldest at the age of 80 years as shown in Table 4.2. The majority of respondents were in the 46-55 years range who made up a total of 23%. The 36-45 years group who made up 22.7% follows this age group closely. The least number of respondents belonged to the more than 75 years old age group (3.7%) and the less than 25 years old (4%). The latter category may be reflective of the emergence of child-headed families in South Africa as mentioned in chapter 2. Meintjes et al (2010: 42) concluded that the majority (88%) of South Africa's child-headed families are found in the three provinces of Limpopo, KwaZulu-Natal and the Eastern Cape and the least (0 to 9%) in Gauteng, Eastern Cape and the Northern Cape provinces. They explain:

- An analysis of the 2006 General Household Survey (GHS) found 0.67% of children living in child-headed households. This is equivalent to roughly 122 000 children out of 18.2 million children in South Africa.
- Most children living in child-headed households are not orphans at all. The 2006 General Household Survey found that only 8% of children living in child-headed households were children who had lost both their mother and father. 80% had a living mother.
- In 2006 almost half (44%) of child-headed households consisted of only one child. Most child-headed households have between one and three members.
- Over half (55%) of children living in child-headed households are 14 or older. In the vast majority (88%) of child-headed households there is at least one child who is 15 or older.

The survey indicates that 80% of South Africa's orphans have a living mother (Meintjes et al, 2010: 41). According to this report, the majority of the orphans are black and they lack most of the basic services and proper sanitation. Some of the orphans are absorbed into families with

adults according to kinship networks which assist in caring for these children and at the same time in reducing the prevalence of child-headed families (currently not on the increase) (Meintjes et al, 2010).

Table 4.2: Age (in years) of respondents

Age	Frequency	Percentage
19-25	12	4
26-35	46	15.3
36-45	68	22.7
46-55	69	23
56-65	48	16
65-75	46	15.3
>75	11	3.7
Total	300	100

$$X = 49.62$$

Table 4.3 shows that most respondents are engaged in some form of main activities. They engage in activities that are both subsistence and commercial (which explains the dual economy status of South Africa) with the majority (a total of 62%) working in subsistence agriculture as owners of the land (61%) or selling their labor power to livestock agriculture in order to earn a living (1%). Dependence on agriculture by the rural poor is still a common phenomenon in South Africa's provinces even in the post-apartheid era and after land reform. This is supported by Statistics South Africa (2011) whose examination of food security and agricultural production particularly emphasize the importance of subsistence agriculture in relation to poor households specifically. According to GHS (2010: 6), KwaZulu-Natal has 23.2% of its households involved in agricultural production. This is a number that is higher than the national standards of less than 22%. Manona (2005: iv) states that the reason for this high percentage is that most of the strategies employed by government to reduce poverty in rural areas are land-based development strategies, including agriculture". He further explains that even though it seems that agriculture is a driver for development in rural South Africa, a decade after the demise of apartheid, it appears that very little concrete improvement in rural people's livelihoods has taken place" because rural people constitute over 70% of the poorest people in South Africa (Manona, 2005: iv).

Slightly over a third of the women respondents (33.7%) indicated that they do housework including childcare. This is typical of South Africa where women play multiple roles. Mohammed (2008: 3) gives examples of these roles to include “tasks such as house work, cooking, and caring for children, old people, and sick people”. She adds that these women are often not acknowledged nor remunerated for playing these roles and that is why this work is called “invisible work”. The United Nations Division for the Advancement of Women (UNDAW, 2008: 2) explains the crucial role that rural women play in the development of rural economies in both developing and developed countries:

In most parts of the developing world they participate in crop production and livestock care, provide food, water and fuel for their families, and engage in off-farm activities to diversify their families’ livelihoods. In addition, they carry out vital reproductive functions in caring for children, older persons and the sick.

The report also adds that sometimes childbearing disturbs women’s education and advancement of any sort. It further notes that women’s rights and priorities are often insufficiently addressed by national development strategies and gender equality policies.

The UNDAW (2008: 3) therefore suggests:

Given the critical role of women in rural areas, addressing gender inequalities can increase the efficiency of resource use and enhance rural development outcomes. Issues such as land and property rights, access to services and resources, food security, employment and income and participation in decision-making need to be taken into consideration.

This organization argues that the promotion of gender and empowerment of women is what constitutes smart economics. According to the World Development Report (WDR, 2012: 239), women are often marginalized to and trapped in “low-paying jobs and low-productivity businesses”. It proposes that it is important to release women’s creative production and contribution to development projects from all constraints (WDR, 2012: 239):

Breaking out of this productivity trap thus requires interventions that lift time constraints; increase access to productive inputs among women, and correct market and institutional failures.

Table 4.3: Main activities the respondents are engaged in (n=300): Multiple responses

	Frequency	Percentage
Agriculture/ livestock (self-employed or subsistence)	182	61
Agriculture/ livestock (laborer/employee)	3	1
Casual labor (non-agricultural)/ mining/ quarrying)	41	13.7
Artisan/ services/ manufacturing/ fishing	34	11.3
Professional/ salaried work	11	3.7
Small business/ business out of home	16	5.3
House work/ Child care	101	33.7

A smaller percentage of respondents indicated that they are engaged in income generating activities (identified in Table 4.3) which include standing in as casual labor in the non-agricultural sector (13.7%) and artisan, services, manufacturing and fishing (11.3%). A few respondents (3.7%) identified professional or salaried work. These results are representative of low educational levels of most respondents which are discussed later. It means that the majority of households do not directly earn an income and this is an indicator of poverty in the community and lack of job opportunities. This is illustrated by the absence of income or low incomes in Table 4.4. The fact that a higher percentage of respondents are engaged in subsistence agriculture suggests that most poor households rely heavily on natural resources for survival. Respondents indicated during the focus group discussions that agriculture among all other development drivers is the main factor influencing land clearing in KwaDube. Respondents have gone for many years with pronounced lack of resources, including access to adequate land.

A few respondents are engaged in entrepreneurship in small businesses that sometimes operate from homes and in some cases whose legality is questionable (such as *shebeens* or local taverns). Some of the small businesses include tuck shops as well as selling wild produce at open markets and at bus stops. Table 4.29 presented later shows other natural resources respondents sell.

Like other rural communities, KwaDube respondents experience variations in income. Alemu (2012: 9) explains that variations in income are quite common in South Africa's rural economy because of differences in sources of income, part of which include:

...income from wages, salaries and commissions; income from own businesses; income from sales of farm produce and services; income from rents and interest; and finally, income from remittances, pensions and grants.

Alemu (2012) further indicates that these distinctions are categorized into wage (salaried) employment and non-wage or self-employment. This is what differentiates incomes among households. Hence, while it is generally true that rural South Africa is composed of poor households, Alemu (2012: 2) states that it is important to examine the households more closely, as most –wage income earners are relatively non-poor than those that depend on agriculture as their important source of income”. Literacy levels play a significant role in determining livelihood strategies adopted by households and also determine the size of income received, because the skill levels determine the employment opportunities household members are exposed to. With this backdrop, income disparities shown in Table 4.4 are not surprising.

The average monthly income of the households interviewed was calculated to be R4 808.83. Some respondents (4.7%) practically had no income (most probably only farm and non-wage households). This also suggests that most households are poor. The income range was from none to R16 000. The largest percentage (15.7%) of the respondents earned between R2 000 - R3 000 followed closely by the 15.3% who earned between R4 000 - R5 000 (most probably farm and non-farm waged income) and 15% between R3 000 - R4 000. A significant proportion (46%) of the respondents have an income of between R2 000 - R5 000. Table 4.4 shows that less than 9% of the total respondents earned in excess of R5 000 per month and only 0.3% of the respondents did not earn anything at all. These incomes levels in Table 4.4 closely correspond to the activities respondents identified with in Table 4.3. It is also important to note that household incomes are supplemented by social grants and pensions as well as remittances, highlighted during the focus group discussions, which are key to the survival of the family. For some households these are their only sources of monetary income. South Africa recognizes that there is child poverty among rural households. Meintjes et al (2010: 47) reinforce this:

...our comparative findings suggest that children in child-only households experience greater income poverty and have poorer service access relative to those living in all mixed-generation households.

These incomes in themselves are not representative of the ‘worth’ or intrinsic value of the incomes of households. This is because R2 000 in a family of two may provide for their basic needs whereas that same R2 000 in the hands of a household head with six mouths to feed may not produce the same result. Therefore, it is important to match size of income with household size as part of a wide process of determining poverty levels of households and measuring the true worth of their wealth. In most cases, African households have high dependency ratios (Ocholla-Ayayo, 2000).

Table 4.4: Monthly income (in Rands) of household

Monthly income (in Rands)	Frequency	Percentage
None	1	0.3
1 – 1 000	14	4.7
1001 – 2000	32	10.7
2001 – 3000	47	15.7
3001 – 4000	45	15
4001 – 5000	46	15.3
5001 – 6000	28	9.3
6001 – 7000	22	7.3
7001 – 8000	21	7
8001 – 9000	17	5.7
9001 – 10 000	18	6
> 10 000	9	3
Total	300	100

$$X = R4\ 808.83$$

Close to a third of the households (30.7%) in KwaDube receive remittances as shown in Table 4.5 while 69.3% of the respondents indicated that they do not receive remittances. Posel (2002) wonders what compels people to remit and what causes them to remit what they remit; why others remit consistently while others remit sporadically. She states that no particular pattern emerges, however, in her research she noticed the following patterns (Posel, 2002: 8):

- Approximately 35% of all African households contained migrant workers. But not all migrant workers remitted income to the rural household.

- Approximately 21% of all African households with migrant workers did not receive any remittances during the year of survey.
- Where remittances were received these ranged from R1 to R1 500 a month with a monthly average of R191.78.
- Not all migrants who remitted, however, did so regularly.
- One third of the remitters remitted less than eight times during the year and more than 20% of these remitted once.
- Migrants who remitted less frequently did not compensate by sending more income less often.

Out of these observations, Posel (2002: 9) suggests that other than migrants being altruistic, there are “hidden factors that are individualistic in nature that cause these differences in remitting”. She gives an example of some migrants that remit to keep ties with their homeland so that their homes act as safety nets if they have to come back due to the uncertainties faced in the countries they migrate to. For South Africa in particular, she points out that legislation preventing urbanization and cross-border migrants probably forces migrants to actively maintain connections with their rural community and family and helps to establish a pattern of oscillating migration in and out of South Africa. She also cites the improvement in livelihoods through grants and pensions as well as just the general lifting of standards of livelihoods for rural people due to increased income generating alternatives available to the rural households, as encumbrances to the flow of remittances.

Table 4.5: If household received remittances in the last 12 months

	Frequency	Percentage
Yes	92	30.7
No	206	69.3
Total	300	100

Table 4.6 shows grants received by respondents in KwaDube. This is consistent with the rest of the provinces in South Africa where households receive assistance from government through its

social security system. These grants are partly aimed at reducing poverty, it therefore follows that communities with grants are poverty-stricken. As indicated in Chapter 2, a household can have access to multiple grants. An example can be a HIV positive woman receiving the AIDS grant and at the same time a child support grant if she takes care of children. Meintjes et al (2010: 44) point that up to 2006, –South Africa’s social security system entitled ‘primary caregivers’ of poor children under the age of 14 years to receive a Child Support Grant valued at R190 per month, considered equivalent to US\$22”.

Case et al (2005: 480) also state that large numbers of KwaZulu-Natal households were able to easily access child support grants:

36% of all children under the age of 7 have had some contact with the Child Support Grant system, with no difference in contact for girls and boys. Between 80 and 90% of children aged 1 to 6 who have had contact with the system were receiving a grant in 2002.

In KwaDube the majority of the respondents (54.7%) receive the child support grant and 24.7% receive the old pension grant. Some of the respondents lack access to grants (35.3%). A few respondents (3.7%) received a disability grant and one respondent stated that the household received an HIV/AIDS grant.

Table 4.6: Grants received by households over the last 12 months (n = 300, in %): Multiple responses

	Frequency	Percentage
No grant	106	35.3
Old age pension	74	24.7
Disability grant	11	3.7
Child support grant	164	54.7
HIV/AIDS grant	1	0.3

The average number of household members dependent on the household head for sustenance was 2.47 and ranged from none to 7 (Table 4.7). Thirty percent of the respondents had 2 dependents followed by 23.7% who have 3 dependents. Fewer households (less than one fifth) have 4 to 7

dependents. Meintjes et al (2010: 40) indicates that due to the prevalence of HIV/AIDS there is an increase in foster care for orphaned children and therefore an increase in the number of dependents that may not be household-heads' own children.

Table 4.7: Number of household members dependent on household head for sustenance

Number of people	Frequency	Percentage
None	27	9
1	48	16
2	90	30
3	71	23.7
4	42	14
5	18	6
6	3	1
7	1	0.3
Total	300	100

$$X = 2.47$$

Table 4.8 shows that a significant number of respondents (more than 86.3%) are literate and less than 20% have between low levels of literacy and no literacy at all. The results also reveal that 6% of the respondents supplemented their education with adult literacy classes. However, it is important to note that this is in basic elementary level education. Focus group discussions revealed that most of this basic elementary education was in isiZulu and very limited in English as a second language. However, the next generation understood and comprehended English well because of increased access to improved post-apartheid primary and secondary schooling. This in part explains why there are high levels of employment of adult respondents in the subsistence sector, more than in the formal highly paying jobs reflected in Table 4.4.

Presently, rural households in KwaZulu-Natal still have very low levels of education. According to the Provincial Profile on KwaZulu-Natal (2004: 2), only a small percentage of the population finishes school. This report states that approximately 36.7% of the population aged 20 years or older in KwaZulu-Natal had completed Grade 12. Kallaway (2001) makes a similar observation and links these low educational levels in poverty-stricken rural households with poor use of modern environmental management technologies.

Although some developing nations have in more recent years raised levels of education in rural communities, the levels still fall below the standards of developed nations, let alone that of cities in these nations, especially in SSA (Education For All – EFA, 2003: 1). This report argues that such children end up being a source of labor or the human assets the family uses for all forms of farm activities. This is similar to Wikan’s (2004: 6) observation in reference to two villages in Botswana, namely, Tutume and Letlhakeng. Wikan (2004: 8) noted that “poor households, have less educational resources than others”. For example, Letlhakeng was the poorer village of the two; it had 75% of its household heads with no formal education at all because there is really no tradition of formal education in this community (Wikan 2004: 8). On the other hand, Tutume with a long tradition of sending their children to school was fairly better off than the former village. These patterns are also seen in other African countries like Ghana. Jolliffe (2004: 306) found that among the Ghanaians households, increasing the educational attainment of farm households is found in its impact on off-farm activities, including the reallocation of time away from farm work. This seems to be the trend in other developing nations too. Escobal (2001: 504) also made a similar observation about Peruvian households:

The effect of education is very clear: the higher the education level, the lower the incentive to obtain income from own-farming, and the greater the incentive to commit time to non-farm self-employment activities as well as non-farm wage employment.

Mararike (1999) argues that it is not only formal education (though vital) that matters in environmental issues. He recommends that development strategies tap into the rich indigenous knowledge systems that households possess that are inherent in their communities that these communities have relied on for many years.

Table 4.8: If respondent is literate, attended school or has taken literacy classes for adults (n=300, in %)

	Literate	Attended school	Literacy classes for adults
Yes	86.3	84.7	6
No	13.7	15.3	94
Total	100	100	100

4.3. Household profile

The average number in the household was 4.6 and ranged from 1 to 6 (Table 4.9). Larger household size reflects demands that are likely to be placed on the natural resource base. For example, the larger the family, the greater the demand for food and other amenities. Data shows that the majority of the respondents live in households of between 4 to 6 people which is representative of the profile of South African communities who currently take in children orphaned by AIDS. Additionally, most African rural households are extended families. They live according to kinship and therefore households tend to be large. Only less than 2.7% of the respondents had 2 or less household members.

Table 4.9: Number of people living in household

Number of people	Frequency	Percentage
1	2	0.7
2	6	2
3	48	16
4	87	29
5	68	22.7
6	89	29.7
Total	300	100

$$X = 4.6$$

Of the existing tenure systems offered by the South African government (Table 4.10), 28% of the respondents have Permission to Occupy (PTOs) rights followed closely by the customary tenure system (26.7%). During the focus group discussions it emerged that the majority of KwaDube men support customary laws. In their opinion, procuring of land is better done through the traditional authorities. However, the Association for Rural Advancement (AFRA) (2004: 14) states that not all *AmaKhosi*'s (traditional leaders/ chiefs) customary tenure arrangements always go smoothly. AFRA reports on the case of the Malibuye KwaTembe community of Igwavuma, one of South Africa's rural communities under traditional authority influence where the presiding *Inkosi* over this community did not consult with the community in the creation of the Tembe Elephant Park in 1978. This joint decision made with the government officials in Pretoria seems to have been poorly done leaving the community disappointed and lacking access to

resources. AFRA (2004: page no) states:

There was no agreement reached on the boundaries, however, it is not clear whether the *Inkosi* agreed on the boundaries, because when he was approached on the matter, he kept quiet. The community members were moved out in 1982 and left with barren land in their area of jurisdiction. They were only given a few implements with which to establish structures and homesteads.

In another case, AFRA (2004) points out how conflict arose in the community of Dukuduku Forest in KwaZulu-Natal over tenure issues. When this case was brought before judgment for restitution, the *amaKhosi* was blamed for being divisive since he lodged his own restitution claim, totally disregarding his affiliation with the community of Dukuduku that he represented. The report indicates that the *amaKhosi* “remained silent on all the negative things” that were done to the community, and that the community was at a loss of words and were greatly concerned that “if the *Inkosi* neglects and does not assist the people, to whom do they have recourse for support” (AFRA, 2004: 14).

There is evidence that tenure issues are quite difficult to deal with in most communities as demonstrated by AFRA. AFRA (2004: 19) gives examples of issues they have dealt with among an innumerable list of challenges households face in securing tenure:

- Lack of co-operation between the government departments and communities.
- Government making promises it does not keep.
- Lack of co-operation between communities and AmaKhosi.
- Chiefs selling off their people.
- Lack of unity within communities.
- Arrogance from government departments.
- People being chased away illegally from their areas.
- Decisions being taken without any consultation with communities
- People still endure abuse from white people.
- People are given land that is too little.

The concerns raised by AFRA (2004) in relation to traditional authorities did not emerge directly from the findings of this study. However, during the focus group discussions concerns were raised in relation to the illegal sale of land, inequalities in relation to size of land allocated and community tensions. The existence of 16% of homesteads on informally occupied land implies that there is land scarcity related to poor tenure arrangements (as noted in section 4.2.). It also speaks to the migratory nature of the some households, which may be associated with illegal migration of farm and/ or industrial workers that come to take up job when opportunities open, and when they fall out of work and cannot pay rent therefore they end up taking residence in informal places and between places while looking for the next job.

Table 4.10: Crosstabulation of gender and land tenure type of current homestead (in %)

	Male (n=188)	Female (n=112)
Freehold	14.8	12.5
Permission to occupy (PTO)	28.2	28.6
Customary	29.3	22.5
Informally occupied	13.8	19.6
Rented	4.3	14.3
Leasehold	9.6	2.7
Total	100	100

Table 4.8 reveal that there are different types of tenure systems which include private (title deeds) and traditional/ communal arrangements that households have access to. However, there seems to be some confusion about what rights are associated with access to land in relation to inheritance resulting in a range of options being forwarded by the respondents. Additionally, KwaDube is a traditional area so it is unclear as to how and under what conditions residential land is being bought and sold. Despite the confusion in relation to type of ownership, the responses reveal that almost equal proportions of males (14.8% and 28.2%) and females (12.5% and 28.6%) identified freehold and PTOs, respectively. However, more males (29.3% and 9.6%) than females (22.3% and 2.7%) stated customary and leasehold tenure types, respectively. On the other hand, more females (19.6% and 14.3%) than males (13.8% and 4.3%) indicated informally occupied and rented, respectively. These are more insecure forms of tenure. It is important to note that when the concept of freehold tenure type was raised during the focus group discussions,

participants generally agreed that people felt that they owned the land. They could not confirm whether households in the area had title deeds for their property.

Lyne et al (2004: 18) state that according to census surveys of transfer deeds, only 121 484 hectares of farmland were acquired during 1997-2001 by historically disadvantaged people in KwaZulu-Natal". This 121 484 hectares is equivalent to only 2.3% of the total farmland due to them. Lyne et al (2004: 18) concluded that the Settlement/ Land Acquisition Grant (SLAG) program did not generate a rate of farmland transfer in KwaZulu-Natal consistent with the South African government's goal of redistributing 30% of white-owned farmland to disadvantaged people over 15 years:

The SLAG program not only redistributed less land than did private purchases, but also transferred land of much lower quality, and about *five* times less total wealth, to beneficiaries whose tenure is relatively insecure. There is also further survey evidence that insecure tenure on SLAG projects in KwaZulu-Natal has impacted adversely on the beneficiaries' ability and incentive to finance seasonal inputs and improvements to cropland. Again, this outcome is not consistent with the expectation that land redistribution would result in a highly efficient small-scale farm sector.

Lyne et al (2004: 20) attribute some of these failures to the individuality of methodologies and techniques adopted by the different provinces of South Africa in the implementation of government-driven land reform programs. They indicate that the KwaZulu-Natal Provincial Departments of Land Affairs (PDLA) did not approve and take on the equity sharing projects which proved to have succeeded in other provinces. They therefore call for greater integration in the land reform programs for the benefit of those in great need, the households facing diminishing equity.

Focus group participants were also asked about the ownership of land in the community (Table 4.11). The role of the traditional authority was deemed to be prominent. Focus group participants unanimously agreed that land belonged to the *Inkosi*/ traditional authority at community level. At the household level almost all participants (except some men) stated that either men or women could own land by either inheritance or purchasing it. Some of the men were adamant that

women are not allowed to own land, including widows who were allowed to make decisions over the land only until their son/s could take over. One woman was aware that the government in South Africa was attempting to ensure that women, especially female-headed households, had access to, and are able to own land. Some of the women indicated concern over this issue, and were pessimistic about it. Research recommends increasing women's ability to own assets such as land and also to gain ground in other social rights which are essential element in determining or contributing to positive development outcomes (Jacobs et al, 2011).

Table 4.11: Ownership of land (focus group responses)

	Men	Women
<i>Inkosi/</i> traditional authority	X	X
Head of household/ title deed owner (mainly male or female widows)	X	X
Child household heads have access	-	X

Commenting on the land issue in South Africa during the post-apartheid era, Rugege (2004: 2) points out that some households are still yet to get land because the land reform program was slow. He states that the main objective of the struggle for independence was for communities to get land. According to Rugege (2004: 3), this was to be done through the following three strategies starting from 1995:

- Restitution to restore land rights to those who were dispossessed of them under discriminatory laws;
- Redistribution to make land more accessible to those who had previously been denied access; and
- Tenure reform to give security of tenure to labor tenants, farm workers and other rural dwellers who lived on land without secure rights.

Delays in achieving land reform objectives have left multitudes of households, including KwaDube households, suffering as they remain in restricted areas with diminishing natural resources. These views were raised in the focus group discussions as well.

Table 4.11 shows that both men and women during the focus groups acknowledged that the head of households were the members of the family with documentation or a title deed. They were regarded as the landowners. In the case of child-headed households, only a few women supported that they should acquire land while male respondents in the focus groups did not feel that child-heads should own land. The general opinion was this would disrupt the structure of society according to traditional laws. The emergence of child-headed households is linked to HIV/AIDS.

Maqoko and Dreyer (2007) indicate that due to the prevalence of HIV/AIDS in South Africa, incidences of child-headed families are high. They state that about 840 000 children including those of KwaZulu-Natal have been recorded as orphaned. This number is expected to reach a staggering 3 million by 2015. According to customary law, land is passed on from father to son but with the dynamics of HIV/AIDS many children find themselves heading homes with little power to gain resources for their siblings. In addition, Maqoko and Dreyer (2007: 718) also state that South Africa's "child-headed households are not new at all, sometimes they have the support of an older person from the neighborhood". Such an elder from the local community or of kinship would ensure that the children have food. Even with such assistance, Maqoko and Dreyer (2007) reiterate that these orphaned children's livelihoods are poorer than children with parents.

The average number of years that respondents lived in the current homestead was 14.2 years and ranged from less than 5 years to more than 40 years (Table 4.12). Almost half of the population (a total of 44.3%) indicated a length of stay of less than 10 years in the current homestead, which is relatively recent. This may indicate increased pressures on the natural resource base in the area due to increased residential occupation. Some of it is a result of reorganization of land as new development projects in forestry and wildlife protection such as the creation of parks. Judging by the effect of land reform programs and increase in migration, people relocating and some coming in to take up employment in local wage industries, more and more people spend less time in an area. In terms of the results, 20.7% respondents spent between 11 and 15 years, 15.7% between 16 and 20 years, 8% between 21 and 25 years and 6% between 26 and 30 years in the current

homestead. A few households occupied their current homes for 31 to 35 years (1.3%), 36 to 40 years (2.3%) and more than 40 years (1.7%). There is strong place attachment for many respondents who have lived in the area for more than 20 years.

Table 4.12: Length of stay (in years) on current property

	Frequency	Percentage
< 5	52	17.3
6 – 10	81	27
11 – 15	62	20.7
16 – 20	47	15.7
21 – 25	24	8
26 – 30	18	6
31 – 35	4	1.3
36 – 40	7	2.3
> 40	5	1.7
Total	300	100

$$X=14.2$$

There were mixed views concerning property values in KwaDube as reflected in Table 4.13. The majority of the respondents (38.7%) indicated that there was increase in property value over the past five years. However, 33.3% did not see a significant change. Sixteen percent of the respondents did not know if there was any change. This is also indicative of varying perceptions of people because what is valuable to one person may have a low value to another. Overall the results were skewed.

Table 4.13: Perceived changes in property values in last 5 years

	Frequency	Percentage
Increased	116	38.7
Decreased	35	11.7
No change	100	33.3
Do not know	49	16.3
Total	300	100

According to Table 4.14, slightly more than half of the respondents (52.3%) indicated that their housing structure was stand-alone brick homes. From observations in the community and the

focus group discussions, it was noted that most homesteads (44%) had a traditional structure (hut) on the property because of its traditional and cultural significance. These traditional structures are made of pole and mud which are natural resources collected from their local environment. Also, thatch grass is used for roofs. Households construct a number of these structures in their homestead, each with its own purpose according to its cultural significance. A few respondents (3.7%) expressed that they were living in informal structures. Such structures are common and they are generally a pointer to the presence of illegal or unlawful occupation in some parts of the communal lands. Respondents during the focus group discussions also indicated a decrease in the collection of thatch grass due to better housing (brick with iron or zinc makes up 83% of structures) that is now common.

Table 4.14: Main housing structure on property

	Frequency	Percentage
Informal	11	3.7
Traditional	132	44
Stand alone brick structure	157	52.3
Total	300	100

The materials used in the construction of houses in any community are usually a reflection of the lifestyle of people and also indicate the level of utilization of the natural resources. The majority of respondents in Table 4.15 (76%) still use mud as their flooring material. Less than 20% use concrete. Mud is readily available in the community and cheap so anyone can afford it, whereas it takes money and skill to put a concrete floor. Only those with better financial assets from remittances, grants or employment can afford it to purchase the materials to make the concrete floors.

Table 4.15: Main structure of floor

	Frequency	Percentage
Mud	228	76
Concrete	44	14.7
Other	28	9.3
Total	300	100

Just like the floors, roofs are indicative also of the socio-economic status of the owner. As shown in Table 4.16, 83% of the respondents have iron and zinc roofs. Only 15% still use the traditional thatch for their main structure. However, as indicated earlier, most homesteads still have traditional huts on the property although these are no longer the main structure. Because roof tiles are expensive, only 1.7% can afford them. Lastly, one respondent used cardboard for a roof. As pointed out earlier, there are income disparities in KwaDube and outwardly this is reflected in material possessions such as household materials.

Table 4.16: Main structure of roof

	Frequency	Percentage
Cardboard	1	0.3
Thatch	45	15
Iron/zinc	249	83
Roof tiles	5	1.7
Total	300	100

According to Table 4.17, 74% of the respondents of KwaDube own pit latrines or ventilated improved pit latrine (VIP) latrines. Only 23% of the respondents can afford a flush toilet, and a very insignificant number (3%) own a chemical toilet. Sah and Negussie (2009: 1) state that the pit latrine is less expensive to construct than it is to construct a VIP or a flush toilet. In a study done in 2005 by the Organization for Economic Co-operation and Development (OECD cited in Sar and Negussie, 2009), they observed that average costs of latrines were varied. Using the exchange rate of one British pound equals one and half United States dollars; they (Sar and Negussie, 2009) came up with a report on the pricing for three of the latrines found in SSA. It cost 600 pounds in capital cost to make a simple pit latrine, 1 200 pounds to make the ventilated improved pit while the pour flush cost 1 650 pounds (Sah and Negussie, 2009: 2).

This data emphasized that these costs do not even cater for all the costs of what needs to be done such as the “collection systems, wastewater treatment facilities; re-use options or re-allocation to the environment” if at all the households or community members decide to recycle the waste (Sar and Negussie 2009: 2). Duncker et al (2007: iii) stress that households in communal areas

are encouraged to use new technologies (in line with the principles recycling waste) need a complete overhaul of perceptions in order to accept strategies that otherwise seem challenging so as to achieve ecological sanitation greatly needed in rural communities. Describing ecological sanitation, Duncker et al (2007: iii) state:

It is a sanitation system that turns human excreta into something useful and valuable, with minimum risk of environmental pollution and no threat to human health. It is a sustainable closed-loop system that treats human excreta as a resource, not as a waste product. Excreta are processed until they are free of disease organisms. The nutrients contained in the excreta may be recycled and used for agricultural purposes.

There is need therefore for increased environmental education to encourage the popular processes of reducing, reusing, and recycling; for global competence in resource consumption and use.

Sanitation and hygiene are crucial issues in people's lives. One can measure the household's level of awareness about hygiene by assessing their disposal of waste (Sar and Negussie, 2009). The presence or absence of toilets, and their quality has a dual purpose of acting as an indicator not only of health but also of the financial asset base of a household. Sar and Negussie (2009) also point out that toilets contain waste that would otherwise harm the health of any community. The type of toilet a household has determines how waste is being disposed of. Open defecation leads to contamination of nearby water sources and also spread of diseases such as cholera and therefore incapacitates households both in their asset portfolios and in their health. It has a direct impact on the quality water resource households need on a daily basis. Less than 2% of respondents of KwaDube do not use a toilet which is also a global concern. Sar and Negussie (2008: 1) indicate that:

2.6 billion people, more than 40% of the world's population, do not use a toilet, but defecate in the open or in unsanitary places. Sub-Saharan Africa remains the area of greatest concern (37% coverage). It is a region of the world where, over the period 1990–2004, the number of people without sanitation increased by over 30%.

Table 4.17: Structure of toilet

	Frequency	Percentage
None	5	1.7
Bucket	3	1
Pit or VIP latrine	222	74
Flush toilet	69	23
Chemical toilet	1	0.3
Total	300	100

Table 4.18 below shows the main household water supply in KwaDube. There are marked differences among households on how they acquire their water. Forty three percent of the respondents have tap water on site, while 42.3% have the taps in their dwellings. Fewer (17.3%) get their water from a public tap. Some of the respondents (11.3%) use the stream/ river/ dam as their source of water. This makes them vulnerable to water borne diseases carried from upstream where a totally different water usage may exist. Almost 5% of the households get their water from other sources including communal boreholes (2.3%), rainwater tanks on site (2.3%) and neighbors (0.7%). The phenomenon of harvesting rainwater is supported by Helmreich and Horn's research (2010: 119) who state that Africa is one of the continents that has:

a long standing tradition of harvesting water for thousands of years, a process which is defined as technology used for collecting and storing rainwater from rooftops, land surfaces or rock catchments using simple techniques such as natural and/ or artificial ponds and reservoirs.

Due to limited income, only an insignificant percentage of respondents can afford to construct tanks and reservoirs that hold a lot of water to last many months. Besides households share resources and it is likely that neighbors would also depend on the water and it would not last long. One of the respondents indicated that they did not have a source of water. This is not strange at all in some communal areas of South Africa considering that some development projects in forestry and parks have dispossessed families and left them without access to water supplies. For example, AFRA (2004) reports that the Tholwethu community was thrown off the land to make room for a new park. This community had occupied this land under a particular owner, but at his death, the incoming new owner (son of dead owner) denied them ~~direct~~ access

to water because when the game reserve was being established, the river fell within the boundaries of the game reserve” (AFRA, 2004: 17). They also lost their grazing land amongst a host of all other problems they experienced which brought torment to the people. This is evidence of how tenure systems can really impinge on households’ access to deserved natural resources. Therefore, it is not uncommon to have households that lack reliable sources of water.

Table 4.18: Main household water supply: Multiple responses

	Frequency	Percentage
Tap water in dwelling	127	42.3
Tap water on site	129	43
Public tap	52	17.3
Communal borehole	7	2.3
Rainwater tank on site	7	2.3
Stream/ river/dam	34	11.3
Neighbor	2	0.7
None	1	0.3

Table 4.19 represents sources of energy households depend on. The greatest percentages of respondents depend on wood for cooking (56%) and heating (47.3%). Fuelwood harvesting has been known to be one of the greatest predators of forests. Besides this dilemma, current energy debates also focus on the damaging effects of indoor wood smoke. Damte et al (2012: 1) point out that despite these disadvantages:

Many people in developing countries rely on biomass energy sources, primarily fuelwood, dung, and crop residue, for their energy needs. Widespread poverty in many rural areas of developing countries, especially Sub-Saharan Africa, is a critical factor in continued dependency on biomass energy sources and persistent traditional and inefficient means of using them. It can be observed across developing countries by the ongoing forest degradation and deforestation, particularly in Asia and Sub-Saharan Africa, which has resulted in fuelwood scarcity.

Increased population and land shortage also contribute to deforestation. Respondents indicated during the focus groups that they travel long distances to get very little fuelwood. Notwithstanding the time spent and energy, these trips are tormenting to women who are always on guard in fear of being attacked by strange men in the forests. This is why 16% of the

respondents indicated that they buy fuelwood and 4% indicated that they sell fuelwood to their neighbors (Table 4.29).

Table 4.19: Sources of energy for lighting, cooking and heating (n=300): Multiple responses

	Lighting	Cooking	Heating
None	-	-	5.3
Electricity from public supply	47.3	55	45
Gas	1	33.3	0.7
Paraffin	5.7	43.3	10.3
Solar panels	0.3	2.3	3
Fuelwood	-	56	47.3
Coal	-	6.3	2.7
Generator	2	1.3	0.7
Candles	87.3	-	-

Table 4.17 shows that more than half of the respondents (55%) depended on electricity for cooking, slightly less than half for lighting (47.3%) and heating (45%). A third of the respondents use gas for cooking (33.3%) with almost no respondents using gas for lighting (1%) and heating (0.7%). Forty three percent of the households use paraffin for cooking, 10.3% for heating and 5.7% for lighting. Solar panels were a source of heating for 3% of the households, 2.3% for cooking and 0.3% for lighting. Some of the respondents use coal for cooking (6.3%) and heating (2.7%). A few respondents (4%) indicated that they use generators for lighting (2%), cooking (1.3%) and heating (0.7%). Almost all of the respondents (87.3%) use candles for lighting and none for heating and lighting. Most of the sources of energy are non-renewable and contribute to indoor air pollution which negative impacts on health and well-being of household members and is also unsustainable.

Mestle et al (2007) state that indoor air pollution from solid fuels, particularly fuelwood and coal, is known to pose a major health risk. Specifically, Larson and Rosen (2002: 571) argue that more than 2 billion people rely on solid fuels (including wood, charcoal, dung, crop residues and coal) and traditional stoves or open fires for cooking, lighting and/ or heating which cause exposure to emissions which is responsible for a significant share of the global burden of

disease”. Thus, they conclude that these fuels which provide direct energy benefits to households also impose a series of health costs. Considering their hazardousness nature through the emission of carbon monoxide, and its sootiness, its not one of the respondents’ preferences (Larson and Rosen, 2002). This was also highlighted during the focus group discussions that there was a preference for electricity (because of its reliability and convenience) and renewable energy sources such as solar energy which was deemed to be affordable. The results also show an unequal distribution in the use of the different energy sources. The respondents’ lifestyles and incomes also determine what they can afford and what they prefer.

4.4. Land use

During the focus group discussions participants were asked about the main uses of land generally and pertaining to communal resources specifically in the community and households. The results are presented in Tables 4.20 and 4.21. Both men and women agreed on a number of issues. Both groups stated that the need for land was critical for agriculture and for building of homes. Land for building cemeteries/ burial places were indicated as very important also. Men in particular were concerned with accessing land for business ventures. Other land uses mentioned included livestock grazing and land to get raw materials for arts and crafts. During the discussions women indicated that poultry was the livestock that they were referring to while men were referring to cattle and goats. Jacobs et al (2011: 2) in corroboration states that –ompared with women, men are more likely to own larger, more valuable animals”.

The main land uses were also identified during the mapping exercises and are illustrated in the relevant participatory maps generated by the two focus groups (see Figures 4.1 and 4.2) As shown on the participatory map, men also identified renting homes, running business ventures such as tuck-shops, dams for fishing, scrap yards for recycling jobs, building homes, cemeteries and block making as important for their livelihood outcomes. An additional activity identified by women only was community gardens. During the discussion it emerged that two of the women participated in a community garden, which had almost all female members from households that reside in close proximity to the garden. Additionally, many of the land uses identified contribute

to land clearing and other negative human-induced land use changes that permanently scar the land and disturb the irreplaceable primary vegetation let alone adjust eco-synergistic systems whose mutuality support tons and tons of life systems which are part of the natural resource base.

Table 4.20: Main ways in which households use land

	Men	Women
Agriculture (sugar cane, forestry and other crops)	X	X
Building of homes	X	X
Creation of cemeteries/ burial	X	X
Renting land / housing	X	-
Business (tuck-shops, shebeen, block making, shops)	X	-
Livestock	X	X
Community garden	-	X
Sports fields for recreation	X	
Raw material for arts and crafts	X	X
Dam for fishing	X	-
Scrap yards	X	-

Jacobs et al (2011: 2) supports the argument raised earlier which views women’s jobs as ~~in~~invisible work’:

Women’s engagement with land and other assets (such as housing, material assets such as farming equipment, or livestock) is not well quantified, and the relative importance of different socio-economic and structural factors contributing to that engagement has generally gone unmeasured.

Tables 4.20 and 4.21 indicate gendered variations in the use of natural resources in KwaDube. These Tables show how both men and women view what the community offers and what they deem as valuable to their personal experiences.

Table 4.21: Use of communal resources

	Men	Women
Community gardens	X	X
Boreholes/ wells	X	X
Dam/ rivers	X	X
Community clinics	X	X
Woodlots/ fuelwood	X	X
Forests/ bush	X	X
Agricultural fields	X	X
Communal pasture	X	-
Community gardens	-	X
Stand pipes	-	X
Recreational grounds	X	-
Storage facility	X	-

Similar trends to land use emerged during both focus groups regarding the use of communal resources specifically in the community. Respondents' views were dictated by what activities they do. For example, women again identified communal gardens where they spend most of their time and standpipes, both of which are primary sources for subsistence production essential for food security, good health and nutrition apart from the collection of water and fuelwood. Men identified recreational grounds and storage facilities, which males use especially for off-farm activities. The results also show that there is a range of resources available in the community. In terms of natural resources specifically, there are forests/ bush and water resources that households use.

Figures 4.1 and 4.2 represent perceptions households have about land use in their environment now and what they anticipate it to be. During these focus group discussions, a wide range of mapping exercises was facilitated including resource and land use mapping. In this exercise respondents discussed the current land uses and they also discussed the changes they would like to see in the next five years. The land uses identified included various uses of residential land. Respondents gave examples of different types of housing such as low-income housing, traditional/ chief areas, middle-income housing and informal settlements and agricultural plots of which community gardens and commercial farms are included. Respondents also identified open

access areas (including forests), municipal/ state land (for offices, community halls, clinics, schools, etc.), shopping malls and other business sites, recreational areas (sports fields), sewerage/ waste facilities, religious/ church land, NGO land and heritage/ tourism sites. Additionally, a range of built up (such as roads, railways, quarries, etc.) and natural areas (such as dams, rivers, coastline, forests, etc.) were identified.

Figure 4.1: The perceptions participants have in relation to current land use and future land use in KwaDube (Only the base features are to scale) (Generated by Humayrah Bassa)

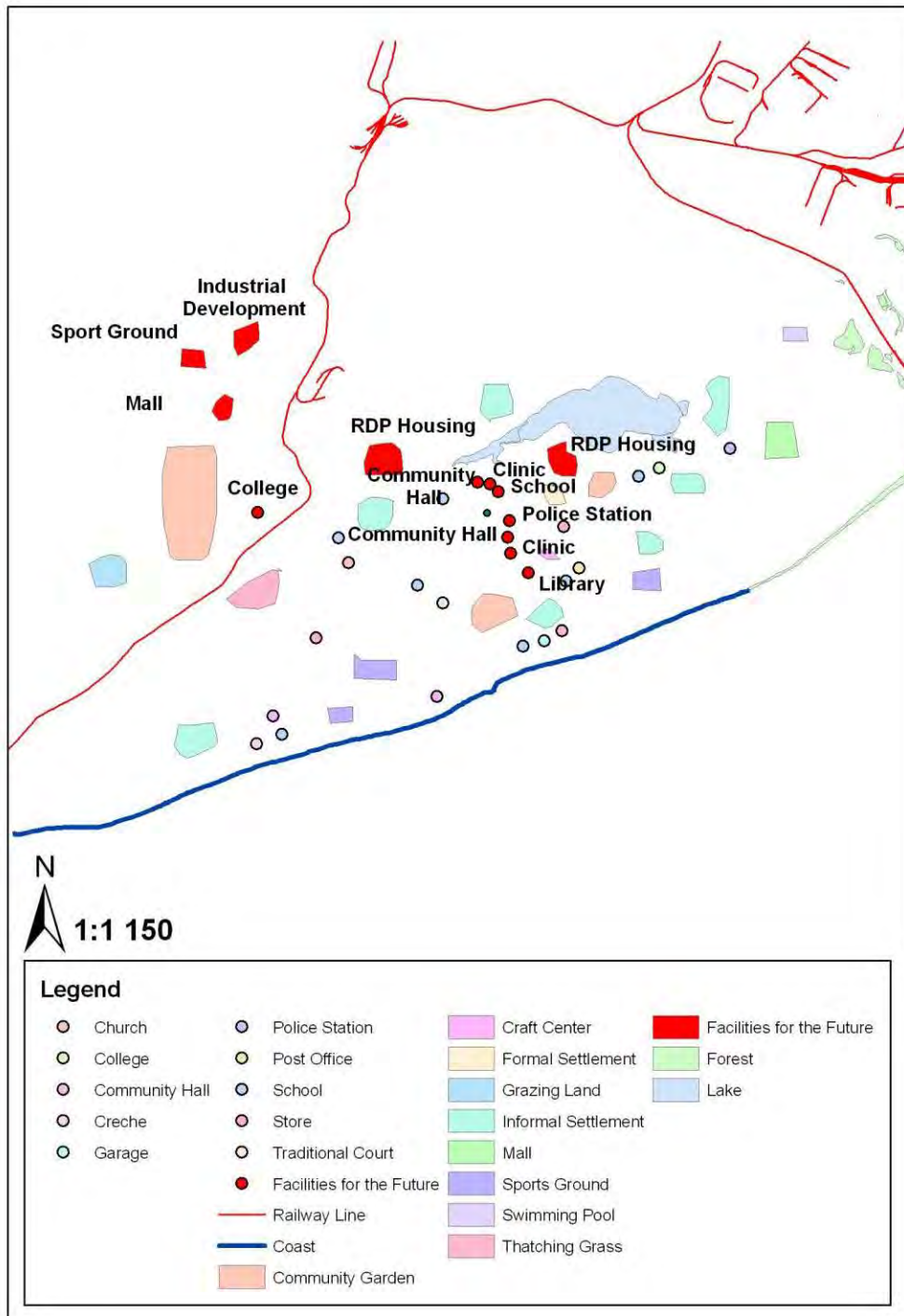
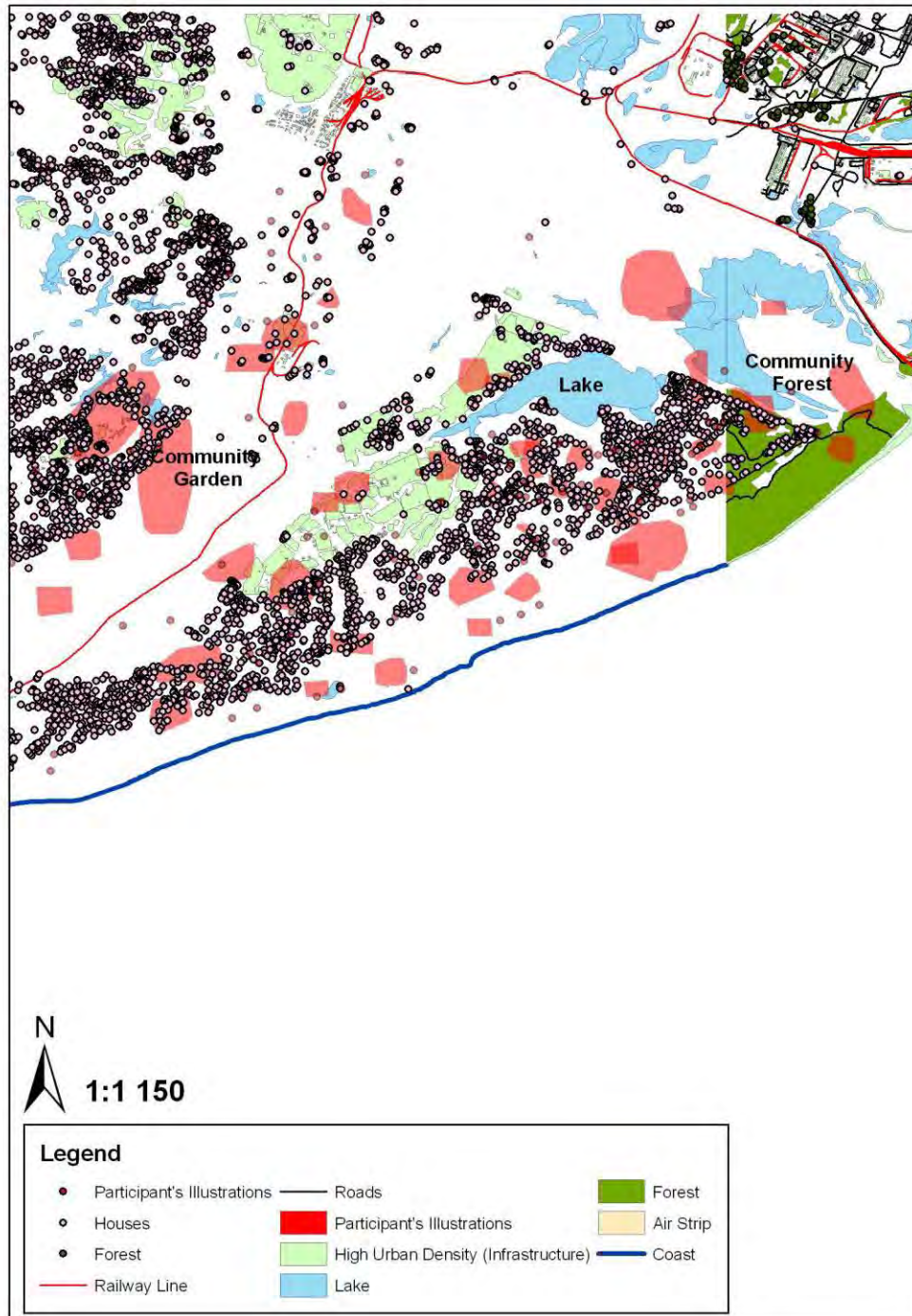


Figure 4.2: Actual land use compared to participant's perceptions of land use depicted in red (Only the base features are to scale) (Generated by Humayrah Bassa)



In terms of current land use, the responses were compared to actual base maps generated from orthophotos and aerial photographs. There were significant differences in the ways in which different groups see the landscape and in some cases what the current land use actually is. In relation to the latter, this relates to perceptions regarding what individuals or groups believe is occurring which they have not verified themselves. Clearly, people place more emphasis and provide information more closely related to reality on land use that they are familiar with and actually use or participate in. The future maps highlighted the need for improved infrastructure and for land to be allocated for housing and agricultural production.

The respondents indicated that they are involved with the growing of at least one crop alongside the rearing of livestock (see Tables 4.22 and 4.23) Most households practiced mixed farming in order to reduce risk. The main subsistence crops are maize (43.7%) and beans (40.7%) followed by *madumbes* (a local tuber starchy crop) (38%), spinach (33%) and squash (27.3%). Households raise cattle (39%) as the main big livestock, followed by goats (28%). Cattle traditionally serve many socio-economic purposes some of which include bride-price (*amalobolo*) or as a source of food on wedding days and other traditional ceremonies.

Table 4.22: Main crop production (n = 300, yes responses only)

	Frequency	Percentage
Grew at least 1 crop during the last season	192	64
Grew maize	131	43.7
Grew beans	122	40.7
Grew pumpkin/squash	82	27.3
Grew spinach	99	33
Madumbes	116	38.7

The Global Development Program (GDP) (2011: 10) states that it “is estimated that nearly three-quarters of the world’s rural poor rely on livestock to meet their basic food and income needs”. Households depend on livestock for beef, milk and eggs. These animals and their by-products often provide the nutrition needed by households. These animals are also a source of income,

especially in times of shock and stress. Upton (2004: ii) gives a synopsis of the general value of livestock, especially to a rural economy such as that of KwaDube:

Animals are a source of food, more specifically proteins for human diets, income, employment and possibly foreign exchange. For low-income producers, livestock can serve as a store of wealth; provide draught power and organic fertilizer for crop production and as a means of transport.

KwaDube households experience all these advantages that come with owning livestock. The only dilemma is that for most households it can be difficult to buy the first few beasts, as highlighted during the focus group discussions, especially cattle because they cost a lot, not only in this community but also in most parts of SSA. Table 4.29 shows that 1% of the respondents purchased grazing land for the cattle and 0.7 of the respondents purchased fodder/ feed for their cattle. Often times feeding the livestock can be a challenge in dry climates or overpopulated areas where there is pressure on resources on shared property. Table 4.28 shows that 2% of the respondents graze their cattle on private property, 3% on public property in the area and 0.7% on public property that is more than 5 km away.

Table 4.23 shows that 13% of the respondents own cattle, 9.3% goats, 37.7% poultry and 0.3% pigs. This is supported by the literature that indicates that three main forms of livestock most households keep are chickens, goats and cows (GDP, 2011: 10). According to GDP (2011: 10), poor women in Africa generate income through rearing of chicken since it is regarded ~~as~~ the lowest at the bottom of the livestock ladder". GDP (2011: 10) explains that this is so because chickens are inexpensive to breed, feed and house. Their simple breeding mechanism makes them multiply very fast and bring a quick turnover to the owners. Households in KwaDube indicated during the focus groups that they feed their chicken from waste grains that accumulate during harvest times and also sometimes food wastes from their kitchens. Goats are also preferred by many farmers in many parts of the world because they are also regarded as low maintenance yet they can still provide what the cows do, which is meat, milk and it can be used for ceremonial purposes as well as pay school fees for the children and even health care. Yet, goats are comparatively less expensive than cattle.

However, Swanepoel et al (2010: 3) state that “in order to support the enhancement of the multi-functionality of livestock”, communities have to keep up to date with innovative and livestock rearing trends and drivers and most importantly, knowledge on environmental consequences of rearing livestock. They indicate that livestock have an (Swanepoel et al 2010: 3):

...important function in sustainable land use and, in fact, can have both positive and negative environmental impacts, especially due to the rapidly evolving livestock systems. Thus, it is important to increase the understanding of livestock’s effect on the environment and undertake the management needed to achieve sustainable use and development of resources.

This is particularly true because livestock in themselves can be very destructive as their foraging and feeding habits contribute to devastation of extensive grasslands (Dwyer, 2009). Sheep and goats in particular are considered adaptable heavy grazers that can survive on a variety of vegetative species. They are known to uproot grass during grazing as opposed to chewing off the grass tops; they also devour thick layers of undergrowth, diminishing the capacity for regrowth (Dwyer, 2009).

Table 4.23: Ownership of livestock (n=300, yes responses only)

	Frequency	Percentage
Poultry	113	37.7
Cattle	39	13
Goat	28	9.3
Pig	1	0.3
Ox	2	0.7

4.5. Natural resource use

Table 4.24 shows that there is a wide range of natural resources used in KwaDube. Twenty-eight in total were identified and this is an indication of a natural resource rich community. Land for crop production was identified by most of the respondents (65.7%). The discussion in chapter 2 indicates that many rural households are agrarian. This means their livelihoods are dependent on

the land for crop cultivation, especially in gardens. The resources commonly used include those for basic needs such as food, shelter and warmth.

The majority of KwaDube households (65.7%) indicated that they used land more frequently against 34.3% who did not. Households also depend on wild herbs and spinach (58%), wild fruits (51%), firewood (48.3%), sand / mud (48%), stone for construction (42.3%), medicinal plants (31.7%) mushrooms (25.7), clay (18.7%), seeds (17.3%), thatch grass (12.7%) and wild animals for food (12%). One percent to 9.3% of the households depend on other resources such as water from lakes and boreholes, twigs, wood for carvings, wood for furniture, insects for food, reeds, plant resins, plant dyes. Both the frequently used and less frequently used resources shown on Table 4.24 are all critical to the socio-economic structure of KwaDube.

Table 4.24: Different natural resources used by households in KwaDube

Resource	Natural resource used by the household (n = 300)			
	Yes		No	
	Frequency	%	Frequency	%
Fuelwood	168	56	132	44
Wood for household construction (e.g. poles)	145	48.3	155	51.7
Wood for household items (e.g. spoons, axe, etc)	79	26.3	221	73.7
Wood for furniture	28	9.3	272	90.7
Wood for carvings	19	6.3	281	93.7
Wild herbs/spinach	174	58	126	42
Medicinal plants (muthi plants)	95	31.7	205	68.3
Wild fruits	153	51	147	49
Mushrooms	77	25.7	223	74.3
Honey	49	16.3	251	83.7
Insects for food	5	1.7	295	98.3
Wild animals for food	36	12	264	88
Birds eggs	25	8.3	275	91.7
Thatch grass	38	12.7	262	87.3
Reeds	24	8	276	92
Grass for livestock	22	7.3	278	92.7
Tree leaves for livestock	8	2.7	292	97.3
Plant dyes	3	1	297	99
Plant resins	9	3	291	97
Clay	56	18.7	244	81.3
Sand/ mud for construction	144	48	156	52
Twigs	27	9	273	91
Seeds	52	17.3	248	82.7
Stone for construction	127	42.3	173	57.7
Land for grazing	20	6.7	280	93.3
Water from lake	12	4	288	96
Water from boreholes	18	6	282	94
Land for crop production	197	65.7	203	34.3

Transportation is a necessary aspect of people's livelihoods. It is a critical factor in determining availability and accessibility of natural resources to households in KwaDube. The DFID (2005) states that availability or unavailability of transport also determines allocation of time to other activities as well as quantities of resources harvested and opportunities for trade. The majority of respondents between 42% and 99.3% did not indicate any response to the mode of transportation they used. Table 4.25 below shows that 60% walk to get to land for crop production, 54% to collect wild herbs and spinach, 46.7% walked to collect firewood, 46% wild fruits and 26% walked to collect wild fruits. Less than 20% walk for other resources such as mushrooms, honey,

wood for construction, thatch grass, water from boreholes, wild animals and sand for construction to mention a few.

Wheelbarrows were used in the transportation of resources used for construction such as sand or mud (12.7%) and stone (12.3%). Less than 2% of the respondents use wheelbarrows to transport resources such as wood for household items (1.3%), clay (2.7%), produce from gardens (0.7%), grass for livestock (1.7%), leaves for livestock (1.7%), twigs (0.7%), firewood (0.7%), wild fruit (0.3%), reeds (0.3%) and mushrooms (0.3%).

As shown on Table 4.25, KwaDube households do not heavily depend on bicycles for the transportation of their resources. This is probably because of the limited carrying capacity of bicycles. The following resources are the only ones that are transported using this mode: clay (0.7%), mushrooms (0.7%) and medicinal plants (0.7%). One respondent each stated that households used bicycles to transport sand and stone for construction, honey and wood for fuel and household construction.

A limited number of households used vehicles to transport natural resources such as sand/ mud for construction (25.7%), stone for construction (24.3%), wood for household construction (21.7%), seeds (9.7%), wood for household items (9.3%), fuelwood (7.3%), clay (8.7%) and mushrooms (6.7%). Less than 5% of the households also use vehicles for other resources such as wood for furniture, medicinal plants, wild herbs and spinach, honey, insects, thatch grass, reeds, grass for livestock, leaves for livestock, plant dyes and plant resin. A very small percentage of respondents indicated that they used other modes to transport construction materials such as sand/ mud, stone and wood for household construction. These smaller percentages indicate that very few households own vehicles or can afford to hire vehicles for use in their daily activities.

Table 4.25: Mode of transportation used to access natural resources (n = 300, in %)

Note: NA refers to not applicable and NR indicates no response.

	NA/ NR	Walking	Bicycle	Wheelbarrow	Vehicle	Other
Fuelwood	44	46.7	0.3	1.7	7.3	-
Wood for household construction	51.7	26	0.3	-	21.7	0.3
Wood for household items	73.7	15.7	-	1.3	9.3	-
Wood for furniture	90.7	3.3	-	1	5	-
Wood for carvings	93.7	3	-	0.3	3	-
Wild herbs/spinach	42	54.3	-	0.3	3.3	-
Medicinal plants	69	26.3	0.7	-	4	-
Wild fruits	50.3	46	-	0.3	3.3	-
Mushrooms	74	18.3	0.7	0.3	6.7	-
Honey	84.3	11	0.3	0.3	4	-
Insects for food	98.7	1	-	-	0.3	-
Wild animals for food	87.3	6	1	0.3	5.3	-
Birds eggs	92	2	-	0.3	5.7	-
Thatch grass	88	7.3	-	1.3	3.3	-
Reeds	92.3	4	-	0.3	3.3	-
Grass for livestock	93.3	4.7	-	1.7	0.3	-
Tree leaves for livestock	97.7	1.3	-	0.7	0.3	-
Plant dyes	99.3	0.3	-	-	0.3	-
Plant resins	97.3	1.7	-	-	1	-
Clay	81.3	6.7	0.7	2.7	8.7	-
Sand/ mud for construction	53.7	7.3	0.3	12.7	25.7	0.3
Twigs	91.3	4	-	0.7	4	-
Seeds	83	6.7	-	0.7	9.7	-
Stone for construction	58.3	4.3	0.3	12.3	24.3	0.3
Land for grazing	95.3	4	-	0.3	0.3	-
Water from lake	96	4	-	-	-	-
Water from boreholes	94.7	5.3	-	-	-	-
Land for crop production	36	60	-	0.7	3.3	-

There was no response from the majority of respondents (ranging from 43% to 99%) regarding the time they take to do the activities (Table 4.26). This gives the impression that these activities have become mundane or the amount of time taken collecting resources varies considerably. On average, households take between 8 to 24.9 minutes to harvest resources they need. They spend an average of 21.6 to 24.9 minutes collecting construction materials (sand/ mud, stone, wood and clay), an average of 11.8 to 24.4 minutes collecting food resources (birds eggs, animals for food, insects, honey, mushrooms, wild fruits, medicinal plants and wild fruits, wild herbs and spinach), and an average of about 10.6 to 10.8 minutes collecting water from boreholes and the lake.

Households also spend an average of between 14.7 and 22.2 minutes collecting woody resources (mostly fuelwood) (14.3%).

According to Table 4.26, 10.3% of the respondents take 5 minutes to collect wood, 29.3% take 5 to 15 minutes, 10.7% spend 16 to 30 minutes, 5% take 31 to 45 minutes while only 2% take less than 45 minutes to harvest the same resource. Similar differences could be drawn from the table using any other resource. However, one can infer that different respondents take different lengths of times to collect needed resources. This may mean a variety of things, one of the reasons being that some of the households are closer to resources than others and the type of transport used as discussed earlier. Thus, distance to the resource and how the resource is collected become determining factors in relation to how much time is spent collecting the resource. This also means that the natural resources of KwaDube are not equitably distributed, as shown on Figure 4.2. Lake Chubu, for example, is closer to households located around it and to the east of it more than it is to those households that are further south or west. The home garden perceived to be to the north of the railway line by the respondents on Figure 4.1 may be accessed over a shorter time by households located in close proximity to it compared to those to the west of the railway line than it is for households to the east of the railway line. Availability and accessibility of a resource influence the time factor. However, this does not rule out the human and economic factors too.

There may be a strong correlation between the scarcity of the resource and time taken to collect it. It can be deciphered from Table 4.26 that reeds (24.6 minutes), birds eggs (24.4 minutes), clay (24.9 minutes), sand (24.1 minutes) and stone (24.7 minutes) take the longest to collect.

Table 4.26: Length of time taken to get to natural resources (n = 300, in %)

	NA/NR	< 5 min	5-15 min	16-30 min	31-45 min	> 45 min	Average (in minutes)
Fuelwood	42.7	10.3	29.3	10.7	5	2	14.7
Wood for household construction	53	5	15	11.3	9.3	6.3	21.6
Wood for household items	73.7	3.7	7	8	5.7	2	20.4
Wood for furniture	91	1.3	2.7	1	3.3	0.7	22.2
Wood for carvings	93.3	1.7	2.3	0.7	1.7	0.3	17.8
Wild herbs/spinach	42.7	16.3	29.3	8.3	1.7	1.7	11.8
Medicinal plants	68	9	12.7	6.3	2	2	14.3
Wild fruits	50.3	19.7	22.7	5	1	1.3	10.5
Mushrooms	74.3	5	9.7	5.7	4.7	0.7	16.7
Honey	84.7	3.7	6.3	3.3	1.3	0.7	14.7
Insects for food	98.7	0.7	0.3	-	-	1.3	16.3
Wild animals for food	87.3	1	4	4	1.3	2.3	21.8
Birds eggs	92	-	2.3	2.7	1.7	1.3	24.4
Thatch grass	88	0.7	4.7	4	2	0.7	19.2
Reeds	92.3	0.3	2.7	1.3	1.7	1.7	24.6
Grass for livestock	93	1.3	2.7	2.3	0.7	-	14.8
Tree leaves for livestock	97.3	0.7	1.3	0.3	0.3	2.7	13.1
Plant dyes	99	0.3	0.7	-	-	-	8.3
Plant resins	97	1	1.7	-	-	0.3	12.2
Clay	80.7	1.3	4.7	5.7	3	4.7	24.9
Sand/ mud for construction	53.7	1.3	13	13.7	12	6.3	24.1
Twigs	91.3	2.3	2.7	0.3	2.7	0.7	19.4
Seeds	82.3	3	5.3	3.7	4	1.7	20.2
Stone for construction	58.3	4	6.7	13	12.7	5.3	24.7
Land for grazing	94.7	2.3	1.7	1	0.3	5.3	11.3
Water from lake	96	1.7	1.7	0.3	0.3	-	10.8
Water from boreholes	94.3	3	1.3	1	0.3	-	10.6
Land for crop production	58.3	15	17.7	6	1.7	1.3	11.8

Table 4.27 demonstrates that households frequently harvest natural resources. The frequency ranges from less than once a day to once a year. The three main resources that are harvested much more than others cutting across the board are land for crop production, fuelwood and wild herbs and spinach. In less than a day a greater percentage of households (5%) frequent land for

crop production than any other resource. The results indicate that small components of KwaDube are agrarian in nature. However, it is important to note that this group needs to be supported since they are generally the most vulnerable and are likely to struggle to access off-farm income. Households also frequently collect fuelwood (1.7%). This is because fuelwood is one of the main sources of energy for cooking and heating (see Table 4.17). A greater percentage (23.3%) of the households frequently collect wild herbs and spinach weekly as well as on a monthly basis (16%).

The least of their time (1%) is taken getting wood for furniture (men); collecting insects, thatch grass, clay, twigs, wood for carvings, birds eggs, tree leaves for livestock and plant dyes; collecting water from the lake as well as finding land for grazing (less than 1%). Collection of fuelwood (21%) stands out among other monthly activities. This is because they need wood almost on a daily basis for food preparation. Considering that they travel long distances to get the wood from public places (46%) it means a lot of effort and time is put into this activity, especially by women and children who are the main collectors of fuelwood. However, sources of energy identified in Table 4.17 show an increase in the number of respondents that depend on electricity for lighting (47.3%), cooking (55%) and heating (45%). As a result of mass clearing of land for agricultural activities and other development issues, available wood has been gradually diminishing as underscored during the focus group discussions. As such, it is evident in Table 4.29 that some respondents are now resorting to purchasing wood for their daily needs. Income diversification in some families makes it possible to do so.

Table 4.27: Frequency at which the household collects natural resources (n = 300, in %)

	NA/NR	> once a day	Once a day	2-3 times a week	Once a week	Once a month	Once a year
Fuelwood	43.7	1.7	3.3	12.7	14.3	21	3.3
Wood for household construction	52.3	1.3	1	6	6.7	13.3	19.3
Wood for household items	73.3	1.3	0.7	2	2.7	10.7	9.3
Wood for furniture	90	0.3	0.3	0.3	1	3.3	4.7
Wood for carvings	93.7	0.3	0.7	0.3	0.7	1.7	2.7
Wild herbs/spinach	42	1.3	2.3	15	23.3	16	-
Medicinal plants	69.3	0.7	2.3	3.3	5.3	17	2
Wild fruits	50.7	1.3	2.3	12.3	7.3	21.3	4.7
Mushrooms	74.7	0.7	2.3	4.3	6	9	3
Honey	84.3	1	0.7	3	3.3	6.3	1.3
Insects for food	98.7	-	-	0.3	1	-	-
Wild animals for food	88	-	0.3	1.3	2.7	5.7	2
Birds eggs	92	-	-	1.7	0.3	5.7	0.3
Thatch grass	88.3	-	0.7	2.7	1	4	3.3
Reeds	92	-	0.3	1	1.3	2	3.3
Grass for livestock	93.3	0.3	0.7	3.3	1.7	0.7	-
Tree leaves for livestock	97.3	-	0.7	1.3	0.7	-	-
Plant dyes	99	-	-	-	0.7	0.3	-
Plant resins	97	-	-	-	1.7	0.7	0.7
Clay	80.7	0.3	-	1.3	1	7.3	9.3
Sand/ mud for construction	53.3	0.7	-	1.3	3.3	15.3	26
Twigs	91.3	-	0.7	1.7	1	2	3.3
Seeds	91.3	-	0.3	2.3	3.3	8.3	3
Stone for construction	58.7	0.3	0.3	1.3	1.3	7.3	30.7
Land for grazing	94.7	1	1.3	1.3	0.3	1	0.3
Water from lake	96.3	-	1.7	1	0.7	0.3	-
Water from boreholes	94.3	2.3	0.3	1.3	1.3	0.3	-
Land for crop production	36	5	4.3	16.3	21.3	14.7	2.3

Table 4.28 shows that the majority of the resources are located in public property within the areas where households live with the exception of land for crop production (36.7% in own property as compared to 25% in public property) and wild herbs/ spinach (28.3% in own

property compared to 24.3% in public property). The Table also shows that more resources are collected in the public property within the area than public property more than 5 km away and elsewhere.

A substantial percentage (between 41.7% and 98.7%) of the households did not give a response, however, it can be deciphered from Table 4.28 that of the given responses, land (36.7%), wild herbs/ spinach (28.3%), wild fruits (22%) and medicinal plants (9%) are the leading natural resources⁴ collected by most households in their own property. There are some resources that are not found in the households⁴ own property at all. These include honey, insects, plant dyes, resin, leaves for livestock and water from the lake. Among the natural resource thematic groups, households collect more woody products from the public property than resources in other thematic groups. These are fuelwood (46%), wood for household construction (30%), wood for household items (17%). Grazing land diminishes with distance (3% in public property, 0.7 in public property 5 km away and none elsewhere. Many households harvest sand/ mud (23%), stone (19.3%) and clay (11/7%) in public property areas. Since most of these resources are harvested from public places, and grazing (3%) added to that, it makes the environment vulnerable to destruction because the extractive nature of these resources not only scars or disfigures the land but also stripes of it, its protection. Tragedy of commons is prevalent in such areas as discussed in chapter 2. Households also go further afield to collect food resources (honey - 2.3%, wild animals - 1.7%, seeds - 3.3%, mushrooms – 1%, and wild fruits, medicinal plants, spinach and wild herbs - all at 0.7%) and construction resources (sand - 2.7%, stone - 2%, wood - 1.7%, and thatch grass - 0.3%, to mention a few.

Table 4.28: Locations from which natural resources are collected (n = 300, in %)

	NA/NR	Own property	Public property in the area	Public property more than 5 km away	Elsewhere
Fuelwood	43.3	6.7	46	3.7	0.3
Wood for household construction	52.7	5	30	10.7	1.7
Wood for household items	73.3	2.3	17	7	0.3
Wood for furniture	90.7	0.3	5	4	-
Wood for carvings	94	0.7	3	2.3	-
Wild herbs/spinach	41.7	28.3	24.3	5	0.7
Medicinal plants	69	9.7	17.7	3	0.7
Wild fruits	50.3	22	24	3	0.7
Mushrooms	74.7	4.3	14	6	1
Honey	84.3	-	11.7	1.7	2.3
Insects for food	98.7	-	1	0.3	-
Wild animals for food	87.3	0.3	6.7	4	1.7
Birds eggs	92	0.3	4.7	2.7	0.3
Thatch grass	88.3	1	7.3	3	0.3
Reeds	92.3	1	3.7	2.7	0.3
Grass for livestock	93.3	1.3	5	0.3	-
Tree leaves for livestock	97.3	-	2.7	-	-
Plant dyes	99	-	1	-	-
Plant resins	97	-	2.3	0.3	0.3
Clay	80.7	1	11.7	6	0.7
Sand/ mud for construction	53.3	2.3	23	18.7	2.7
Twigs	91.3	1.7	5.7	1.3	-
Seeds	82.7	1.3	8.7	4	3.3
Stone for construction	58.3	2	19.3	18	2
Land for grazing	94.3	2	3	0.7	-
Water from lake	96	-	3.3	0.7	-
Water from boreholes	94.3	3.3	2.3	-	-
Land for crop production	35.7	36.7	25	1.3	1.3

According to the United Nations (2008: 7), there is increase in the commercialization of agriculture and natural resources in developing nations where the market plays an increasingly important role, (of) linking rural communities (producers and consumers) to the wider economy". KwaDube is participating in this change although on a very small-scale as can be seen on Table 4.29 which shows that the majority (73% to 100%) of the households are not involved in purchasing of resources compared to only a few that do (0 to 26%). In addition, the majority of the resources (88% to 100) are not sold as opposed to a few (0.3% to 4%) that are for sale. A range of between 0.3% and 4% is involved with the sale of 12 natural resources and 0.3% to 6% produce 18 products for sale.

High on the purchase list are wood for household construction (26%), seeds (21.7%), sand/ mud (21.7%), honey (19%), fuelwood (16%), mushrooms (16%) and land (15.7%). The natural resources sold include fuelwood (4%), wild herbs and spinach (3.7%), wood for household items (2.3%), wood for household construction (1.3%) and land for crop production (1.3%). Less than 1% indicated that they sell resources such as land, medicinal plants, wild fruits, honey, woodcarvings, insects, mushrooms and sand/ mud used for construction.

AFRA (2004) provides an example of the households of Dukuduku forest in KwaZulu-Natal who also sell natural resources. AFRA (2004) indicates that this community makes a variety of items which include wooden sculptures, yokes, baskets and mats from the 'inøma' grasses. However, the community has no tenure over the land it occupies and no direct access to forests where they can get the needed resources in order to make these items. In addition, this community is not allowed to sell its products freely on the road to St Lucia, a key ecotourism site in KwaZulu-Natal. Lack of supportive structures to empower such communities and the innumerable problems that exist hinder rural communities from selling resources on a larger scale as part of diversifying livelihoods so as to offset the effects of shocks. For women in particular, the World Development Report (2012: 239) adds that limiting the presence of women in particular markets, "creates barriers to knowledge and learning about women's performance, which in turn reinforces women's lack of access to these markets". This report also adds that excluding women in these trades only serves to perpetuate existing inequalities.

Such constraints could be the reasons why an overwhelming majority of respondents (88.7% to 100%) do not sell their products and 96% to 100% responded no to producing products from the resources they have. Notwithstanding the role of remittances, grants and pensions; the lack of cash flow in most subsistence economies can be a hindrance in purchasing items for home use. It is also important to note that the ability to purchase and sell can depend on the cash flow of a household.

Table 4.29: If household purchases, sells or produces products from natural resources (n = 300, in %)

	Purchase		Sells		Produce products	
	Yes	No	Yes	No	Yes	No
Fuelwood	16	84	4	96	1.3	98.7
Wood for household construction	26	74	1.3	88.7	3.7	96.3
Wood for household items	12	88	2.3	97.7	6	94
Wood for furniture	6.7	93.3	-	100	1.7	98.3
Wood for carvings	3.7	96.3	0.3	99.7	1	99
Wild herbs/spinach	27	73	3.7	96.3	1	99
Medicinal plants	13.3	86.7	1	99	2	98
Wild fruits	15.7	84.3	1	99	0.7	99.3
Mushrooms	16	84	0.3	99.7	-	100
Honey	19	81	0.7	99.3	0.3	99.7
Insects for food	2.3	97.7	0.3	99.7	-	100
Wild animals for food	6.3	93.7	-	100	-	100
Birds eggs	6	94	-	100	-	100
Thatch grass	3	97	-	100	2.7	97.3
Reeds	2.7	97.3	-	100	0.3	99.7
Grass for livestock	0.7	99.3	-	100	-	100
Tree leaves for livestock	0.7	99.3	-	100	-	100
Plant dyes	-	100	-	100	0.3	99.7
Plant resins	0.3	99.7	-	100	0.3	99.7
Clay	12	88	-	100	4	96
Sand/ mud for construction	21.7	78.3	0.3	99.7	1.3	98.7
Twigs	1.3	98.7	-	100	-	100
Seeds	21.7	78.3	-	100	0.7	99.3
Stone for construction	16.7	83.3	-	100	0.3	99.7
Land for grazing	1	99	-	100	-	100
Water from lake	-	100	-	100	-	100
Water from boreholes	-	100	-	100	-	100
Land for crop production	15.7	84.3	1.3	98.7	1.3	98.7

4.6. Impacts of access to natural resources at the community level

Table 4.30 shows respondents perceptions on whether access to specified natural resources brought any positive impacts on different aspects of their their livelihoods. Households believed that access to natural resources had a positive impact on their quality of life in all the five categories. However, each resource had a different impact. In relation to security in old age, the natural resources that were seen by most of the respondents as having a positive impact were land for crop production (58.7%), wild fruits (57.3%), wild herbs and spinach (57.3%), wild animals (56%), wood for construction (56%), wood for furniture (55%), sand/ mud for

construction (54.7%), wood carvings (54.7%), honey (54.3%). The resources least likely to have a positive impact in security at old age were water from boreholes (49.7%), grass for livestock (49.3%), water from the lake (49%), reeds (48.7%), plant resins (47%) and plant dyes (44.7%).

Households also recognized that natural resources played a significant role in providing security in times of economic crises. Households found great value as security in wood for construction (63.3%), land for crop production (63%), wild fruits (60.7) and fuelwood (60.3%). Examples of resources with the least impact on security included the following: seeds (51.7%), thatch grass (51.3%), twigs (51.3%) and grass for livestock (50.3%).

Table 4.30 shows that respondents perceive that natural resources are important in income generation. Among the ones with the greatest impact are land (76%), wild fruits (70.7%), wild herbs and spinach (70%), medicinal plants (69.3%), mushrooms (68.7%), wood for construction (67%), land for grazing (65.3) and honey (65%). Relatively lesser impact was realized from these resources: plant dyes (59%) and clay (58.3%) Otherwise overall, almost all the resources had relatively greater impact in livelihoods as potential sources of income generation. Regarding diversification of income, resources with great impact on the livelihoods of households comprise: land for crop production (70.3%), honey (64.3%), mushroom and wild fruits both at 64%, wood for household construction (63.3%), water from boreholes and wood for furniture both at 60.3%, and lastly, fuelwood and wood for household items, both at 60%. However, resources with lower influence in the same category comprise clay (55%), plant dyes (54%) and plant resin (53.3%), to mention but a few.

In connection with the food security category, all natural resources have some impact on livelihoods some on a more outstanding level and others to a lesser extent. Among the ones with the greatest influence is land for crop production (68.7%), mushrooms (65.3%), wild fruits (64.7%), wild herbs and spinach (62.3%), honey (62%) and medicinal plants (60.7%). Clay (49.7%), water from the lake (49.3%), twigs (49.3%) and grasses for livestock (50.7%) stand out as the resources with lesser impact on food security on households.

All natural resources are very critical to livelihoods of households in various ways. There are some, however, that stand out in all the five categories as more influential to households than others as shown on Table 4.30. These include land, wild herbs and spinach, fuelwood, wood for construction, wild fruits, water from boreholes and mushrooms. The least influential comprise such resources as plant dyes, plant resin and reeds. The most probable reason could be that the latter are rare resources and limited in their abundance. This Table informs us of what KwaDube households view as essential resources to their livelihoods and what their natural asset base ought to have.

Table 4.30: If access to natural resources will positively impact on selected aspects related to quality of life and sustainable livelihoods (n = 300, in %): Yes responses only

	Security in old age	Security in times of economic crises	Options for income generation	Households ability to diversify income	Food security
Fuelwood	53	60.3	65.7	60	53.3
Wood for household construction	56	63.3	67	63.3	51.7
Wood for household items	50	57.7	66.3	60	51
Wood for furniture	55	56	66	60.3	50.7
Wood for carvings	54.7	54.7	62.7	59	52.7
Wild herbs/spinach	57.3	59.3	70	59	62.3
Medicinal plants	52.7	57.7	69.3	58	60.7
Wild fruits	57.3	60.7	70.7	64	64.7
Mushrooms	53	57.3	68.7	64	65.3
Honey	54.3	57	65	64.3	62
Insects for food	50	52.3	61.3	58.7	58.3
Wild animals for food	56	56.3	61.7	59.7	58.7
Birds eggs	51	55	63.3	56.7	56
Thatch grass	51.3	51.3	61.3	56.3	50.3
Reeds	48.7	53	61	57.3	50
Grass for livestock	49.3	50.3		57	48.7
Tree leaves for livestock	51	52.3	61	57.3	50.7
Plant dyes	44.7	52	59	54	50.7
Plant resins	47	52.3	61	53.3	50
Clay	50	54.7	58.3	55	49.7
Sand/ mud for construction	54.7	54.3	60.3	56	51.7
Twigs	52	51.3	62	56.3	49.3
Seeds	52	51.7	61.7	57	52
Stone for construction	52.7	53	61.3	57.7	52.3
Land for grazing	53.7	55	65.3	59	53.3
Water from lake	49	53	61.3	57.3	49.3
Water from boreholes	49.7	55.7	62.3	60.3	56
Land for crop production	58.7	63	76	70.3	68.7

Table 4.31 reveals several advantages and disadvantages of accessing and/ or owning land and natural resources identified by respondents during focus group discussions. The focus groups identified both advantages and disadvantages of accessing land and natural resources within the community. There were both similarities and differences among men and women. Overall, their concerns were centered on security. They indicated that accessing resources allowed them to have a place they can build a home or be able to rent-out a place to others in need. It gave them some sort of security (even female-headed households) just to know that they had the

opportunity to use the land (notwithstanding the poor tenure systems) to grow crops and raise livestock for sustenance; enjoy the forest products biodiversity offers; get water and fuelwood; get appropriate burial places for their dead; and more especially, if they did not have to pay for it, thereby reducing livelihood costs as much as possible. With this in mind it was therefore important to both men and women that environmental knowledge is passed on to future generations. They saw this as a great advantage since their children and great grandchildren would work the land in years to come hence they needed to be properly educated along these lines and be familiar with what their environment offers.

Men in particular saw the use of land as collateral against business ventures such as acquisition of loans in order to start businesses as a great advantage or even selling the land to get money. They echoed this more than women because due the patriarchy, they are better positioned to be involved in trade, besides they also own vehicles that enable them to transport natural resources from point A to B. Some of the women in the focus groups indicated that they were aware that the government was involving KwaDube in programs to improve the status of women and therefore there were opportunities to engage in livelihood practices where their priorities and concerns are likely to be considered. This also includes in particular the issue of female-headed households, which in most cases do not have the same advantages as male-headed ones.

Regarding disadvantages related to accessing and owning natural resources, respondents were concerned with the tenure system that is not secure. As a result, they felt disadvantaged since the municipality and traditional authorities could expropriate land from them as was the case of the Tholwethu community discussed in chapter 2 and earlier in this chapter. They indicated that it costs a lot to buy land and sometimes one would not be able to fully utilize it. It would seem a loss to purchase land, which they would not be able to maintain in the long run or worse still, not have enough tools, equipment, fertilizers as well as the human assets to work the land. Besides, men were not comfortable with renting out their land to women (cultural stigmas) or renting out to households who would later refuse to pay for the land.

Women also indicated that land was a source of family strife due to petty jealousies regarding inheritance and title-ship at the death of the head. This stems from the unclear position of women in inheritance issues, which seem to vary from household to household because of other extenuating circumstances and also that entitlement comes with no documentation most of the time (Jacobs et al, 2011: 9). However, traditionally such land is usually given to the elder son or a male relative in trust since it is assumed that he will see to the welfare of the widowed woman. Women in particular felt disadvantaged by such unfair practices of discrimination in this area as well as just sheer refusal of men to accept women owning land as equal partners. Jacobs et al (2011: 9) confirm this: →women are much less likely than men to own land, even when joint ownership is included, reflecting the persistence of patriarchal patterns of land ownership in South Africa”. As collectors of assets needed for food security, keepers of the homes and caregivers; women struggle with the difficulty of accessing resources, especially travelling long distances to harvest resources in unsafe forests. For women, criminal activity was a major issue and yet for men it was not.

Table 4.31: Advantages and disadvantages of accessing and/ or owning land and natural resources

	Men	Women
Advantages		
Use land for agricultural production	X	X
Build homes (for own use)	X	X
Land/ house can be rented	X	-
Income generating activities/ livelihood activities	X	X
Reduces use of money if able to access fuelwood, water, edible plants, etc., for free	X	X
Burial	X	-
Will allow families headed by women (which are prominent and increasing) to have more security)	-	X
Can be used as collateral to access loans	X	-
Sell land and get money	X	-
Knowledge about the environment that can be passed from one generation to another	X	X
Disadvantages		
Creates hatred and jealousy amongst community members	X	X
Discrimination against women owning land and accessing natural resources	-	X
Increase in crime against those who own property because of jealousy (especially theft of crops and livestock)	X	X
Increase in crime/ illegal activities (such as growing marijuana in the forests)	X	X
Land can be expropriated for development by municipality/ traditional authority	X	-
Can be conflicts over use of land within households amongst children (often when the male head dies and inheritance rules are unclear)	-	X
Land not utilized	X	X
Difficult to access natural resources – need to travel longer distances and sometimes unsafe	-	X
People refuse to pay rent if land/ house owned by women	-	X
Rates/costs too high - risk of losing land if rates not paid	X	-
Needs maintenance	X	X
Lack of labor, tools, equipment and fertilizer to use land	X	X
Need money to purchase land	X	X

4.7. Perceived changes in relation to natural resources in the community

Table 4.32 shows the perceptions households have on whether the natural resources increased, decreased or did not change in quantity in the past 5 years. Households noticed that there was no change in some of the following resources: in plant dyes (87.7%), in grass for livestock (87.3%), plant resin (87 %), water from the lake (86.7%), water from boreholes (86.3%), land for grazing (86.3%), tree leaves for livestock (86.3%), birds eggs (86.3%), twigs (86%), clay (86%), insects for food (85.7%), thatch grass (85.7%), reeds (85.3%), stone for construction (84.7%) and land for crop production. This, however, does not translate to mean that there were enough resources.

A greater decrease in resources was perceived in some of these resources: fuelwood (27%), wood for construction (26.3%), wild fruits (21.3%), wood for household items (19%), wood for furniture (19.3%) and wild herbs and spinach (19.3%), medicinal plants (18.75), mushrooms (18.7%), honey (18%), sand/ mud (17%), wild animals for food (17%), seeds (14.7%), stone for construction (14.3%) as well as land for crop production (14%), among others. A limited percentage (between 0.7% and 2.4%) of the households perceived increases in these resources: seeds (2.7%), land for crop production (1.7%), wood for household construction (2%) and fuelwood (1.7%). Such varied perceptions have implications on what a household sees as its option in overcoming shocks and stressors.

Table 4.32: Perceived change in natural resource quantity in the last 5 years (n = 300, in %)

	Increased	Decreased	No change
Fuelwood	1.7	27	71.3
Wood for household construction	2	26.3	71.7
Wood for household items	1	19.7	79.3
Wood for furniture	1	19.3	79.7
Wood for carvings	0.7	17.3	82
Wild herbs/spinach	3	19.3	77.7
Medicinal plants	1.7	18.7	79.7
Wild fruits	2	21.3	56.7
Mushrooms	2	18.7	79.3
Honey	2	18	80
Insects for food	1.3	13	85.7
Wild animals for food	1.3	17	81.7
Birds eggs	0.7	13	86.3
Thatch grass	1.7	12.7	85.7
Reeds	0.7	14	85.3
Grass for livestock	1	11.7	87.3
Tree leaves for livestock	0.7	13	86.3
Plant dyes	0.7	11.7	87.7
Plant resins	0.7	12.3	87
Clay	1	13	86
Sand/ mud for construction	1.3	17	81.7
Twigs	1.3	12.7	86
Seeds	2.4	14.7	83
Stone for construction	1	14.3	84.7
Land for grazing	0.7	13	86.3
Water from lake	1	12.3	86.7
Water from boreholes	1.3	12.3	86.3
Land for crop production	1.7	14	84.3

Although both men and women are aware that there is a negative change in the quantity and quality of the resources, the majority could not forward reasons for this. This is evident in Table 4.33. It shows that a high percentage (71.7% to 88.3%) did not give a response at all and between 0.7% and 2.7% did not know why there were changes in the quantity of natural resources. This again is closely linked to the argument that low levels of education imply little is understood about the ecosystem functions relating especially to cause and effect processes. Greater use of resources was perceived as the reason for the change in these main resources: fuelwood (21.3%), wood for construction (20%), wood for household items (15.3%), wood for furniture, medicinal

plants (12%), and wild herbs and spinach (11%). Lesser impact was noticed in resources such as plat dyes (5.3%), twigs (5.7%), grass for livestock (5.7%) and land for crop production (6%).

Respondents also associated the changes in the quality of resources with seasonal/ climatic variations. The greater impact was felt on wild fruits (6.7%), mushrooms (6.3%), wild herbs and spinach (6%), land for crop production (5%), honey (4%) and seeds (4%). Table 4.33 also shows that the least impact (1%) was felt in stone and sand/ mud for construction. Urbanization was perceived as responsible for changes (2% to 3%) in all the 28 natural resources. A few respondents (2.7%) identified erosion as the cause for the changes. Their responses indicate that impacts were felt on changes in sand/ mud for construction (2.7%), wood for construction (1.3%) and twigs (1.3%) and the least impacts (0.3%) were felt on wood for furniture, insects for food, wild animals for food, birds eggs, tree leaves for livestock, water from the lake and plant resins.

Table 4.33: Reasons for the changes in quantity of natural resources (n = 300, in %)

	NA/ NR	Don't know	Greater use of resources	Erosion	Seasonal/ climatic variations	Urbanization and development
Fuelwood	72	2.3	21.3	-	2.3	2
Wood for household construction	71.7	2.7	20	1.3	2.3	2
Wood for household items	79.3	1.7	15.3	-	1.7	2
Wood for furniture	80.3	1.3	14	0.3	2	2
Wood for carvings	82.3	1	12.7	-	2	2
Wild herbs/spinach	78.7	2.3	11	-	6	2
Medicinal plants	80	2.3	12	-	3.7	2
Wild fruits	77.7	2.7	10.3	0.7	6.7	2
Mushrooms	80.3	2.3	9	-	6.3	2
Honey	81	3.3	9	-	4.7	2
Insects for food	86.7	2.3	6.7	0.3	2	2
Wild animals for food	82.3	2	10.3	0.3	2.7	2.3
Birds eggs	87.3	2	6.3	0.3	1.7	2.3
Thatch grass	86.7	1.3	6.7	-	3	2.3
Reeds	86	1.3	8.3	0.7	1.3	2.3
Grass for livestock	88.3	0.7	5.7	1	2	2.3
Tree leaves for livestock	87.3	0.7	6.7	0.3	2.7	2.3
Plant dyes	88.3	0.7	5.3	1	2.3	2.3
Plant resins	87.3	1	6.3	0.3	2.7	2.3
Clay	86	1.3	7.7	0.7	1.7	2.7
Sand/ mud for construction	82.3	1	10.3	2.7	1	2.7
Twigs	86.7	2	5.7	1.3	1.7	2.7
Seeds	83.7	2	7	0.7	4	2.7
Stone for construction	85	1.3	8.7	1	1	3
Land for grazing	86.7	1.7	6.7	1	1.3	2.7
Water from lake	87	1.3	7.3	0.3	1.3	2.7
Water from boreholes	86.7	1.3	6.7	1	1.3	3
Land for crop production	84.3	0.7	6	1	5	3

4.8. Problems in the community and household in relation to accessing natural resources

Focus groups were asked to outline the most important problems in the community in relation to accessing natural resources. From these problems, the groups selected the ten most important problems. Once this was done a ranking exercise was undertaken using a ranking matrix. Tables 4.34, 4.35 and 4.36 below display the problems identified by all the focus groups to see if there were any similarities or major differences. In this exercise both men and women identified scored and ranked challenges pertaining to ownership and livelihood outcomes they engaged in. Decrease in natural resource was scored by both men and women similarly with men scoring it

12 while women scored it 11 (a negligible difference of 1). They both ranked it 1, which implies it is the greatest challenge for both men and women in KwaDube. Men who own livestock, vehicles and land ranked highly issues related to the use of these properties. For example, they ranked lack of infrastructure as 2, destruction of forests for livestock grazing as well as erosion and degradation as 3. During the discussion it emerged that the destruction of forests was seen as being a result of other activities such as mining in the area and not grazing. Thus, respondents did not perceive their activities as being unsustainable. Therefore, attention given to addressing these issues is critical to them as it would facilitate and sustain their livelihoods. Women on other hand ranked lack of infrastructure as 7, destruction of forests and livestock grazing as 9 and soil erosion as 10. This is because these are not women's main areas of concern.

Women who are tasked with food security for the household and are largely responsible for the collection of resources ranked distance to access resources as 2 because they spend hours walking and would therefore want such an issue addressed. The tasks women carry out impact on their health, therefore health concerns are ranked highly (3) while on the other hand men do not even have any scoring for it. The same applies in relation to the dumping of wastes in the bushes, women scored it 7 and it was ranked 4 because they face that challenge of waste that pollutes the resources they harvest. Women regard security issues as important when they are accessing resources, so they ranked this as an important issue (5) while men ranked it as 10. What men mean as security may be different from what women perceive it to be. In this case women may be concerned with issues of being abused by men in the forests as they collect resources (stated repeatedly during the focus groups) and yet men may be referring to the security of their homes so that their livestock may not be stolen.

Table 4.34: Ranking exercise – men’s focus group

	DNR	DAR	QS	ELD	HWT	LI	MRD	WP	DW	SI	BC	DFL	F
DNR		DNR	DNR	DNR	DNR	DNR	DNR	DNR	DNR	DNR	DNR	DNR	DNR
DAR			DAR	ELD	DAR	LI	MRD	WP	DW	DAR	DAR	DFL	DAR
QS				ELD	QS	LI	MRD	WP	DW	QS	QS	DFL	QS
ELD					ELD	ELD	MRD	ELD	ELD	ELD	ELD	DFL	ELD
HWT						LI	MRD	WP	DW	SI	BC	DFL	HWT
LI							LI	LI	LI	LI	LI	LI	LI
MRD								WP	DW	MRD	MRD	DFL	MRD
WP									DW	WP	WP	DFL	WP
DW										DW	DW	DFL	DW
SI											SI	DFL	SI
BC												F	F
DFL													DFL
F													

Table 4.35: Ranking exercise – women’s focus group

	DNR	DAR	ELD	LI	MRD	WP	DW	HI	SI	DFL	R	F
DNR		DNR	DNR	DNR	DNR	DNR	DNR	DNR	DNR	DNR	DNR	DNR
DAR			DAR	DAR	DAR	DAR	DAR	DAR	DAR	DAR	DAR	DAR
ELD				LI	MRD	WP	DW	HI	SI	ELD	ELD	F
LI					MRD	LI	DW	HI	SI	LI	LI	F
MRD						WP	DW	HI	MRD	ELD	MRD	F
WP							DW	HI	SI	DFL	WP	F
DW								HI	SI	DW	DW	DW
HI									HI	HI	HI	HI
SI										SI	SI	F
DFL											DFL	DFL
R												F
F												

Table 4.36: Ranking and scoring of exercises

	Abbreviations	Men		Women	
		Scoring	Ranking	Scoring	Ranking
Decreasing natural resource base	DNR	12	1	11	1
Distance to access resources	DAR	5	8	10	2
Quality of soil	QS	4	9	-	-
Erosion and land degradation	ELD	9	3	2	10
High water tables	HWT	1	12	-	-
Lack of infrastructure (e.g. roads)	LI	10	2	4	7
More residential development	MRD	7	5	4	7
Water pollution	WP	7	5	3	-
Dumping of waste in forests and bushes	DW	6	7	7	4
Health impacts (associated with carrying fuelwood and water)	HI	-	-	9	3
Security issues	SI	3	10	6	5
Bribes and corruption	BC	1	12	-	-
Destruction of forests for livestock grazing	DFL	9	3	3	9
Restrictions during certain time of the year	R	-	-	0	11
Fencing of certain areas	F	2	11	6	5

4.9. Conclusion

This chapter presented the key findings of this study. It revealed that households are not only male-headed but also child and female-headed. It was deciphered from the data that age, gender, number of dependents, literacy levels, tenure systems and incomes had direct impact on livelihood outcomes as well as perceived advantages and disadvantages of accessing and owning resources. This chapter revealed that KwaDube has 28 key natural resources. It was clear from the analysis of data that these resources were collected mainly from the public space. The common mode of transportation was walking, followed by wheelbarrows. The use of bicycles and vehicles was limited. This chapter also shows that these resources had positive impacts on livelihoods as security in old age, security in times of crises, giving households options for income generation and the ability to diversify as a strategy to cope with shocks, and for food security. Resources with the greatest impact included land for crop production, wild herbs and spinach, fuelwood, wood for construction, wild fruits, water from boreholes and mushrooms. The least influential natural resources comprise plant dyes, plant resin and reeds. The data also demonstrated the gendered nature of challenges men and women face in resource extraction that

may be similar in nature but ranked differently. The next chapter synthesizes findings from this study and offers policy recommendations.

CHAPTER FIVE

CONCLUSION

5.1 Introduction

Through the use of both primary (empirical) data and secondary (supportive) data, this research was able to collect evidence used to describe the natural resource asset base in KwaDube. These findings answer the questions in chapter 1 and also fulfill the demands of the objectives of the project. It also makes policy recommendations and suggestions for further research. It is hoped that the livelihoods of current KwaDube households will be improved and there will be promotion/ advocacy for sustainable living which calls for a healthy ecological balance between people and nature such that lives (both animal and people) can be sustained well into the future.

5.2 Key research findings

This section summarizes the key findings of the research in relation to the formulated objectives presented in chapter 1. The issues pertaining the natural resource asset base is centralized.

5.2.1 Natural resources and the overall socio-economic profile of KwaDube

In terms of the socio-economic profiles of households in KwaDube, the majority of the respondents were males who were 46-55 years old. The respondents also had relatively low educational levels, attributed mainly to past inequalities in the provision of educational services. The emergence of child-headed households and the challenges that HIV/AIDS presents were evident in the findings. Households engaged in a range of survival and/ or income generating activities which is characteristic of poorer rural communities. Where income was earned, these were relatively low. It is important to note, however, that unemployment remains a major concern in the community. The reliance on grants and remittances was also noticeable and is also reflective of the poverty levels in the community.

In terms of household profiles, the average size of the households was 4.6. There was some confusion pertaining to tenure type since this is a traditional area and some of the respondents

stated that their properties were freehold. This may be more reflective of attitudes towards tenure security rather than the tenure type. Most households did indicate that the land tenure type were either PTOs or customary. The role of the traditional authority in the areas was deemed to be strong. Most households have lived in the area for 20 years or less, suggesting that they is some level of mobility or growth in KwaDube. Most respondents felt that their property values had increased or remained unchanged in the last 5 years. The housing structures were generally traditional and/ or stand alone brick structures. The main floor structure was mud while iron and zinc roofs were the main roof structures. Most households had pit latrines or VIP toilets. The main water supply taps either in the dwelling or on site. The main energy sources were electricity from public supply, fuelwood and/ or paraffin. The results reinforce the poverty levels in the community although it is clear that many households are investing in the homes and service provision has improved.

This research revealed that both rural and peri-urban households of KwaDube are contributing directly and indirectly to the economy of KwaDube and KwaZulu Natal. In relation to this objective, the results show that some households survive through their provision of cheap labor. Incomes are very low and only received by a handful who get the opportunity to acquire formal jobs due to their better educational qualifications. The households' involvement with tourism is mostly as suppliers of precious wares (made using natural resources). The handmade wares are purchased for very little by middle men who later on sell them at higher prices in higher markets or sold directly by tourists earning very meager benefits. Men in particular are employed in the game parks but for very little. There is evidence though of small-scale businesses mostly carried out by men.

As observed later in this chapter, research points out that KwaDube men have more access to vehicles than women. This makes them flexible to engage in non-farm activities more than women and children. Their livelihoods are no longer fixed on the land. They are also able to reach resources from far regions and can also carry products for small business far afield. However, because their natural resources asset base is small, these men (and even households in

general) spend what they earn from these small businesses on food and clothes or some other need such as school fees for the children. Most of them are not able to have savings at all which diminishes their investment power. Very few households receive supplemental income as shown in chapter four so there is great need in most households for job opportunities.

5.2.2 KwaDube's key natural resource assets and links to livelihoods

With regards to objective one, research data shows that KwaDube households depend on 28 different types natural resources for their livelihoods. Table 5.1 shows an inventory of these resources. These natural resources make up the natural resource asset base of this community. Households use these resources mainly for subsistence and secondarily for trade.

Table 5.1: KwaDube natural resource inventory

Fuelwood	Thatch grass
Wood for household construction	Reeds
Wood for household items	Grass for livestock
Wood for furniture	Tree leaves for livestock
Wood for carvings	Plant dyes
Wild herbs/spinach	Plant resins
Medicinal plants	Clay
Wild fruits	Sand/ mud for construction
Mushrooms	Twigs
Honey	Seeds
Insects for food	Stone for construction
Wild animals for food	Land for grazing
Birds eggs	Water from lake
Land for crop production	Water from boreholes

In Table 5.2, the natural resources of KwaDube are put in seven themes which comprise those resources that are used for agricultural activities, for fuel, for food, water, medicine, materials for construction and for crafts. Both Tables 5.1 and 5.2 at a glance, give an idea of the nature of KwaDube household activities (livelihood outcomes) and how they use their natural resources.

Table 5.2: KwaDube natural resource themes

Theme/ Group	Resource
Agricultural activities	Land for crops, land for grazing, grass and leaves for livestock
Fuel	Fuelwood, twigs
Food	Honey, wild animals, insects, mushrooms, seeds, wild fruits, wild herbs, birds eggs, wild spinach
Water	Water from the lake, water from boreholes
Medicine	Medicinal plants
Materials for construction	Wood for furniture and construction, clay, sand and mud for construction, reeds, thatch grass, water
Crafts	Plant dyes, plant resins, wood for crafts, wood for household items

Households harvest the majority of the resources from public property. Some households collect/ use resources from their own property. Resources from public property include land for crop production, wild herbs, wild fruits, medicinal plants and wood for household items to mention a few. Research indicates that KwaDube households collect an insignificant amount of natural resources from locations elsewhere. The frequency of harvesting these resources varies from one day to about a year. Some of the resources collected daily include fuelwood, water from boreholes, wild herbs, wood for construction, medicinal plants, honey and mushrooms. Households have access to land for crop production and grazing daily throughout the year. All woody resources, construction resources, and food resources such as wild fruits and medicinal plants are also collected throughout the year. Households take an average of between 10.6 minutes and 24.9 minutes to collect various resources. It takes longer though (between 20 minutes and 24.9 minutes) to collect rare resources such as reeds, birds eggs, clay and wood for furniture.

Households mainly walk to collect/ use the majority of their resources. Households also use wheelbarrows, bicycles and in some cases vehicles. The literature in chapter 2 indicates that men have more access to vehicles than women so they have the ability to collect resources from far locations and also take products made from resources to further markets. Research shows that a small percentage of the households sell 12 of the natural resources for a living. On the other

hand, households purchase resources. These include resources from all resource thematic groups (Table 5.2) except for a few which include water from boreholes and lakes as well as plant resin.

This research established that natural resources have a positive impact in households' livelihoods in the following areas: for security at old age, for security in times of crisis, for food security, and providing options for income generation and the ability to diversify income. In all these five categories most respondents cited land as the natural resource with the most impact, and plant dyes and resin has the least impact. They indicated that owning land was an advantage because they would be able to collect resources out of it, use it for agriculture, use it as collateral in small businesses, use it for income generating activities, use it as a laboratory to teach future generations about livelihoods as well as for burial purposes. An insignificant number of respondents believed there was increase in natural resources in the past five years, whereas the majority (87.3%) perceived there was no change. Households believed that seasonal variations in climate and the increased use of resources caused most of the changes.

5.2.3 Power dynamics and resource challenges in KwaDube

Concerning objective two, research points out that households of KwaDube have limited control and access to the natural resources in their community. Resources are gendered. The domination of males in the socio-cultural spheres of households is prevalent. This issue of patriarchy inherent in African communities contributes to skewed power dynamics. While this is a social concern, this research found out that patriarchy has direct consequences on natural resource acquisition and use. It has brought challenges to female-headed families in particular. Even in situations where both men and women share the same common pool of resources, they possess different resources both in type and quantity. A typical example noted in this study is how difficult it is for women to acquire land yet men can and do own property due to cultural entitlements.

This research noted that the challenges of resource accessibility and use are highly gendered. The literature review section outlined that women are responsible for food security on top of other

household chores associated with their socially prescribed roles of child bearing and caregiving. They also attend to crops; weeding and harvesting more than men in some instances. Women are therefore more vulnerable. The effects of HIV/AIDs have made the position of most women overwhelming. As a result most women identified health challenges as one of their concerns that they ranked highly. They also ranked high the challenge of long distances they travel to collect resources, the dumping of waste in public areas where they collect resources and security. Men who own land, vehicles and larger livestock were mainly concerned with challenges such the destruction of forests, poor grazing land and poor infrastructure. Both men and women, however, identified the general destruction of natural resources as a common challenge and ranked it as their greatest priority.

Households face other numerous challenges that highlight their inability to have adequate resources. There is generally very little if any ownership of private property. It is important to also note that the results indicate that there is confusion or lack of knowledge in relation to different land ownership types, including the advantages and disadvantages of different types. The available natural resources such as land, forests and water are public property and are degraded. There are inadequate laws protecting use of public property hence households find themselves exposed to over-consumed natural resources associated with the tragedy of the commons. Diminishing resources mean households continue to struggle to build strong natural resource asset bases. Households struggle to get daily needs met as evidenced by more time spent gathering resources needed for meals such as fuelwood for cooking, water and wild spinach. Food insecurity is a great concern for many. This is an indicator of poverty. HIV/AIDS devours the little resources households have, as resources acquired are channeled towards the purchase of medication and getting nutrition supplies.

Low educational levels are still prevalent in KwaDube despite the availability of adult literacy classes. This puts an insurmountable pressure on households, as they have to work the land more to survive. Most households are limited in their ability to take on better salaried formal jobs as an off-farm employment to diversify income in times of shocks because of this. The outmigration of

men (although it can benefit the household financially) implies reduced personpower to work the land. The low natural resource asset base of KwaDube is not only an environmental challenge, it is a life challenge. Nonetheless households have opportunities they can utilize to cope with the challenges of accessing natural resources. These are discussed next.

5.2.4 Coping mechanisms and future strategies

In connection with the third objective, households' control over natural resources is from limited to none. This challenge to natural resource control and accessibility is a result of the continuity of Apartheid policies and traditional/ patriarchal arrangements that provided access to resources according to race and gender, respectively. The meager natural resources households have force households to adopt livelihood strategies that are survivalist in nature. Low productivity has forced most young men to seek jobs elsewhere, diversifying their income by engaging in off-farm employment, more households engage in petty trade using some of the natural resources in KwaDube such as fuelwood, land for crop production, wild fruits, wild herbs and spinach, fuelwood and products produced from these resources some of which are crafts and items for home use. The money from such trades is used by households to buy foodstuff and is also used for other basic needs. Women also engage in small poultry and garden projects which allows them to earn extra income.

Some households depend on social grants such as the disability grant, HIV/AIDS grant, and child-care grant. Households also receive pensions and remittances. This research established that less than half of KwaDube receive any one of these extra incomes. The incomes are very limited and vary in size and availability among households. Overall, the incomes vary from none to R16 000 per year.

5.3 Recommendations

While this research provides information on the natural resources used by the KwaDube households, its parameters was limited, it points to the availability, accessibility and use of these resources itemized in Table 5.1, but does not delve into a thorough examination of the quality of the natural resources per se. Since there is suggestion from the surveys that climatic data of KwaDube indicates that it has seasonal rainfall, it is important that further research be carried out to determine the possibility of variations in natural resource endowment that are also seasonal. This provides opportunities for further research that that can also provide new insights into seasonal challenges that may have been an oversight during this study. So a cross-study or survey may be done to substantiate these results.

Furthermore, due to the fact that KwaDube is characterized by different land uses, it is critical for research to get into the down-stream effects of industries that are operational; especially those that are geographically in juxtaposition with the area under study. Examples of these include sugar cane growing prevalent in the locality, refuse and waste disposal (especially of toxic waste) from neighboring industrial complexes and urban areas, the running of tourist industries near KwaDube and their impacts on the quality of resources that KwaDube accesses. Practices like monocultural sugar cane growing in the area, for example, have been known to cause soil degradation through processes of salinization and acidification which alters the physical, biological and chemical structure of the soil (van Antwerp and Meyer, 1996: 32). Future research should also examine natural resource collection strategies, particularly in respect of the frequent collection of firewood and future sustainability in relation to environmental carrying capacity. Furthermore, research should focus on identifying additional land for grazing to mitigate against concerns pertaining to overstocking.

Additionally, this research points towards the need to establish or strengthen policies that seek to redress resource availability/ accessibility in KwaDube and other neighboring communities with comparable developmental dichotomies. Such policies should be based on substantive knowledge of the existing natural resource asset base and the challenges that KwaDube

households experience in accessing these resources. As has been established in research done especially in relation to poverty alleviation, efforts should be made to involve KwaDube households in policy formulation. Women, because of the precariousness of their position in the community due to cultural biases that delineate them almost as secondary citizens to men, should be particularly involved. Furthermore, future research should include an examination of the amount of time women spend on household chores including the collection and management of natural resources. The collection of natural resources is a time consuming activity and tends to be gendered. This analysis can have important policy implications for women's empowerment, including who should be the targets of rural development and livelihood programs.

This research supports Bunce et al's (2010) assertion that coastal socio-ecological systems (they focus on Tanzania, Mozambique and South Africa in eastern and southern Africa) are subject to a range of environmental, social and economic changes despite being already vulnerable to these multiple stress factors. From a policy perspective, they argue that policies do not address the problems experienced and often worsen the situation on the ground. Therefore, Bunce et al (2010: 485) suggest that "this policy misfit may be remedied by a move towards adaptive forms of governance, and necessitates an explicit focus on building adaptive capacity of the poor and most vulnerable in society". Additionally, policies should encourage and support alternative sustainable livelihoods to increase resilience and lessen the reliance on decreasing natural resources.

Strengthening natural resource tenure (that is, securing rural communities and households' access to and rights over natural resources) is critical. As Gondo and Komuhendo (2011) indicate, given the centrality of land and natural resources to livelihoods, tenure security is a vital component in reducing vulnerability and is deemed to be necessary to secure other human rights, including food security. In fact, according to the FAO (2012), the recognition of this relationship prompted the United Nations Committee on World Food Security to adopt global voluntary standards on tenure that encourages greater equity and equality. Borrini-Feyerabend et al (2004) and Nelson (2012) state that strengthening land tenure and natural resource rights for local

communities can contribute significantly to create new livelihood opportunities, diversify livelihoods and provide much needed resources including income generating opportunities. Nasi et al (2011) argue that access to varied natural resources tend to support diversified livelihoods which reduces risk to climate-related crises (and other forms of stressors) for people dependent on agriculture.

Of particular importance is to improve natural resource management processes. In the first place, the concepts of natural resources and management need to be reconceptualized given their history as highlighted by Berkes (2010: 13):

The term ‘resource’ carries a sense of ‘free goods’, human-centric use and commodification of nature; it can be revised to include the protection of ecosystem services for human well-being. The term ‘management’ implies domination of nature, efficiency, simplification, and expert-knows-best, command-and-control approaches. It similarly needs a makeover to emphasize stewardship, pluralism, collaboration, partnerships and adaptive governance, balancing efficiency objectives against ecological and social objectives.

This is particularly important where traditional and modern natural resource management systems seem to co-exist without clear guidelines and they often tend to contradict each other. Linked to natural resource management practices are which coping strategies are being adopted. Further research is required to ascertain the types of coping strategies and resilience mechanisms used, especially in-built household and community responses despite challenges faced. An examination of indigenous knowledge is also required. These aspects should be incorporated into policies that are geared towards developing appropriate intervention and support strategies. The overuse of ‘free’ is a particularly worrying concern and as the resource base shrinks from demands such as development drivers and population growth (both clearly evident in KwaDube), the need for more effective natural resource management strategies that centralizes the needs and concerns of the local community generally and the more vulnerable groups in particular become paramount. To ensure sustainability, it is important to develop a balance between existing resources and use demands. Furthermore, given the multiple stressors that exist (including climate change and vulnerability) it is important to focus on adaptive management as outlined by

van Wilgen and Biggs (2011). Berkes (2010) states that instead of entrusting resource decision-making to managers and experts, it is important to underscore user participation, public-private partnerships, effective governance, adaptive capacity and different knowledge systems. Rural communities become essential when this shift occurs.

5.4 Concluding remarks

Human survival in any place is dependent on resources. This is particularly true for those communities that have no other source of livelihood other than the available natural resources. KwaDube is typical of such communities that have a low natural resource asset base.

The data on natural resources collected and analyzed, in this chapter, portrays the socio-economic, political and environmental character of KwaDube households as challenging. First, KwaDube is caught up in a dual political structure - modern and traditional. On the one hand, the post-apartheid government has introduced new policies on land tenure, new programs for sustaining the livelihoods of rural populations, and policy initiatives regarding the use of natural resources. The traditional structures are still existing and frequently applied in areas of land tenure decisions and resource allocation. The uneven and often contradictory interactions between these two political structures at times leaves the people of KwaZulu-Natal vulnerable since many land-related and natural resource management issues remain unclear. Second, the asset base of KwaDube, even though it may be diverse, is now diminishing due to overexploitation.

This study established that KwaDube rural households use natural resources mainly for subsistence living and to some extent small businesses, mainly trade in local arts and crafts so as to inject some income into the household. Judging by the households' income levels, the heavy dependence on subsistence agriculture and natural resources as well as testimonials given during the focus group discussions, KwaDube's survival of its households is largely dependent on the heavy utilization of natural resources found in 'the commons'. The 28 natural resources of KwaDube are shared by both animals and people. Harvesting these resources on common

property with very limited private property use is in itself another indicator of poverty. It is therefore evident from the foregoing data analysis that the KwaDube households face numerous limitations in accessing these natural resources. Some of the limiting factors include age, gender, tenure/ ownership, level of literacy, availability of transportation, and availability or lack of other sources of income in the households' asset portfolio. Additionally, in some instances the issue of affordability is also important to note since some are accessing natural resources by purchasing them. All these variables indicate differentiation among households in KwaDube in terms of options they have in meeting their needs and also coping with shocks and stress.

Gender differences in the use of resources affect the priorities men and women make in the utilization of their resources. Both men and women from KwaDube share common desires and also problems. Environmental threats in the form of climatic changes affect both men and women in that they determine the nature and frequency of activities they engage in and how they utilize their natural resources. Facing such environmental challenges that limit natural resource access, Gaugris et al (2006: 97) recommend that new paradigms be set, through a joint effort of all stakeholders to create a balance between the natural and human phenomena. It is critical for government and other stakeholders responsible for the welfare of the KwaDube community to create policies and development procedures that would therefore provide that balance and create adequate access to and equitable distribution of resources. Any conservation and sustainable development strategies should therefore take into account the gendered needs and priorities of KwaDube KwaZulu-Natal households. This would guarantee sustainable livelihoods and development.

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APPENDICES

APPENDIX 1: KWADUBE ASSET QUESTIONNAIRE

SECTION A: DEMOGRAPHICS

TO BE COMPLETED FOR ALL PERSONS LIVING TOGETHER IN THE SAME HOMESTEAD.

A00. Person ID	A01. What is (...)'s age? (Years)	A02. What is (...)'s sex? Male Female	A03. Can (...) read and write in any language? (ask for persons >5) Yes No	A04. Has (...) ever attended school? (If No or Don't know → SKIP to HA15) (ask for persons >5) Yes No DK	A05. (IF YES), what was the highest level (...) attained in school? (ask for persons >5) (Education Codes)	A06. Has (...) ever taken any education or literacy classes for adults? (only for persons ≥ 15) Yes No
01		1 2	1 2	1 2 98		1 2
02		1 2	1 2	1 2 98		1 2
03		1 2	1 2	1 2 98		1 2
04		1 2	1 2	1 2 98		1 2
05		1 2	1 2	1 2 98		1 2
06		1 2	1 2	1 2 98		1 2
07		1 2	1 2	1 2 98		1 2
08		1 2	1 2	1 2 98		1 2
09		1 2	1 2	1 2 98		1 2
10		1 2	1 2	1 2 98		1 2
11		1 2	1 2	1 2 98		1 2
12		1 2	1 2	1 2 98		1 2
A10. Education Codes 00 None 01 Pre-primary 02 ABET 03 Primary 04 Standard 8/Grade 10 05 Standard 10/Grade 12 06 Tertiary (post-matric)						

A11. Grants (Money or in-kind contributions made from ORGANIZATIONS OR INSTITUTIONS)

GRANT letter (For data entry purposes only)	A11 What type of pensions, transfers and grants has the household received in the last 12 months? (If None, 00) (Grant Codes)
A	
B	
C	
D	
E	

A11 Grant Codes						
00 No Grant	02 Private retirement annuity	04 Unemployment insurance	06 Child Support Grant	08 Foster care grant	10 War veterans aid	12 Church/ religious organization
01 Old Age Pension	03 Retirement package	05 Disability grant	07 HIV/AIDS Grant	09 Social relief grant	11 NGO or relief organization	13 Other, Specify: _____

A12. How long have you and your family lived on this property? _____ (years)

A13. In your opinion, have property values in your area increased or decreased in the last 5 years?

01 Increased	02 Decreased	03 No change	04 Do not know
--------------	--------------	--------------	----------------

A14. What is the land tenure type of the homestead?

00 Don't know	01 Freehold	02 Permission to Occupy (PTO)	03 Customary
04 Informally occupied	05 Rented	06 Leasehold	07 Other (specify)

SECTION B: HOUSING STRUCTURE

<p>B01. Which of the following statements best describes your house? <i>(Can observe for current house)</i></p>	<p>01 Dwelling/house or brick structure on separate stand or yard 02 Traditional dwelling/hut/structure of traditional materials 03 Flat 04 Town/cluster/semi-detached house (simplex, duplex or triplex) 05 tenement (muzigo) 06 Dwelling/house/flat/room in backyard 07 Informal dwelling/shack in backyard 08 Informal dwelling/shack NOT in backyard(e.g. in an informal/squatter settlement) 09 Other (specify)</p>
<p>B02. What is the main material used for the floors of your house?</p>	<p>01 Wood 02 Plastic 03 Cardboard 04 Mud / rammed earth 05 Concrete / cement screed 06 Covered concrete (with linoleum) 07 Linoleum 08 Tile 09 Carpet 10 Stone 11 Other</p>
<p>B03. What is the main material used for the roof of your house? <i>(Can observe for current house)</i></p>	<p>01 Cement Block/Concrete 02 Iron/Zinc 03 Wood 04 Plastic 05 Cardboard 06 Mixture of mud and cement 07 Wattle and daub 08 Tile 09 Mud 10 Thatching 11 Asbestos 12 Other</p>
<p>B04. What type of toilet does the residence have?</p>	<p>00 None 01 Flush toilet 02 Chemical toilet 03 Pit latrine 04 VIP latrine 05 Bucket toilet 06 Other</p>

B05 What are the sources of fuel used in the household for cooking, lighting and heating?

Fuel type	Cooking	Lighting	Heating
Wood			
Utility gas/ fuel oil/ kerosene			
Tank or LP gas			
Electricity			
Other (specify)			

B06. What is the household's main water supply?

Tap in dwelling	Tap water on site	Public tap	Communal borehole
Rainwater tank on site	Stream/ river/ dam	Other (specify)	

SECTION C: NATURAL RESOURCES
PULL OUT SHEET: NATURAL RESOURCES

Please indicate which of the following resources found naturally are consumed by the household.

Resource	Resource Code	Is the natural resource used by the household?	
		1 - Yes	2 - No
Fuelwood	01	1	2
Wood for household construction (eg. Poles)	02	1	2
Wood for household items (eg. Spoons, axe, etc)	03	1	2
Wood for furniture	04	1	2
Wood for carvings	05	1	2
Wild herbs/spinach	06	1	2
Medicinal plants (muthi plants)	07	1	2
Wild fruits	08	1	2
Mushrooms	09	1	2
Honey	10	1	2
Insects for food	11	1	2
Wild animals for food	12	1	2
Birds eggs	13	1	2
Thatch grass	14	1	2
Reeds	15	1	2
Grass for livestock	16	1	2
Tree leaves for livestock	17	1	2
Plant dyes	18	1	2
Plant resins	19	1	2
Clay	20	1	2
Sand	21	1	2
Twigs	22	1	2
Seeds	23	1	2
Twigs	24	1	2
Seeds	25	1	2
Water from lake	26	1	2
Water from boreholes	27	1	2
Land for agricultural use	28	1	2
Other _____	29	1	2
Other _____	30	1	2
Other _____	31	1	2
Other _____	32	1	2
Other _____	33	1	2

Proximity to the resource (Ask only for resources used in the pull-out sheet)

Resource Code	C01. What mode of transportation do you use to get to the location of the following resource? [code]	C02. How long does it take you to get to the following resource? [code]	C03. How often do you collect the resource? [code]	C04. Where resource used is located
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

C01. Codes	C02 Codes
01 Walking	01 Less than 5 minutes
02 Bicycle	02 5 – 15 minutes
03 Wheelbarrow	03 15 - 30 minutes
04 Vehicle	04 30 – 45 minutes
05 Other	05 More than 45 minutes
C03. Codes	
00 Never	
01 More than once a day	
02 Once a day	
03 Two to three times a week	
04 Once a week	
C04: Location code	
01 Own property	
02 Public property in the area	
03 Public property more than 5 km away	
04 Elsewhere	

Purchasing, sale and making products from natural resources

Resource Code	C05. Do you or anyone from your household purchase the following resource?	C06. Do you or anyone from your household purchase the following resource?	C07. Do you or anyone from your household produce product/s from the following resource?
	1-Yes 2-No	1-Yes 2-No	1-Yes 2-No
01	1 2	1 2	1 2
02	1 2	1 2	1 2
03	1 2	1 2	1 2
04	1 2	1 2	1 2
05	1 2	1 2	1 2
06	1 2	1 2	1 2
07	1 2	1 2	1 2
08	1 2	1 2	1 2
09	1 2	1 2	1 2
10	1 2	1 2	1 2
11	1 2	1 2	1 2
12	1 2	1 2	1 2
13	1 2	1 2	1 2
14	1 2	1 2	1 2
15	1 2	1 2	1 2
16	1 2	1 2	1 2
17	1 2	1 2	1 2
18	1 2	1 2	1 2
19	1 2	1 2	1 2
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21	1 2	1 2	1 2
22	1 2	1 2	1 2
23	1 2	1 2	1 2
24	1 2	1 2	1 2
25	1 2	1 2	1 2
26	1 2	1 2	1 2
27	1 2	1 2	1 2
28	1 2	1 2	1 2
29	1 2	1 2	1 2
30	1 2	1 2	1 2

C08. Impacts of access to natural resources

In general, do you think that having access to the following resource worsens, improves or has no effect on....?	Security in old age [code]	Security in times of economic crisis [code]	Options for income generations [code]	Ability to diversify income [code]	Food security [code]
01	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
02	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
03	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
04	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
05	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
06	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
07	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
08	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
09	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
10	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
11	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
12	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
13	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
14	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
15	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
16	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
17	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
18	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
19	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
20	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
21	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
22	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
23	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
24	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
25	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
26	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
27	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
28	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
29	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03
30	01 02 03	01 02 03	01 02 03	01 02 03	01 02 03

Codes
01 Worsens
02 Improves
03 No effect

Perceived changes in natural resources

Resource Code	C09. Perceived change in natural resource quantity in the last 5 years	C10. Reason/s for changes in quantity
01	01 02 03	
02	01 02 03	
03	01 02 03	
04	01 02 03	
05	01 02 03	
06	01 02 03	
07	01 02 03	
08	01 02 03	
09	01 02 03	
10	01 02 03	
11	01 02 03	
12	01 02 03	
13	01 02 03	
14	01 02 03	
15	01 02 03	
16	01 02 03	
17	01 02 03	
18	01 02 03	
19	01 02 03	
20	01 02 03	
21	01 02 03	
22	01 02 03	
23	01 02 03	
24	01 02 03	
25	01 02 03	
26	01 02 03	
27	01 02 03	
28	01 02 03	
29	01 02 03	
30	01 02 03	

<p>C09 codes:</p> <p>01 Increased 02 Decreased 03 No change</p>
<p>C10 codes:</p> <p>01 Not applicable 02 Don't know 03 Greater use of resources 04 Erosion 05 Seasonal/ climate variations 06 Urbanization and development 07 Other (specify)</p>

C11. Do you own/ have any of the following livestock?

01. Cattle	02. oxen	03. horses	04. goats	05. sheep	06. donkey / mule	07. pigs	08. Poultry	09. Other (specify)
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C12. If crops are grown, please list which are grown?

THANK RESPONDENT AND END INTERVIEW

Appendix 2: Focus Group Discussion Questions and Activities

A. Demographic profile of households in KwaDube and housing

- 1) What are the demographic profiles of households in KwaDube?
- 2) What are the main housing structures, specifically in relation to roofing, flooring and materials used to build the house?
- 3) What are the main energy, water and sanitation services in KwaDube?

B. Land and housing

- 1) What are the main ways that households use land?
- 2) Can people buy or sell land in this area? Can people rent land in this area?
- 3) Is there land that belongs to everyone in the village/community or to the village/community itself? Who uses that land? What do they use it for? Please tell me about any rules there are about using that land?
- 4) Do households use any communal resources that belong to the community, like gardens or boreholes?
- 5) If conflicts about land and/ or natural resources arise, how are they resolved?
- 6) Do people in this area usually live in a place they own or a place they rent?
- 7) Who generally gives or grants land? Who generally receives or inherits land?
- 8) Is it good or bad to have land? Why?

Activity: participatory/ mental mapping of map major land uses in the area

C. Natural resources

- 1) What are the main types of natural resources used in KwaDube?
- 2) How are these natural resources collected and by whom are they collected?
- 3) Where are the natural resources located?
- 4) How often do households use the natural resources and for what purposes? How is natural resource use linked to livelihoods?
- 5) What are the advantages and disadvantages of accessing and/ or owning natural resources?
- 6) How has the type and extent of natural resources in KwaDube changed over the years? What are the main causes/ drivers of these changes?
- 7) What problems do community members experience to access and use natural resources in KwaDube?

Activity: problem ranking exercise – main problems experienced in relation to accessing natural resources

D. Coping strategies

- 1) What are the main shocks and stressors that households experience?
- 9) How do they cope with these shocks? Do access to or control of natural resource assets improve the ability of households to cope? If so, which specific assets are important?