BIODIVERSITY CONSERVATION AND RURAL LIVELIHOODS: A COMPARATIVE STUDY OF SELECTED CONSERVATION APPROACHES IN ZIMBABWE

TANYARADZWA CHIGONDA

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UNIVERSITY OF KWAZULU-NATAL
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SUPERVISOR: PROFESSOR URMILLA BOB

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DECLARATION

Submitted in fulfilment of the requirements for the degree of PhD in Geography and Environmental Management in the School of Agrucultural, Earth and Environmental Sciences, College of Humanities and Social Sciences, University of KwaZulu Natal, Durban, South Africa.

I declare that the research work described in this thesis is my own original unaided work. All citations, references and borrowed ideas have been duly acknowledged. I confirm that an external editor was not used. None of the present work has been submitted previously for any degree or examination in any other university.

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Tanyaradzwa Chigonda (candidate) Date

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Professor Urmilla Bob (supervisor) Date

DEDICATION

TO

My mother, **Rhoda**, and in memory of my late father**, Tambudze.**

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ABSTRACT

Historically, protected areas have operated as islands of biodiversity conservation in isolation from nearby communities. There is, however, a growing consensus that for protected areas to be more effective in conserving biodiversity, particularly in developing countries, they must incorporate the livelihood needs of poor local communities they often share boundaries with. This is because most of these communities historically pre-date the protected areas, have pre-existing rights to resources in them and have often been adversely affected by their designation. Successful protected area management thus depends on the collaboration, involvement and support of local communities. In this context, this study examines biodiversity conservation in Zimbabwe using two case studies, a private protected area (Malilangwe) and a community-conserved area (Mahenye) in terms of their livelihood impacts on local communities. The need to incorporate livelihoods goals into conservation areas in Zimbabwe has further been necessitated by the persistent failure of conventional post-independence rural development initiatives in the country. The study employed the mixed-methods approach in data collection and analysis involving both quantitative (questionnaire) and qualitative (interviews, group discussions and observation) techniques. Simple random sampling was used in selecting 150 households for questionnaire interviews from each of the two targeted communities adjacent to the conservation areas, while purposive and snowball sampling were employed in selecting key-informant interviewees. The Statistical Package for the Social Sciences (SPSS) was used in analysing quantitative data, while thematic analysis was used to analyse qualitative data. The study identifies various livelihood benefits and costs from the conservation areas to the local communities. There were some similarities and differences in the livelihood impacts of the protected areas. The main livelihood benefits from the conservation areas to the communities included the enhancement of income, health and education; in addition to improved environmental sustainability. Various hindrances to the flow of the livelihood benefits were also identified. Among the livelihood costs from the conservation areas to the local communities included, inter alia, loss of land and livelihoods, destruction of crops by wildlife, devouring of livestock by wildlife and human harassment by wildlife. Such costs were further exacerbated by lack of compensation from the conservation areas. The study recommends various measures for enhancing livelihood benefits from the conservation areas to the local communities which include, inter alia, compensation to communities for livelihood costs incurred from conservation, increased community involvement in conservation decision-making and a widening of the portfolio of livelihood-enhancing initiatives by the conservation areas. The main contribution of this study to the conservation-development discourse in Zimbabwe is that it has shown that, besides the much publicised communal areas management programme for indigenous resources (CAMPFIRE), other conservation approaches such as private protected areas can achieve similar, if not better, livelihood impacts on surrounding communities. The need for policy makers to promote other conservation approaches, besides CAMPFIRE, as alternative and equally effective vehicles for attaining rural development through conservation is thus apparent.

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AIDS: Acquired Immunodeficiency Syndrome

AREX: Agricultural Research and Extension

ART: Africa Resources Trust

ARVs: Antiretroviral Drugs

CA: CAMPFIRE Association

CAMPFIRE: Communal Area Management Programme for Indigenous Resources

CASS: Centre for Applied Social Sciences

CBD COP: Convention on Biological Diversity Conference of the Parties

CBD: Convention on Biological Diversity

CBNRM: Community Based Natural Resource Management

CCG: CAMPFIRE Collaborative Group

DFID: UK Department for International Development

DNA: Deoxyribonucleic Acid

DNPWLM: Department of National Parks and Wildlife Management

ESAP: Economic Structural Adjustment Programme

FAO: Food and Agriculture Organisation of the United Nations

GDI: Gender-Related Development Index

GDP: Gross Domestic Product

GEF: Global Environment Facility

GEM: Gender Empowerment Measure

HIV: Human Immunodeficiency Virus

ICDPs: Integrated Conservation and Development Projects

IDS: Institute of Development Studies

IIED: International Institute for Environment and Development

IUCN: World Conservation Union

MCC: Mahenye CAMPFIRE Committee

MCSFS: Malilangwe Child Supplementary Feeding Scheme

MDC: Movement for Democratic Change

MDGs: Millennium Development Goals

MEA: Millennium Ecosystem Assessment

MLGRUD: Ministry of Local Government Rural and Urban Development

MPAs: Marine Protected Areas

MPWR: Malilangwe Private Wildlife Reserve

NGO: Non-Governmental Organisation

NTFPs: Non-Timber Forest Products

OECD: Organisation for Economic Cooperation and Development

PAC: Problem Animal Control

PAS: Poverty Assessment Survey

PES: Payments for Environmental Services

PWLMA: Parks and Wildlife Management Authority

RDC: Rural District Council

REDD: Reducing Emissions from Deforestation and Degradation

SADC: Southern African Development Community

SLA: Sustainable Livelihoods Approach

SPSS: Statistical Package for the Social Sciences

UNCED: United Nations Conference on Environment and Development

UNDP: United Nations Development Programme

UNEP: United Nations Environment Programme

UNESCO: United Nations Educational, Scientific and Cultural Organisation

UNICEF: United Nations International Children's Emergency Fund

UN-REDD: United Nations Reduced Emissions from Deforestation and Degradation

UNWTO: United Nations World Tourism Organisation

USA: United State of America

USAID: United States Agency for International Development

USFWS: United States Fish and Wildlife Services

VIDCO: Village Development Committee

WADCO: Ward Development Committee

WDPA: World Database of Protected Areas

WHO: World Health Organisation

WINDFALL: Wildlife Industries New Development for All

WRI: World Resources Institute

WWF: World Wide Fund for Nature

Z$: Zimbabwe Dollar

ZANU PF: Zimbabwe African National Union Patriotic Front

ZIMTRUST: The Zimbabwe Trust

CHAPTER ONE: ORIENTATION TO THE STUDY

1.1 Background and problem statement

In spite of new evidence on the urbanisation of global poverty, poverty is still predominantly a rural phenomenon (Bain et al, 2014; Dercon, 2009; Meilby et al, 2014; Ravallion et al, 2007). Owing to, among other reasons, an urban bias in government expenditures, living conditions in terms of access to education, health care, nutrition, safe water and sanitation faced by the rural poor, particularly in developing countries, are much worse than those faced by the urban poor (Bain et al, 2014; Dao, 2004; Dercon, 2006; 2009; Imran et al, 2014; Sahn and Stifel, 2004; Sánchez-Zamora et al, 2014). Recent poverty estimates suggest that approximately three quarters of the world's poorest people live in rural areas, well above the overall global population share of about 58% living in these rural areas (Meilby et al, 2014; Ravallion et al, 2007).

In September 2000, the Member States of the United Nations (UN) resolved to halve by the year 2015 the proportion of the world's people whose income is less than one dollar a day and who suffer from hunger (Rahman and Westley, 2001; Ramchandani and Karmarkar, 2014; Sachs et al, 2009; Turner et al, 2012). Current estimates put the number of people living in extreme poverty at 1.1 billion with the majority living in South Asia and sub-Saharan Africa (Perera and Lee, 2013; Ramchandani and Karmarkar, 2014; Sumner, 2010; United Nations Development Programme - UNDP, 2006; 2010). However, progress in poverty reduction has not been satisfactory (Ferreira and Ravallion, 2008; Perera and Lee 2013; Sumner, 2010; Vandemoortele, 2002). For example, in sub-Saharan Africa, poverty was essentially the same in 2004 and 1981, having first grown during the 1980s, and then declined slowly since the late 1990s (Ferreira and Ravallion, 2008). The number of poor people also rose in South Asia, Central Asia, and Latin America, where economic stagnation and persistent inequality in the last decades prevented substantial progress against poverty (Ferreira and Ravallion, 2008). The International Fund for Agricultural Development (2001) notes that in the decade from 1990 to 2000, poverty reduction in South Asia and Latin America was barely a third of what was required, while in sub-Saharan Africa it was only one-sixth of the target. Such small declines in poverty rates, combined with a growing population, translate into a rise in the absolute number of people living in households below the US$1-a-day poverty line (Ferreira and Ravallion, 2008; Ravallion et al, 2007). At current patterns of economic growth, population growth and poverty reduction, poverty is likely to

remain high on the global agenda in the foreseeable future, particularly in the rural areas of the developing world (Bergh and Nilsson, 2014; Chen and Ravallion, 2008; Ravallion et al, 2007). Despite projected gains in poverty alleviation, over 60% of the world's absolutely poor will live in rural areas by 2025 (Bigsten and Schimeles, 2007). With only a few months left on the 14-year timeline of the UN Millennium Development Goals (MDGs), it is clear that developing countries are racing against time to attain the MDGs on eradicating extreme poverty and hunger, with experts rightly noting the herculean nature of such a task (Bain et al, 2014; Ferreira and Ravallion, 2008; Perera and Lee, 2013; Sumner, 2010).

Zimbabwe epitomises the rural-urban poverty dichotomy outlined above. The first comprehensive Poverty Assessment Survey (PAS) carried out in 1995 revealed that about 75% of the rural population were poor and 25% were non-poor, while in the urban areas the poor and non-poor were 39% and 61%, respectively (Hamdok, 1999). Zimbabwe carried out its Second PAS in 2003 which indicated that poverty had increased considerably between 1995 and 2003, with the proportion of very poor households increasing from 20% in 1995 to 48% in 2003 (Ministry of Public Service, Labour and Social Welfare, 2006). The percentage of the very poor was higher in the rural areas (63%) than in the urban areas (53%), though there was a higher percentage increase of poverty in urban areas (65%) than in rural areas (42%) between 1995 and 2003 (Ministry of Public Service, Labour and Social Welfare, 2006). Rural households in Zimbabwe are mainly located in the communal areas - areas of poorer agricultural potential to which the native population was forcibly resettled by successive former colonial governments (Chavunduka and Bromley, 2013; Gandiwa et al, 2014). Three quarters of communal area households live in areas with rainfall less than 650 mm per year and, consequently, are generally worse off than urban households with respect to deprivation to basic social services, education, shelter and decent standard of living (Cavendish, 2000; Feresu, 2010).

With the coming of independence in 1980, the new Zimbabwe government adopted various strategies aimed towards developing the country's rural areas. However, as shall be shown in greater detail in Chapter Four, post-independence attempts towards rural development in Zimbabwe were not quite successful as these persistently failed to significantly reduce rural poverty in the country (Bond, 1999; Hurungo, 2007; UNDP, 2010). The beginning of the 21st century witnessed a rapid economic decline in Zimbabwe due to various reasons. The haphazardly embarked upon fast-track land reform programme, which started in the year

2000, and which sought to redress the land ownership imbalances inherited from the colonial period, has led to the deterioration of agricultural production leading to a significant collapse of the agricultural sector (Chavunduka and Bromley, 2013; Chitiga, 2004), a sector which had been the backbone of the country's economy, and more so the rural economy, for many years. This has further been worsened by massive deindustrialisation which has seen unemployment and poverty levels rising, with 80% of the population living below the official poverty line in 2005 (Rihoy et al, 2010). Between 2000 and 2003, Zimbabwe's Gross Domestic Product (GDP) plummeted by 30%, manufacturing declined by 51% between 2000 and 2005, while exports fell by half between 2001 and 2005, with such downward trends manifesting to this day (Chavunduka and Bromley, 2013; Hurungo, 2007; Nyahunzvi, 2014; Potts, 2006; Rihoy et al, 2010; UNDP, 2010). The economic challenges currently facing Zimbabwe have derailed efforts towards bringing development to the rural areas of the country long neglected since colonial times. While the urban areas have also been adversely affected by the country's current economic crisis, the nearly hundred years of preferential treatment they received during the colonial era at the expense of the rural areas means that they are relatively better placed to face these challenges compared to the communal areas. The above-noted macro-economic decline in the country in the last decade and half since 2000 has heightened sustainability issues in the rural areas of Zimbabwe.

Over the last few decades, biodiversity conservation has come to be seen as a variant of sustainable community development particularly in the rural areas of developing countries (Buta et al, 2014; Gurney et al, 2014; Meilby et al, 2014). Thus, biodiversity conservation can be a viable alternative to rural development in Zimbabwe. It is worth noting that many of the rural poor in the world are located in tropical regions that are also biologically diverse, with the majority of them highly dependent on natural resources for meeting their sustenance requirements (de Sherbinin et al, 2008; Meilby et al, 2014; Mutenje et al, 2011; Romero et al, 2012; Turner et al, 2012). Historically, protected areas have been viewed as islands of biodiversity conservation with little or no connection to nearby communities (Bennett and Dearden, 2014; Buta et al, 2014). More recent studies have shown that successful protected area management depends on the collaboration, involvement and support of local communities as most of these communities historically pre-date the protected areas (and thus have pre-existing rights to resources in them) and have also often been adversely affected by their designation (Buta et al, 2014). In the growing literature at the interface of rural livelihoods improvement and conservation of natural resources, two overarching issues stand

out: firstly, how and to what extent use of natural resources does, can, and should contribute to poverty alleviation and secondly, how and to what extent poverty alleviation and conservation are, and can be made, convergent rather than divergent goals (Meilby et al, 2014; Sunderlin et al, 2005; Turner et al, 2012; Walpole and Wilder, 2008).

In tune with the above international biodiversity conservation trends, and given the challenges facing efforts to develop the rural areas of Zimbabwe, many studies (Bond, 1999; 2001; Child, 1993; Fischer et al, 2011; Frost and Bond, 2008; Gandiwa et al, 2013; Harrison et al, 2014; Martin, 1986; Mashinya, 2007; Murombedzi, 2001; Murphree, 2001; Murphree, 2005; Nemarundwe, 2005; Rihoy et al, 2010) have in the past three and a half decades looked at the possible role that natural resource conservation could play towards poverty alleviation in the country's rural areas. Most of these studies on conservation and livelihoods have, however, tended to emphasise community-based conservation at the expense of other conservation approaches which have received much less scholarly attention. This paucity in comparative research into the conservation-development nexus in Zimbabwe has hampered meaningful policy debate. This study undertakes a comparative analysis of two of the main natural resource conservation approaches in Zimbabwe, namely, a privately-owned protected area and a community-based protected area, in terms of their contribution to livelihoods in the surrounding rural areas.

1.2 Significance of the study

Alongside other national policy agendas, biodiversity conservation now occupies a prominent position in Zimbabwe mainly due to two reasons (Chenje et al, 1998; Ministry of Environment and Natural Resources Management, 2009). First, in spite of longstanding and concerted efforts directed towards conserving the country's biological resources, empirical evidence on the ground points to a significant and continued decline in the natural resources of the country (Baudron et al, 2011; Chenje et al, 1998; Feresu, 2010; Government of Zimbabwe, 1998; Ministry of Environment and Natural Resources Management, 2009; Ministry of Environment and Natural Resources Management, 2010). For instance, the loss of forest biodiversity has resulted in some of Zimbabwe's plant species being listed on the Southern African Plant Red Data List (Feresu, 2010). A similar decline has also been registered within the faunal component of Zimbabwe's biological diversity. For example, among the mammals, the World Conservation Union (IUCN) Red Data List of Threatened Species considers the black rhinoceros to be critically endangered; the painted wolf or

African wild dog as endangered; while the vulnerable species include the brown hyena, the cheetah, the white rhinoceros, the hippopotamus, the lion, the Galagonidae, the crocodile and the African elephant (Frost and Bond, 2008; Ministry of Environment and Natural Resources Management, 2010; Zimstat, 2010). Fourteen of the country's bird species are of global conservation concern, with one classified as endangered, seven as vulnerable, and with the balance considered to be nearly-threatened (Feresu, 2010). Fish species diversity and population in some of the major water bodies of the country are also on the decline due to various reasons (Ministry of Environment and Natural Resources Management, 2010).

The continued decline in the country's biological resources calls for the need to act quickly. This requires a re-examination of current conservation strategies in order to strengthen national biodiversity conservation policy. Some of the pressures driving biodiversity loss in Zimbabwe include deforestation and land degradation (especially after the 2000 fast-track land reform programme), wildfires, invasive alien species, climate change (especially more frequent droughts), unsustainable hunting quotas, poaching and pollution (Chenje et al, 1998; Ministry of Environment and Natural Resources Management, 2010). If drastic measures are not taken so as to check on the above threats to the country's biological resources, an increasing number of these will be threatened, eventually becoming extinct.

Second, as hinted earlier, the failure of conventional rural development approaches in Zimbabwe has seen policy-makers increasingly trying out other rural development avenues, including biodiversity conservation. It is important to note that most people in the rural areas of Zimbabwe, particularly in the communal areas, heavily depend on natural products derived from forests and woodlands to sustain their livelihoods (Cavendish, 2000; Feresu, 2010; Government of Zimbabwe, 2002; Ministry of Environment and Natural Resources Management, 2010; Muboko and Murindagomo, 2014). Under such circumstances, the above noted continued loss of the country's biological diversity is therefore a serious cause for concern. Additionally, it therefore follows that biodiversity conservation areas in Zimbabwe have the potential to either disrupt or enhance the livelihoods of adjacent communities by either denying local access to critical natural resources or through various outreach activities with these surrounding communities.

The three decades of experience from attempts at combining nature protection and development in Zimbabwe since the late 1980s have highlighted some challenges that deserve continued examination (Duffy, 2000; Government of Zimbabwe, 2002; Muboko and

Murindagomo, 2014; Mutandwa and Gadzirayi, 2007). The main challenge for conservation authorities the world over is to come up with conservation initiatives embracing the livelihoods needs of adjacent communities (Makindi, 2010; Meilby et al, 2014; Miller, 2014; Pinho et al, 2014; Turner et al, 2012). The constant call in the current international conservation literature is that conservation areas cannot survive without meaningfully contributing to the livelihoods of the natural-resource dependent poor rural communities they often find themselves sharing boundaries with (Cronkleton et al, 2012; Gurney et al, 2014; Kashwan, 2013; McNeely and Miller, 1984; Mombeshora and Le Bel, 2009; Pinho et al, 2014; Romero et al, 2012; Scherl et al, 2004; Zhang et al, 2014). The findings of this study have the potential to assist policy-makers, conservation organisations and local communities in coming up with conservation strategies that improve the livelihoods of the local communities without compromising the ecological integrity of biodiversity. There has not been a study that examines rural livelihoods in relation to protected areas by adopting a comparative analysis of cases from different conservation approaches in Zimbabwe. While a few comparative studies have been conducted, for example Bond (1999) and Mashinya (2007), these have focused on comparing community-based conservation cases, with none comparing cases from different conservation approaches. It is hoped that the comparative perspective on two different conservation approaches that this study adopts will close this gap in research, and has potential to bring out new insights to the discourse on conservation and development in Zimbabwe, since it adopts an approach that has not been embarked upon by previous researchers.

1.3 Aim of the study

The study aims to provide a comparative analysis of the contributions of two cases from two of the main conservation approaches in Zimbabwe, namely, a privately owned conservation area and a community-based conservation area, towards the sustainability of the livelihoods of local rural communities.

1.4 Research objectives

To achieve the above aim, the study looks at the following specific objectives:

- To describe the demographic and socio-economic characteristics of the local communities in the study sites and determine levels of development and dependence on biodiversity
- To examine livelihood benefits to local communities from the conservation areas

- To identify hindrances to the flow of conservation benefits to communities
- To examine livelihood costs to local communities from the conservation areas
- To assess the state of biodiversity in the conservation areas
- To make recommendations, based on research findings, for an enhanced attainment of conservation and livelihoods goals in the study sites

1.5 Scope of the study

The study specifically looks at both the positive and negative impacts of two conservation approaches, namely, a community-based conservation area and a private conservation area, on the livelihoods of local communities. The two sites are Mahenye ward in Chipinge District of Manicaland Province and Malilangwe Private Wildlife Reserve (MPWR) in the neighbouring Chiredzi District in Masvingo Province, respectively. The adjacent Chizvirizvi community was particularly selected for the investigation of the livelihood impacts of MPWR on nearby rural communities. Since Mahenye ward is a community-conserved area, the investigation of livelihood impacts was therefore confined to the same area. The two sites were then compared regarding their impacts on the livelihoods of rural communities.

In the context of this study, livelihoods have been taken to mean "…the way of life and work which helps persons or communities to meet their needs for survival" (Kothari, 1997 cited in Njiru, 2007: 6). A livelihood comprises the capabilities, assets and activities required for a means of living (Chambers and Conway, 1992; Ferrol-Schulte et al, 2013), with assets referring to the basic material and social resources that people have in their possession (Bennett and Dearden, 2014; Chambers and Conway, 1992; Ferrol-Schulte et al, 2013; Fisher et al, 2013; Scoones, 1998).

1.6 Thesis chapter outline

The introductory chapter, Chapter One, has presented the research problem, aim and objectives of the study, and the scope of the study. The chapter has also highlighted the significance of this study towards attaining a balance between biodiversity conservation and livelihood enhancement in the two study sites in particular, and in Zimbabwe in general.

Chapter Two presents the theoretical conceptual framework within which the concepts of conservation and livelihoods are proposed, formulated and discussed. The Sustainable Livelihoods Approach (SLA) and Political Ecology have been chosen as theoretical guides for this research.

Chapter Three critically examines and discusses information and findings currently available in the domain of biodiversity conservation and development in relation to the objectives of the study. The aim is to probe and disclose existing gaps in the literature requiring further investigation. A review of policy documents on biodiversity conservation and livelihoods in Zimbabwe is covered in Chapter Four.

Chapter Five outlines the processes and procedures that were followed in conducting the study. These include the research questions framing the research, a description of the study areas, the research design, target populations, the instruments that were used in data collection, the sampling procedures employed, and how the collected data sets were processed, analysed and presented.

Chapter Six presents and analyses the findings of the study. The chapter also provides a discussion and comparative analysis of the findings from the study sites.

The final chapter of the thesis, Chapter Seven, summarises the key findings of the research, the aim being to answer the research questions and assess whether the objectives of the study were achieved. Based on the findings of the research, the chapter also proposes some recommendations for enhancing the attainment of conservation-livelihoods goals in the study areas, in addition to identifying areas that need further study. The chapter concludes by emphasising the contribution of the study results to the conservation and development framework in Zimbabwe.

1.7 Conclusion

Zimbabwe is endowed with a wide diversity of biological resources. The biodiversity of the country is crucial in terms of direct contribution to GDP and also as an important livelihood source for many poor rural households. With rural development efforts since independence persistently failing to reduce poverty, the role of biological resources as a livelihood source in the rural areas of Zimbabwe has increasingly been appreciated. There are, however, some strong indications confirming that the country's biological diversity is on the decline. Considering the immense contributions of biodiversity to the country, and to rural households in particular, such a decline is serious cause for concern. The need for the country's natural resource managers and policy-makers to develop effective conservation measures that incorporate livelihoods goals is therefore apparent. This particular study seeks to contribute new knowledge to the conservation-livelihoods nexus in Zimbabwe.

CHAPTER TWO: CONCEPTUAL AND THEORETICAL FRAMEWORK

2.1 Introduction

The link between theory and research, particularly social research, is highlighted by Bryman (2008: 6) who states that "theory is important to the social researcher because it provides a backcloth and rationale for the research that is being conducted. It also provides a framework within which social phenomena can be understood and the research findings can be interpreted". This chapter presents the theoretical conceptual framework within which the concepts of conservation and livelihoods are discussed. The study draws from the SLA and political ecology as theoretical guides to provide understanding and discussion of the links between biodiversity conservation and the sustainability of rural livelihoods.

2.2 The Sustainable Livelihoods Approach (SLA)

The concept of sustainable rural livelihoods is increasingly becoming central to the debate about rural development, poverty reduction and environmental management (Scoones, 1998). The emergence of the sustainable livelihoods concept had all the qualities of a classic paradigm shift, defined as a fundamental change in approach or underlying assumptions (Solesbury, 2003). The shift came at a time when previous dominant theories and practices, particularly those associated with integrated rural development, were losing their intellectual and political attraction (Solesbury, 2003). These conventional definitions and approaches to poverty eradication had been found to be too narrow because they focused only on certain aspects or manifestations of poverty, such as low income without considering other aspects of poverty such as vulnerability and social exclusion (Jacob et al, 2013; Krantz, 2001; Ratner et al, 2014). There is now a recognition that more attention must be paid to the various factors and processes which either constrain or enhance poor people's ability to make a living in an economically, ecologically and socially sustainable manner, and the SLA offers a fresh, more coherent, and integrated approach to poverty reduction (Krantz, 2001). According to Timmermans (2004), sustainable livelihoods theory proposes an alternative view that stresses the importance of understanding processes of rural change by focusing on the heterogeneity of interests and power among different social groups within communities, with a consistent focus on marginalised groups. Perhaps the main distinguishing feature of the SLA is its attempt to understand poverty and marginalisation in terms of access to (or exclusion from) livelihood assets, and the role played by institutions in favouring some groups (usually the

richer) over others (usually the poorer) (Carney, 1998; Timmermans, 2004). The SLA therefore practically places people, rather than resources, facilities or organisations, as the focus of concern and action, and emphasises that development must be participatory and improvements must be sustainable (Solesbury, 2003).

The sustainable livelihoods idea was first introduced by the Brundtland Commission on Environment and Development in 1987 in terms of resource ownership and access to basic needs and livelihood security especially in rural areas (Ahebwa, 2012; Elasha et al, 2005; Krantz, 2001; Scoones, 2009). The 1992 UN Conference on Environment and Development (UNCED) expanded the concept, advocating for the achievement of sustainable livelihoods as a broad goal for poverty eradication (Krantz, 2001; Scoones, 2009).

2.2.1 Elements of the SLA

According to Chambers and Conway (1992), a livelihood comprises the capabilities, assets and activities required for a means of living. Capabilities refer to a person's, or a household's ability to cope with stresses and shocks, and the ability to find and make use of livelihood opportunities (Bennett and Dearden, 2014; Champers and Conway, 1992; Fisher et al, 2013). Assets refer to the basic material and social resources that people have in their possession (stores, resources, claims etc.) (Chambers and Conway, 1992; Ferrol-Schulte et al, 2013; Scoones, 1998). A livelihood is considered to be sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, both now and in the future, while not undermining the natural resource base (Carney, 1998; Chambers and Conway, 1992; Scoones, 1998; Soltani et al, 2012; Timmermans, 2004). It is important to note that for a livelihood to be sustainable, it should also contribute net benefits to other livelihoods (Chambers and Conway, 1992).

Scoones (1998) developed a conceptual framework (Figure 2.1) to guide research into sustainable livelihoods, while Carney (1998) and McDowell (2002) also developed slightly modified versions to guide development aid policy and resettlement policy respectively (Timmermans, 2004). Various development agencies such as the UK Department for International Development (DFID), Oxfam, UNDP, and the Institute of Development Studies (IDS) have also come up with slightly different versions of the sustainable livelihoods framework suiting their own development activities in various developing countries (Bennett and Dearden, 2014; de Statge, 2002; Soltani et al, 2012). Common to most sustainable

livelihoods frameworks proposed, however, is the recognition that there are a number of micro to macro-level contextual factors that transform and mediate access to assets and have impacts on livelihood strategies and the resultant socio-economic and environmental outcomes (Bennett and Dearden, 2014; Krantz, 2001). The SLA employs a holistic perspective in the analysis of livelihoods so as to identify those issues of subject areas where an intervention could be strategically important for effective poverty reduction. The SLA also places great emphasis on involving people in both the identification and implementation of activities where appropriate (Krantz, 2001).

The key components of the SLA (Figure 2.1) are: the vulnerability context; the livelihood assets (capital) available to people; the institutional processes and organisational structures that influence access to these resources; the livelihood strategies that people adopt; and the livelihood outcomes resulting from these strategies (Scoones, 1998; Fisher et al, 2013). The sustainable livelihoods framework is based on the understanding that livelihoods result from a complex interaction of a dynamic set of factors that influence people's livelihood choices including the physical, socio-political, economic, institutional and historical contexts in which they occur (Carney, 1998; Ferrol-Schulte et al, 2013; Scoones, 2009; Timmermans, 2004).

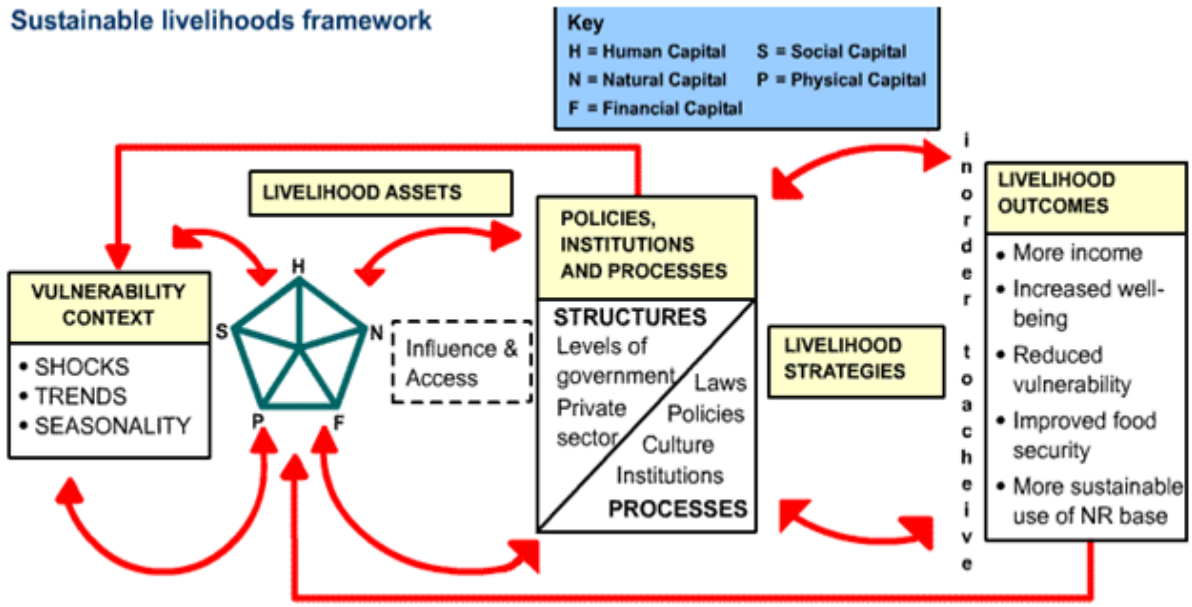

Figure 2.1: The Sustainable Livelihoods Framework
Source: Scoones (1998 cited in Timmermans, 2004: 4)

Vulnerability is often a key component of poverty and an understanding of the vulnerability context provides an insight into the kinds of factors that have potential to negatively impact on people's livelihoods (Jacob et al, 2013; Ratner et al, 2014; Timmermans, 2004). Reducing vulnerability is a key livelihood objective which may influence people's choice of livelihood strategy (Chambers and Conway, 1992; Ratner et al, 2014). Chambers and Conway (1992) have characterised vulnerability elements (disturbances) into trends, shocks and seasonal events. Trends are slow-moving changes in the macro-environment including broader population trends, natural resource trends and/or national and international economic trends. Shocks on the other hand are sudden, unpredictable and traumatic and include droughts, fires, epidemics, conflicts and/ or sudden changes in the economy (Chambers and Conway, 1992; Jacob et al, 2013). Seasonal disturbances may relate to commodity prices, production capabilities, access to natural resources and employment opportunities (Chambers and Conway, 1992). The vulnerability context therefore helps in identifying areas in which development agencies can assist in reducing vulnerability.

Central to the sustainable livelihoods framework are a number of capitals or assets that are the platform or building blocks from which livelihoods are generated (Bennett and Dearden, 2014; Ferrol-Schulte et al, 2013; Fisher et al, 2013). The SLA portrays assets in terms of five capital forms namely human, natural, financial, physical, and social capital (Bennett and Dearden, 2014; Liu et al, 2014; Sanchez-Zamora et al, 2014; Scoones, 1998; Soltani et al, 2012). Human capital has been identified as a key issue in processes of rural change and the factors that comprise human capital include education and skills, entrepreneurship, demographic structure, ability to labour and good health, and physical capability important for the successful pursuit of different livelihood strategies (Sanchez-Zamora et al, 2014; Scoones, 1998). Natural capital refers to the natural resource stocks (soil, water, air, genetic resources, etc.) from which resource flows and services useful for livelihoods are derived (Fisher et al, 2013; Scoones, 1998). Financial capital refers to the stocks and flows of money people use to achieve their livelihood objectives and this includes savings and access to credit and/or income earned directly through, for example, employment or indirectly, for example, through welfare grants and remittances (Chambers and Conway, 1992; Scoones, 1998; Timmermans, 2004). Physical capital refers to basic infrastructure, services, equipment and technologies that are needed to support livelihoods (Scoones, 1998). Lastly, social capital refers to the social resources that people draw on in pursuit of livelihood objectives (Chambers and Conway, 1992; Liu et al, 2014; Scoones, 1998). These may include family

and kinship networks, other forms of inter-household cooperation, membership of formalised groups, public-private partnerships, quality of leadership and the degree of cooperation within communities (Chambers and Conway, 1992; Liu et al, 2014; Sanchez-Zamora et al, 2014; Scoones, 1998; Timmermans, 2004).

Transforming structures and processes refer to systems of local administration and socio-economic organisation as mediated through institutions, governance, policies, culture and legislation (Scoones, 1998; Timmermans, 2004). They are considered important because they determine access to the various types of capital, to livelihood strategies, and to decision-making bodies and sources of influence (Timmermans, 2004). Understanding institutional processes and structures therefore allows for the identification of restrictions or barriers and opportunities to sustainable livelihoods (Scoones, 1998).

Livelihood strategies refer to the range and combination of activities that people undertake in order to achieve their livelihood objectives (Chambers and Conway, 1992; Scoones, 1998; Soltani et al, 2012). The types of livelihood options available to people are influenced by the vulnerability context, the extent of livelihood assets and the nature of transforming structures and processes (Chambers and Conway, 1992; Scoones, 1998). Lastly, livelihood outcomes refer to the outcomes of people's livelihood strategies. The SLA identifies five potential outcomes: increased income, increased well-being, reduced vulnerability, improved food security and more sustainable use of the natural resource base (Carney, 1998; Chambers and Conway, 1992; Ellis, 2000; Scoones, 1998).

2.2.2 Relevance of the SLA to current study

The appropriateness of the SLA for this study lies in the fact that it provides a conceptual model for the integration of environmental issues into a holistic rural development framework by placing a strong focus on natural resources as productive assets in supporting rural livelihoods (Carney, 1998; Ferrol-Schulte et al, 2013; Fisher et al, 2005; Timmermans, 2004). The SLA views rural households as making a living in a variety of ways through the interaction of various assets within a broader policy environment (Chimhowu and Hulme, 2006). The SLA was also specifically designed for application to research problems in developing country contexts where high levels of rural poverty, population density, underdevelopment and natural resource dependency are often the norm (Carney, 1998; McDowell, 2002; Timmermans, 2004). There is a growing body of literature proving that

poor rural households often derive a significant share of their income from natural resource based activities (Cavendish, 2000; Mainka et al, 2008; Millennium Ecosystem Assessment - MEA, 2005a).

The nature and extent of the links between conservation and livelihoods, including the roles and responsibilities of different interest groups in addressing them, remain disputed (Roe and Walpole, 2010; Sanderson and Redford, 2003). For example, Lockwood et al (2006) note that protected areas are detrimental to livelihoods through denying or reducing community access to traditionally used resources (assets), while other commentators like BirdLife International (2007) and Borrini-Feyeraband et al (2004) highlight the importance of protected areas in sustaining the flow of various ecosystem services. Others still, like Upton et al (2008) note that overall, protected areas are unlikely to be as damaging or as beneficial to livelihoods as some scholars have suggested. Much depends on how the protected areas are defined, the contexts under which they are established and managed, and the ways in which benefits and costs are distributed (Rosser and Leader-Williams, 2010; Upton et al, 2008; Wells, 1992). In other words, the relationship between conservation and livelihoods is played out differently in different contexts and localities.

The SLA is certainly relevant to this research which seeks an understanding of the relationship between biodiversity conservation and rural livelihoods in two different conservation sites especially as regards access by local communities to natural resources or other conservation-related benefits. To conservationists, understanding the aspects of livelihood is vital to comprehend the effectiveness of the conservation and development policy interventions aimed at addressing livelihoods and conservation concerns (Ahebwa, 2012). This is because community livelihood requirements in many developing countries have most of the time been in conflict with conservation objectives (Ahebwa, 2012).

The SLA, however, has by no means come without criticism. Some critics argue that the sustainable livelihoods framework implicitly accepts the status quo of poverty and inequality by focusing only on encouraging the poor to use what they have in a better way (de Statge, 2002; Murray, 2000). Indeed, the hallmark of the livelihoods approach is its emphasis on the capabilities of the rural poor, based on the recognition that even the poorest of the poor families hold wealth in at least some of the five categories of wealth the framework identifies (de Sherbinin et al, 2008). Some critics argue that the livelihoods framework may underplay the structural constraints that keep the poor in poverty (Bundlender and Dube, 1998; de

Statge, 2002; Murray, 2000). Echoing this, Scoones and Wolmer (2003) state that hidden in the 'policies, institutions and processes' box of the livelihoods framework was a whole world of complex institutional arrangements, social relations and policy processes, all influenced by power and politics. The rather technocratic application of the livelihoods framework in the context of aid programming and project planning downplays issues of power and politics (Scoones, 2009; Scoones and Wolmer, 2003). Under the guise of 'governance approaches', such issues could be talked about at the margins (Scoones, 2009; Scoones and Wolmer, 2003). Other critics further allege that the livelihoods framework can romanticise and idealise the poor which results in participatory processes that listen uncritically and accept the outcomes of activities at face value (Bundlender and Dube, 1998; de Statge, 2002).

In spite of the above and other criticisms, the sustainable livelihoods framework has a lot to offer to rural development. Indeed, the sustainable livelihoods perspective has been central to rural development thinking and practice in the past few decades.

2.3 Political ecology: exploring the political contours of conservation

Political ecology has emerged, since the 1980s, as a fast-growing and important framework for understanding political economy factors in human-ecosystem interactions, involving the recognition that economic and political factors strongly influence the relationship of people and natural resources (Fisher et al, 2005; Fisher et al, 2013; Wilshusen, 2003). Borgerhoff Mulder and Coppolillo (2005) define political ecology as the politics of environmental change, or the political dimension of human-environment interactions.

Political ecology has emerged as a research agenda for those interested in probing the social and political processes tied to environmental change and, as such, does not present one coherent framework (Wilshusen, 2003). Rather, it presents related areas of intellectual inquiry drawing on perspectives from both the natural and social sciences (Blaikie, 1994; Bryant and Bailey, 1997; Wilshusen, 2003). This wide range of theoretical sources for determining how power mediates human-environment interactions includes avenues such as gender studies, poststructuralism, social movements' theory, and rural sociology (Borgerhoff Mulder and Coppolillo, 2005). The main question posed within political ecology concerns the political interactions and outcomes associated with environmental management, particularly in developing countries (Wilshusen, 2003). The central emphasis on politics directs attention

to the struggles among diverse actors over natural resource access and control (Neumann, 1998; Vayda and Walters, 1999; Wilshusen, 2003).

Political ecology emerged as reaction to forerunning ecological anthropology and cultural ecology which had tended to portray societies in harmony with nature (Fisher et al, 2013). These had been concerned almost exclusively with the homeostatic processes internal to the community under study, ignoring broader political processes (Borgerhoff Mulder and Coppolillo, 2005; Bryant and Bailey, 1997). Political ecology brought a more structuralist analysis, pointing to the imprints of markets, social inequality, conflict and the dislocations of both postcolonial situations and rapid globalisation (Fisher et al, 2005; Fisher et al, 2013). Fisher et al (2013: 6) further note that the field of political ecology also developed as a reaction to "apolitical environmental science which tends to offer apolitical answers to political questions, such as those surrounding global consumption disparities". Political ecology thus focuses on the influence of ultimate rather than proximate causes of environmental change (Fisher et al, 2013).

Borgerhoff Mulder and Coppolillo (2005) have identified at least five themes of analysis characterising political ecological approaches to the study of conservation and protected areas. First, there is a strong emphasis on moving away from case studies that are purely local towards a consideration of all actors, local to global, and all intervening levels, from peasants, local businesses, district administrators, and national governments to international organisations (Borgerhoff Mulder and Coppolillo, 2005; Brown, 1998; Neumann, 1998).

A second defining characteristic of political ecology is that it is actor-based, focusing on all the people and organisations that are involved in conflicts over environmental issues (Borgerhoff Mulder and Coppolillo, 2005; Wilshusen, 2003). Questions frequently asked by political ecologists include, who are the stakeholders, the people whose interests are directly challenged by changes in the natural environment? What are the political consequences of a new natural resources management scheme, and who is particularly vulnerable? Who gets what and who controls nature? (Borgerhoff Mulder and Coppolillo, 2005; Fisher et al, 2005; Fisher et al, 2013). The political ecologist's concern is that it is often the community's most poverty stricken members who suffer the most not just from environmental degradation, but also from conservation policies (Borgerhoff Mulder and Coppolillo, 2005).

The third characteristic of political ecology lies in its deep commitment to a historical approach (Borgerhoff Mulder and Coppolillo, 2005; Fisher et al, 2013; Wilshusen, 2003). A historical perspective offers an explanation of past events and processes of change in order to better understand current conditions (Blaikie, 1995; Wilshusen, 2003). Bringing history to the evaluation of a contemporary conservation conflict or project can shed light on which development initiatives work and why (Borgerhoff Mulder and Coppolillo, 2005). It would therefore be a good idea for people working in the fields of conservation and development to elicit local histories for each community incorporated in the project area as, even within a small and relatively homogenous area, different communities respond very differently to development initiatives (Borgerhoff Mulder and Coppolillo, 2005).

Fourth, political ecological analyses pay special attention to the suite of socio-economic factors implicated in environmental destruction, most commonly class, gender and race (Borgerhoff Mulder and Coppolillo, 2005). Within this framework, feminist political ecology has arisen as a distinct subfield (Agarwal, 1992). Finally, political ecology attends to the social construction of natural resources by social actors at each level, from village headman to international institutions. Particular attention is given to how different stakeholders value and culturally define land and other natural resources (Fairhead and Leach, 1996; Fisher et al, 2013), and the recognition that such concepts are never free from political influence (Bryant and Bailey, 1997).

In short, political ecology spans the local to global continuum, revolves around stakeholders with often competing interests, is grounded in history, and pays particular attention to issues of race, gender, class and meaning. These characteristics of political ecology make it a suitable theoretical guide within which issues of conservation and livelihoods, which the current study focuses on, can be explored and discussed. In particular, the political ecological framework is useful in unpacking the various local to non-local factors, and also local to non-local actors, involved in the conservation and livelihoods initiatives in the two study areas.

2.4 Conclusion

This chapter has explored the conceptual and theoretical framework to help in understanding the linkages between biodiversity conservation and livelihoods. The SLA has been very important in rural development practice for the past few decades. Much of its relevance comes from the fact that it tries to identify the various assets (capital) among rural

communities which can help towards their development, including natural resources (natural capital). The framework also identifies the various transforming structures and processes in rural communities which are important as they determine access to the various assets needed to support rural livelihoods. An understanding of the livelihood assets and the transforming structures and processes in rural areas is crucial for organisations simultaneously pursuing conservation and development goals. The sustainable livelihoods framework aids in identifying the various components of natural capital crucial for sustaining rural livelihoods, and also the various barriers to accessing such assets. The SLA thus helps in integrating natural resources into the rural development framework.

Political ecology recognises that there are various stakeholders involved in the conservation and sustainable utilisation of natural resources, some of whom being local while others are non-local actors. The political ecological framework is also important for understanding the political economy factors in human-environment interactions by recognising that political and economic factors strongly influence the relationship between people and natural resources. There is no doubt that local level and wider scale actors and political factors are influencing biodiversity conservation and livelihoods endeavours in the various protected areas in Zimbabwe, including the private protected areas and community-based protected areas that are the focus of this study. The recognition of political ecological factors is helpful in understanding the roles and interests of various stakeholders in environmental management, and this is important for the establishment of more effective natural resource management arrangements.

CHAPTER THREE: LITERATURE REVIEW

3.1 Introduction

This chapter critically examines and discusses information and findings currently available in the domain of biodiversity conservation and rural development. The selection of literature for discussion in this chapter was guided by the objectives of the study. The review exercise also discloses some gaps requiring further investigation within the current body of literature on conservation and rural development.

3.2 Key terms and concepts

3.2.1 Biodiversity

The term 'biodiversity' became a buzzword in conservation circles towards the end of the 1980s (Agrawal and Redford, 2006; Blackmore and Reddish, 1996; Cardinale et al, 2012; Hill et al, 2013; Laurance et al, 2014). Although the term biodiversity is rather new, the origins of the concept go far back in time (Heywood, 1995). A contraction of the term 'biological diversity', biodiversity is a concept that embraces the whole array of life forms and their components from genes, through species to habitats and ecosystems (Blackmore and Reddish, 1996; Hambler, 2004; Sandava et al, 2011). It is the totality of genes, species and ecosystems inhabiting a region, and ultimately encompasses the number, variety and variability of life on earth (Agrawal and Redford, 2006; Barbault, 2011; Gaston, 1996; Heywood, 1995; Mader, 2007; Rands et al, 2010). The term biodiversity has progressed to becoming a powerful symbol for the full richness of life on earth and is now a major driving force behind efforts to reform land management and development practices worldwide and to establish a more harmonious relationship between people and nature (Noss and Cooperrider, 1994; Russell et al, 2011).

The Convention on Biological Diversity (CBD), born out of the 1992 Earth Summit, provides a fuller definition of biodiversity by stating that it is "the variability among living organisms from all sources, including among others, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (Hambler, 2004: 11). This all-embracing definition includes the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological processes that keep

them functioning (Barbault, 2011; Gaston, 1996; Hambler, 2004; Noss and Cooperrider, 1994; Pruitt and Underwood, 2006; Sandava et al, 2011).

One of the greatest scientific challenges today involves the measurement of biodiversity (Agrawal and Redford, 2006; Barbault, 2011; Hambler, 2004; Mader, 2007), prompting Guyer and Richards (1996 cited in Brown, 1998: 75) to state that biodiversity is "quantitative without necessarily being quantifiable". This challenge also appears to be most urgent because, with many species becoming extinct without trace, humanity may never know how many species ever existed on the earth (Hambler, 2004). Some of the levels or measures of biodiversity commonly used include the following:

Genetic diversity: Genes are the sequences of the DNA (deoxyribonucleic acid) molecule and serve as the functional units of heredity (Noss and Cooperrider, 1994; Russell et al, 2011). Genetic diversity refers to the variation of genes within a species (Blackmore and Reddish, 1996). Species differ from one another genetically while individuals from within a species also vary largely because they have unique combinations of genes (Agrawal and Redford, 2006; Noss and Cooperrider, 1994; Pruitt and Underwood, 2006; Sandava et al, 2011). Conservation goals at the genetic level include the maintenance of genetic variation within and among populations of species, and ensuring that processes such as genetic differentiation and gene flow continue at normal rates (Noss and Cooperrider, 1994). This is crucial because without genetic variation, populations become less adaptable and their extinction more probable (Noss and Cooperrider, 1994). The aim is therefore to maintain enough individuals of a species so as to ensure that individuals are representative of the genetic variability of the species, thus maximising the gene pool (Blackmore and Reddish, 1996).

Species diversity: Although in some ways species diversity is the best known aspect of biodiversity, it is one that is also not easy to measure (Hambler, 2004; Mader, 2007). This is mainly because biologists have long debated what a 'species' actually is (Burgman, 2002; Hambler, 2004; Mace, 2004; Possingham et al, 2002). Ideally, a species is a group of organisms which can interbreed to produce a fertile offspring, and which are reproductively isolated from other species (Mader, 2007; Sandava et al, 2011). However, this definition is complicated by those species that reproduce asexually, those which can hybridise amongst the 'species' and by microorganisms such as bacteria and viruses which can exchange genetic material between very distantly related forms (Hambler, 2004). In addition, the vast majority of species in the world are still unknown and, of an estimated 10 to 100 million species on

earth, only about 1.5-1.8 million have been named by taxonomists to date (Grena et al, 2014; Sloan et al, 2014; Stork, 1997; Wilson, 1992). Conservation goals at the species or population level include maintaining viable populations of all native species in natural patterns of abundance and distribution (Noss and Cooperrider, 1994; Sandava et al, 2011).

Ecosystem/ community diversity: A community is an assemblage of species in an area and we can have terrestrial or aquatic communities (Sandava et al, 2011). An ecosystem is a biotic community plus its abiotic environment (Agrawal and Redford, 2006; Mader, 2007). Ecosystems range in scale from microcosms such as a small pool to the entire biosphere (Noss and Cooperrider, 1994). In most cases, conservation is most efficient when focused directly on the community or ecosystem and should complement species level management (Cumberlidge et al, 2009). The rationale for protecting ecosystems is compelling just because if intact and ecologically functional examples of each type of ecosystem in a region can be maintained, then the species that live in these ecosystems will also survive and persist (Mader, 2007; Noss and Cooperrider, 1994). Practising conservation at the community or ecosystem level thus demands attention to ecological processes (Butchart et al, 2010; Thuillera et al, 2008).

Landscape and regional diversity: A landscape can be defined as a heterogeneous land area composed of a cluster of interacting ecosystems that is repeated in similar form throughout (Forman and Godron, 1986). The term ‘region’ or ‘bioregion’ or ‘ecoregion’ refers to large landscapes that can be distinguished from other regions on the basis of climate, physiography, soils, species composition patterns (biogeography), and other variables (Noss and Cooperrider, 1994). Landscape or regional diversity is pattern diversity (the pattern of habitats and species assemblages over large areas) and is thus a higher level of expression of biodiversity (Noss and Cooperrider, 1994). The primary conservation goal at the landscape or regional level is to maintain complete, unfragmented environmental gradients (Butchart et al, 2010; Cumberlidge et al, 2009).

Cultural or social diversity: During the Keystone Dialogue on Biological Diversity some participants insisted that human cultural or social diversity be included in the definition of biodiversity and in any strategy for its conservation (Noss and Cooperrider, 1994; Keystone Centre, 1991). The Global Biodiversity Strategy also clearly states that human cultural diversity should be considered as part of biodiversity (World Resources Institute - WRI/ IUCN/ United Nations Environment Programme - UNEP, 1992). Cultural diversity is

manifested by diversity in language, religious beliefs, land-management practices, art, music, social structure, crop selection, diet, and any other attributes of human society (Noss and Cooperrider, 1994).

At face value, the inclusion of cultural diversity in a definition of biodiversity is important because humans are fundamentally as much part of nature as any other species and share kinship and ecological interactions with all life (Hambler, 2004; Noss and Cooperrider, 1994). On closer examination, it is, however, not helpful to make the definition of biodiversity so inclusive, simply because culture changes and also because the protection of culture and the protection of non-human species may sometimes be in conflict (Hambler, 2004). Noss and Cooperrider (1994) further note that including human diversity within the definition of biodiversity would trivialise the concept of biodiversity and make it unworkable. Such an all-inclusive definition would allow any city in the world to be considered on equal footing with, for example, the Great Barrier Reef of Australia thereby making impossible any coherent discussion of biodiversity conservation (Noss and Cooperrider, 1994). What would probably be workable would be to conserve all cultural approaches that are compatible with the conservation of biodiversity (Cumberlidge et al, 2009; Hambler, 2004; Noss and Cooperrider, 1994). For the above cited reasons, and probably many others, this study does not include cultural diversity within the definition of biodiversity.

3.2.2 Conservation

Like many other definitions, it is difficult to find a definition of the term ‘conservation’ which suits everybody. The word has been used in connection with nature for about a century now after Theodore Roosevelt popularised its use in the United States of America (USA) as “the wise use of the Earth and its resources” (Hambler, 2004: 2). The World Conservation Strategy defines conservation as the management of the use of the biosphere so that it may yield the greatest sustainable benefit to the present generations while maintaining its potential to meet the needs and aspirations of future generations (Hambler, 2004). The three main aims of the World Conservation Strategy are: to maintain essential ecological processes and life-support systems; to preserve genetic diversity; and to ensure the sustainable utilisation of species and ecosystems (Hambler, 2004). Some conservationists have, however, criticised the above definition because it is centred on the usefulness of nature to humans, rather than on protecting nature for its own sake (Doak et al, 2014; Hambler, 2004; Maynard et al, 2014; Noss and Cooperrider, 1994).

Biodiversity conservation has become a mainstream political issue since the publication of the Brundtland Report, *Our Common Future* by the World Commission on Environment and Development in 1987, followed by the convening of the UNCED or Earth Summit in Rio de Janeiro in 1992 (Cardinale et al, 2012; Dunn et al, 2014; Hooper et al; 2012; Jeffries, 2006; Mace and Baillie, 2007; Yoshioka et al, 2014). Since then, various international and national mechanisms and treaties have been put in place to help achieve conservation more successfully (Dunn et al, 2014; Galli et al, 2014). It is however important to note that although the rise in global interest in conservation is recent, the concept has a very long history spanning several millennia (Agrawal and Redford, 2006), as shall be shown later in this chapter.

The need to conserve biodiversity emanates from the tremendous and ever increasing capacity of humans, mainly through technological advances and rapidly increasing populations, to modify, simplify and homogenise natural systems, which in turn has huge potential to drive many species into extinction (Adams, 2004; Agrawal and Redford, 2006; Babigumira et al, 2014; Brockington et al, 2008; Brook et al, 2014; Doak et al, 2014; Fuggle, 1999; Hou et al, 2014; Rands et al, 2010; Sandava et al, 2011).

3.2.3 Livelihoods

Livelihoods can be defined as the ways in which people make a living (Bennett and Dearden, 2014; Chambers and Conway, 1992; Ferrol-Schulte et al, 2013; Fisher et al, 2013; Fisher et al, 2005). Livelihoods contribute to human well-being and hence reduced or limited livelihood opportunities will lead to poverty (Angelsen et al, 2014; Bennett and Dearden, 2014; Chambers and Conway, 1992; Fisher et al, 2005; Jacob et al, 2013; Scoones, 1998; Scoones, 2009). It therefore follows that rural livelihoods encompass the various ways in which rural people make a living. The concept of livelihoods was discussed in greater detail in Chapter Two.

3.2.4 Poverty

Research on poverty alleviation enjoys a long pedigree, with questions about how to address poverty increasingly becoming urgent and ubiquitous, especially after the Second World War and with decolonisation (Agrawal and Redford, 2006; Redford et al, 2008; Romero et al, 2012). According to Fisher et al (2005), there are many definitions of poverty and with them, also many suggested strategies for solving it. Poverty is often defined in absolute terms by economists through the use of the poverty line, which is the level of per capita consumption

that permits an individual to satisfy basic nutritional requirements (Bergh and Nilsson, 2014; Chen and Ravallion, 2008; Fisher et al, 2005; Kanbur and Sumner, 2012; Roe and Elliot, 2005; Sumner, 2010; Vira and Kontoleon, 2010). Currently, the notional poverty line of US$ 1 per day is being used to reflect a person's ability to afford a diet sufficient to meet minimal nutritional needs, and was the basis for calculating the current 1.2 billion chronically poor people of the world living on less than a dollar per day (Bergh and Nilsson, 2014; Ramchandani and Karmarkar, 2014; Roe and Elliott, 2005; Scherr et al, 2003; Sumner, 2010; Vira and Kontoleon, 2010). However, though a useful indicator, absolute poverty seems to be a blunt instrument for measuring a phenomenon as complex as poverty (Agrawal and Redford, 2006; Fischer, 2010; Perera and Lee, 2013; Ramchandani and Karmarkar, 2014; Roe and Elliott, 2005), with questions arising about what such a measurement does not and cannot tell (Fisher et al, 2005; Kanbur and Sumner, 2012). For example, while the measurement of absolute poverty may reveal something about physical well-being, it cannot tell the underlying causes of poverty or the significance of power structures and processes in producing and reproducing it (Fischer, 2010; Fisher et al, 2005). In addition, Roe and Elliott (2005) note that people's perceptions of poverty tend to change as countries get richer, with the definition of poverty thus dependent on what people, in a particular society and at a particular point in time, perceive as being poor.

The above and other shortfalls inherent in absolute measures of poverty have led to a growing recognition that poverty is a complex, multi-faceted condition involving several, usually interconnected, economic and social dimensions along which it manifests itself (Agrawal and Redford, 2006; Bergh and Nilsson, 2014; Fischer, 2010; Perera and Lee, 2013; Scherl et al, 2004). Such dimensions include (Scherl et al, 2004: 15-16):

- lack of assets and income;
- lack of opportunities to engage in productive activities that can sustain livelihoods;
- lack of voice and empowerment, and exclusion from decision-making processes, governance systems and legal recourse;
- vulnerability to human-made and natural disasters, ill-health, and economic shocks; and
- lack of capacity to promote and defend community interests.

Communities located where the above dimensions overlap and reinforce each other often face the greatest development challenges (Jagger et al, 2014; Scherl et al, 2004). The dimensions

of poverty have been succinctly summarised in tabular form (Table 3.1) by the World Bank (2001 cited in Fisher et al, 2005: 40).

Table 3.1: Dimensions of poverty

Lack of assets	**Powerlessness**	**Vulnerability**
Assets include: - natural capital - human capital - financial capital - physical capital - social capital	Powerlessness caused by: - social differences (including gender) - inequitable access to resources - unresponsive public administrations - corruption - inequitable legal systems	Multiple risks resulting from: - economic crises - natural disasters - social crises

Source: World Bank (2001 cited in Fisher et al, 2005: 40)

Correspondingly, strategies to address poverty need to incorporate a suite of objectives and actions if they are to be effective (Agrawal and Redford, 2006; Perera and Lee, 2013). The World Bank (2001 cited in Fisher et al, 2005: 41) has also devised a three-pronged strategy for poverty reduction centred on building assets by providing opportunities for growth, empowerment, and increased security (Table 3.2).

Table 3.2: Some dimensions of poverty reduction

Opportunities and growth	**Empowerment**	**Security**
Expanding assets of the poor Encouraging private investment Expanding international markets Pro-poor market reform Restructuring aid Debt relief	Addressing social inequalities Enhanced public participation in decision-making Pro-poor decentralisation Public administration reform Legal reform Providing forums for debate	Risk management Safety nets Coping with natural disasters

Source: World Bank (2001 cited in Fisher et al, 2005: 41)

It is worth noting that after more than a decade of the World Bank acknowledging key causes of poverty and identifying strategies to intervene, as noted earlier, poverty has increased and challenges remain. In some instances conditions have significantly worsened and as a result of several threat multipliers in Africa, as shown by Bob and Bronkhorst (2014), such as climate change and corruption, this is likely to become even more devastating.

According to Scherl et al (2004), stewardship of natural resources upon which many rural communities depend is vital for strengthening resilience among the poor. There is

increasingly an acknowledgement that protected areas can and should play a significant role towards poverty reduction among the rural poor (Buta et al, 2014; Chan et al, 2007; Meilby et al, 2014; Scherl et al, 2004; Turner et al, 2012).

3.2.5 Conservation-development initiatives

The failure of conventional approaches to promote rural development in many parts of the developing world has witnessed the introduction and trial of various other poverty reduction initiatives (Dercon, 2009; Dorward et al, 2004). One such initiative, which attempts to pursue conservation coupled with social development (Agol et al, 2014; Bu¨scher, 2013; Chan et al, 2007; Miller, 2014; Pinho et al, 2014; Redford et al, 2008; Salafsky, 2011; Schoneveld, 2014; Walpole and Wilder, 2008; Zhang et al, 2014), has gained popularity across the developing world among conservationists and various development agencies.

Discussions on the links between livelihoods, poverty and conservation are, however, not particularly new (Fisher et al, 2005). The need to take livelihoods and poverty into account in conservation activities has since been expressed by many conservationists, finally culminating in the 1970s into Integrated Conservation and Development Projects (ICDPs) and community-based conservation and resource management (Agrawal, 2014; Blom et al, 2010; Dyer et al, 2014; Fisher et al, 2005; García-Amado et al, 2013). While ICDPs have not been quite successful mainly due to some flawed assumptions and weak implementation (Agol et al, 2014; Bauch et al, 2014; Blom et al, 2010; McShane and Wells, 2004), recent years have witnessed the emergence of various relatively more effective new-generation ICDPs including community conservation (Barrett et al, 2011; Fisher et al, 2005; Pagiola et al, 2005; Roe and Elliott, 2006).

3.3 Downward trends in the biosphere

Throughout the world, increasing interest is being expressed in environmental issues, largely as a result of the serious concern that is felt about the present state of both the local and global environment (Heywood, 1995; Laurance et al, 2014; Maynard et al, 2014; Yoshioka et al, 2014). Since the second half of the 20th century, the relationship between human beings and the natural environment has become a topic of widespread concern (Cardinale et al, 2012; Fuggle, 1999; Hooper et al 2012; Laurance et al, 2014). It is now universally accepted that, according to present trends, the world must be expected to become more crowded, more polluted, less ecologically stable, and more vulnerable to natural hazards (Dunn et al, 2014; Fuggle et al, 1999; Galli et al, 2014). The present time is different from any other in history

because of the rates at which humans are using resources, modifying natural systems, and increasing in their numbers (Fuggle, 1999; Hooper et al, 2012; Pruitt and Underwood, 2006; Sandava et al, 2011). In other words, the world is experiencing an environmental crisis.

One facet of the current global environmental crisis is the loss of biodiversity (Russell et al, 2011). Brockington et al (2008: 50) note that "the most urgent imperative voiced by conservationists is the need to preserve biodiversity and combat the extinction crisis". By even the most conservative estimates, progressive degradation of ecosystem structure and function, with its associated loss of species, is occurring at an alarming rate due to a wide range of human activities (Sandava et al, 2011; Wilshusen et al, 2003). Most scholars and conservation practitioners point to the increasing number of species extinctions as a clear indication of a biodiversity crisis (Belk and Borden, 2008; Dunn et al, 2014; Russell et al, 2011; Wilshusen et al, 2003). In spite of key gains in policy development, political participation, financial support and programme implementation throughout the world; the earth still faces an alarming downturn in its diversity of life (Barrett et al, 2011; Dunn et al, 2014; Galli et al, 2014; Pfund, 2010; Rands et al, 2010; Wilshusen et al, 2003). While extinction has always existed as a natural process, it has currently become a primarily human-sourced phenomenon especially since the second half of the 20th century due to increased human interaction with, and manipulation of, biological resources (Sandava et al, 2011; Swanson, 1997). Habitat loss and degradation represent the leading threats to species, with the last 30-40 years witnessing major changes in the quantity and quality of tropical forests (Babigumira et al, 2014; Galli et al, 2014; Gardner et al, 2009; Laurance et al, 2014; Sloan et al, 2014; Wilshusen et al, 2003). Pfund (2010) notes that deforestation rates are not decreasing in tropical forests while biodiversity hotspots appear under-protected. It is estimated that one-fifth of all tropical forest cover was lost between 1960 and 1990 (Barrett et al, 2011; Morris, 2010; Wilshusen et al, 2003). A study by the IUCN in 2000 revealed that changes in habitat affected 89% of all threatened birds, 83% of mammals and 91% of threatened plants that were assessed (Babigumira et al, 2014; Brook et al, 2014; Hou et al, 2014; Wilshusen et al, 2003).

The IUCN Red List of Threatened Species has been documenting the threat status of flora and fauna for more than 40 years and is widely considered to be the most comprehensive dataset on the conservation status of species worldwide (Clausnitzer et al, 2009; Galli et al, 2014). The IUCN-World Conservation Union Species Survival Commission has a Red List programme that defines 8 categories of threat on biodiversity (Adams, 2004; Brockington et

al, 2008; Clausnitzer et al, 2009; Rodrigues et al, 2006). The Red List also assesses the status of living species on the basis of assessments produced by panels of experts who examine the numbers and viability of as many of the world's organisms as they can (Brockington et al, 2008; Rodrigues et al, 2006). The IUCN Red List has recorded that altogether 360 vertebrates, 373 invertebrates (of which 303 are molusks) and 110 plants are listed to having gone extinct since 1500 (Brockington et al, 2008).

Given the high levels of ignorance surrounding precisely how many species there actually are, it is widely feared that far more species have disappeared, or are threatened than those recorded (Brockington et al, 2008; Galli et al, 2014). This has prompted some conservation biologists and other researchers to come up with higher predicted yearly losses. For example, there are reports indicating that hundreds of thousands of species were being lost annually (Mann, 1991; Sandava et al, 2011). Another prediction by Ehrlich and Wilson (1991) suggested that the loss of tropical forests alone was removing between 4 000 and 40 000 species per year, while Dirzo and Raven (2003) have estimated that over 1 000 extinctions are occurring per million species per year.

Brockington et al (2008), however, note that the study of species extinctions is a very complex science. While it is beyond any doubt that extinctions are occurring, proving that they have occurred is a difficult task (Brockington et al, 2008). The sighting of species that had been declared extinct demonstrates the above challenge (Brockington et al, 2008; Jeffries, 2006; Seddon et al, 2014). It is even more difficult to state extinction rates as a proportion of existing species simply because the actual number of species on the planet is not known (Brockington et al, 2008).

In addition, the utility of the IUCN Red Lists has been questioned partly as a result of the instability of the definition of species on which the lists depend (Burgman, 2002; Clausnitzer et al, 2009; Galli et al, 2014; Hambler, 2004; Mace, 2004; Possingham et al, 2002; Rodrigues et al, 2006). Some of the criticisms against the Red List Categories are summarised below (Jeffries, 2006: 137):

- *Bias:* The categories contain only known species. The undiscovered ones plus species found but not yet described are omitted. The great majority of species are therefore excluded and the published lists could divert attention from this unknown majority.

- *Species based:* The Red Lists deal with individual species. There is no attempt to assess the threat to higher taxonomic levels, which may represent more fundamental differences and variety or specialness.
- *Lack of objectivity:* The superficially neat, objective classification is based on expert opinion, and so is subjective. Risk is poorly quantified, such as percentage risk of extinction over a defined time period.
- *Some criteria are not linked to threat:* Red List classification can be based on protection accorded to a species or unhelpful criteria, for example, "insufficiently known" (which applies to most life on the planet). Other potentially useful data such as rate of population decline are not routinely used.

While there may be arguments among conservation biologists concerning the validity of Red Lists and extinction rates, one thing they all, or most of them, agree on is the fact that, at the current rate of human modification and manipulation of the biosphere, there is certainly an impending extinction crisis. While these arguments are important, more effort and resources should be devoted to coming up with measures aimed at reducing the loss of biodiversity. More comprehensive biodiversity assessments need to be carried out, as much as is possible, so as to come up with more reliable and more useful Red Lists.

The loss of biodiversity is brought about by a complex chain of causal factors and Turpie (2009) identifies proximate and ultimate causes of biodiversity loss (Figure 3.1). The proximate causes of loss include overexploitation of natural resources, invasion by alien species, pollution, climate change, alteration of hydrological systems and habitat alteration and loss (Babigumira et al, 2014; Brook et al, 2014; Butchart et al, 2010; Hou et al, 2014; Laurance et al, 2014; Rands et al, 2010; Turpie, 2009). These processes are the ones which directly lead to biodiversity loss. On the other hand, the ultimate causes of biodiversity loss are socio-economic in nature and "include market failure and policy distortions which distort the way in which biodiversity losses are accounted for in decision-making; the extremes of wealth and poverty, which lead to destructive patterns of consumption and dependency on natural resources; consumer attitudes and preferences, which are influenced by changing ethics in a modern world; and human population dynamics, which lead to imbalances between the demand for the goods and services provided by biodiversity" (Turpie, 2009: 39).

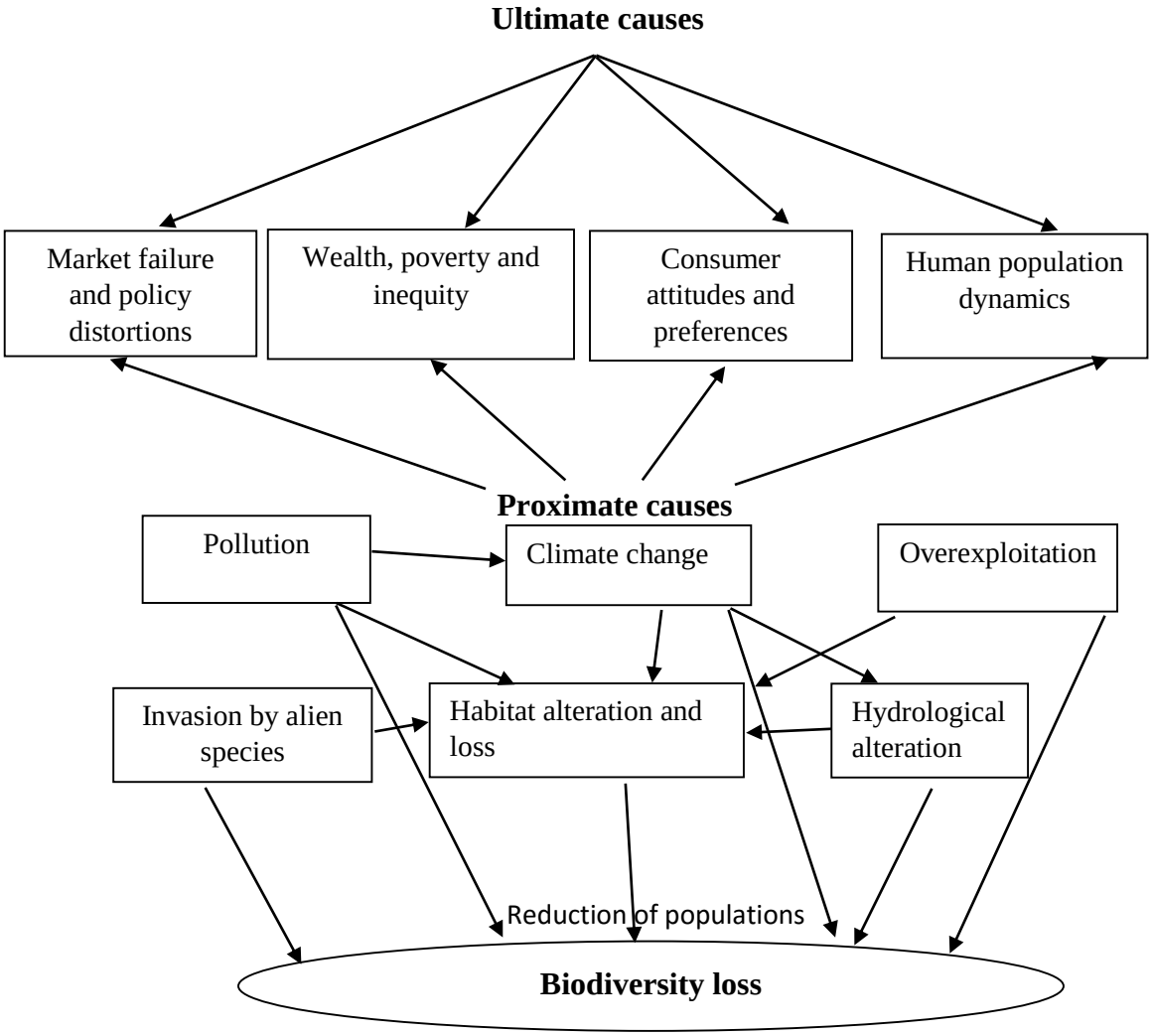

Figure 3.1: The proximate and ultimate causes of biodiversity loss
Source: Turpie (2009: 39)

As Figure 3.1 shows, biodiversity maintenance can be achieved through action at two levels. Action at the proximate level is necessary to combat losses of biodiversity in the short-term, while action at the ultimate level seeks to prevent future losses and relieve the pressures on biodiversity in the long-term (Turpie, 2009). Ultimately, the successful conservation of biodiversity relies on an in-depth and holistic understanding of the causal chain of biodiversity loss and the most effective points and types of intervention to reverse the process (Brook et al, 2014; Thuillera et al, 2008; Turpie, 2009).

3.4 Why biodiversity matters: valuing biodiversity

The preceding section has shown that there is a downward trend in global biodiversity and it has also been suggested that measures should be adopted so as to address this impending

biodiversity crisis. A question which lingers on, however, is why worry about biodiversity decline? This section explores the various value justifications for saving nature, including the limitations inherent in some of them. The value of biodiversity has generally been categorised into two groups, namely, use values and non-use values and these shall now be examined below.

3.4.1 Use values of biodiversity: utilitarianism

Use values of biodiversity represent the present and potential practical values of elements of biodiversity to humankind (Blackmore and Reddish, 1996). These can further be sub-divided into direct and indirect values (Blackmore and Reddish, 1996; Mader, 2007) discussed below.

3.4.1.1 Direct use values: the resource-based argument

Direct use values are those concerned with the enjoyment or satisfaction received directly from biodiversity (Blackmore and Reddish, 1996; Maynard et al, 2014). This kind of value is the easiest to appreciate as many people value things largely for their direct utility for humans (Noss and Cooperrider, 1994; Pinto et al, 2014). Noss and Cooperrider (1994) further argue that, although the direct use values are incomplete as a justification for saving biodiversity, such values are real as shown below.

Food: Food is arguably the most important direct use of biodiversity (Belk and Borden, 2008; Brussaard et al, 2010; Kunin and Lawton, 1996; Phalan et al, 2011; Sangeethapriya and Siddhuraju, 2014). This food takes forms that include vegetables, fruits, nuts, grains, meat, honey, and adjuncts to food in the form of food colourants, flavourings and preservatives (Gaston and Spicer, 2004; Russell et al, 2011; Sandava et al, 2011). Of the estimated 300 000 species of flowering plants, about 12 500 are considered to be edible to humans, although occasional use may embrace a much larger number, with around 200 plant species having been domesticated for food (Gaston and Spicer, 2004; Maxted et al, 2010). Wild food sources still play a significant role in meeting the nutritional needs of people in many of the world's poorest nations (Akinnifesi et al, 2006; Chavas, 2009; Kunin and Lawton, 1996; Maxted et al, 2010; Sangeethapriya and Siddhuraju, 2014; Scho¨nfeldt and Pretorius, 2011; Shumsky et al, 2014; Sukara, 2014; Uusiku et al, 2010; Vedeld et al, 2007). Di Falco and Chavas (2009) have reported on the value of biodiversity as insurance against yield variability and also against total crop failure. Even in the developed world where most of the foods eaten come from domesticated species, food supplies are critically dependant on wild populations, and a

significant percentage continues to be foraged from the wild (Groombridge 1992; World Bank, 2007a).

The diversity of organisms exploited for food remains narrow when compared with their overall diversity, leaving significant potential for further exploitation (Baumgartner and Quaas, 2008; Belk and Borden, 2008; Gaston and Spicer, 2004; Nesbitt et al, 2010; UNDP/ UNEP/ World Bank/ WRI, 2000; Zenteno et al, 2013). This gap is, however, being closed indirectly through the use of wild species and varieties to supply genes for the improvement of cultivated and domesticated species for increasing yields, tolerances, vigour, and disease and pest resistance (Gaston and Spicer, 2004; Maxted et al 2010). Thus, wild animal and plant species provide an enormous reservoir of genetic diversity which is the foundation of agriculture and provides for its continued support (Maxted et al, 2010).

Medicine: The World Health Organisation (WHO, 1998) defines human health as a state of total physical, mental and social well-being and not just the absence of disease or infirmity. In addition to providing sustenance as shown above, biodiversity plays other direct and indirect roles in maintaining the health of the human population (World Bank, 2007a).

Vira and Kontoleon (2010) identify two main avenues through which biodiversity provide a means for mediating health risk for the poor. The first has to do with the impact that biodiversity has on reducing the risk of infectious diseases, while the second has to do with biodiversity as a source of accessible medicinal regimens which are not only curative but are also preventive, thereby reducing health risks (Chivian and Bernstein, 2008; Johns, 2006; Vira and Kontoleon, 2010). At the ecosystem level, biodiversity produces the appropriate balance between predators and prey, hosts, vectors and parasites which allows for appropriate controls and checks for both the spread of endemic infectious diseases as well as resistance towards invasive pathogens (Vira and Kontoleon, 2010). Ash and Jenkins (2007) identify many diseases that are particularly dependent on changes in ecosystem biodiversity, with many of these diseases being particularly relevant to the poor including malaria, schistosomiasis, meningitis, cholera, dengue and lymphatic filariasis. Biodiversity not only plays the role of reducing the risk of such diseases spreading within an ecosystem and the human populations within it, but also reduces the risk of allowing invasive diseases from entering a particular system (Vira and Kontoleon, 2010). For example, Ash and Jenkins (2007) reported that cholera, kala-azar, and schistosomiasis have not established in the biodiverse Amazonian forest ecosystem in spite of human migration and settlements.

Biodiversity has proven to be an important source of traditional medicines for people in developing countries, particularly those in remote and normally more poverty-stricken areas of the developing world where access to formal health care is limited (Cordell, 2014; Shah et al, 2014; Vira and Kontoleon, 2010). It is estimated that approximately 75% of the world's population depends primarily on traditional medicines gathered from wild natural products (Vira and Kontoleon, 2010). Indeed, natural products have long been recognised as an important source of therapeutically effective medicines in many parts of the world (Harvey, 2000). Though traditional medicines may not be as effective as scientifically tested drugs, they provide a cost-effective and accessible option in poverty stricken-communities (Ash and Jenkins, 2007; Cordell, 2014; Shah et al, 2014; Vira and Kontoleon, 2010).

In addition, biodiversity has played, and continues to play, a significant role in modern medicine (Amirkia and Heinrich, 2014; Nair et al, 2011; Sukara, 2014; Szewczyk and Zidorn, 2014). For example, of 520 new drugs approved between 1983 and 1994, 39% were natural products or were derived from them (Gaston and Spicer, 2004). Moreover, of the 20 best-selling non-protein drugs in 1999, 9 were derived directly or indirectly from natural products, with combined annual sales of more than US$16 billion (Gaston and Spicer, 2004). Noss and Cooperrider (1994) note that nearly 3 000 antibiotics have been derived from microorganisms. Twenty three percent of the compounds in the 150 most commonly prescribed drugs in the USA in the 1990s came from animals while, since the mid-1980s, over 2 500 medically significant chemical compounds have been found in marine species (Stolton, 2010a). Animals are also used as models on which to test potentially useful drugs or techniques (Gaston and Spicer, 2004), though such practices may be morally questionable.

Despite advances in computer-assisted drug design, molecular biology and gene therapy, there remains a pressing need for new drugs and biological materials will continue to play a major role (Amirkia and Heinrich, 2014; Gaston and Spicer, 2004; Nair et al, 2011). For example, one in every 125 plant species studied has produced a major drug, while for synthesised chemicals, the potential for finding major new drugs is of the order of one in 10 000 compounds tested (Dobson, 1995; Gaston and Spicer, 2004).

Just as with food above, the proportion of species that have been investigated for potential derivation of drugs is quite small (Lall and Kishore, 2014; Stolton, 2010a). For example, as of 1995, whilst about 37 500 species of plants had been studied photochemically, only about 14 000 had been studied for at least one type of biological activity (Sukara, 2014; Verpoorte,

1998). This shows that there is still vast potential for deriving more drugs from biodiversity. The medicinal value of plants and animals, both current and future, therefore provides a powerful argument for their conservation, just as with their value as a source of food for people.

Industrial materials: Biological diversity also has immense industrial value (Belk and Borden, 2008; Guittonny-Philippe et al, 2014; Kunin and Lawton, 1996; Kurian et al, 2013; Quirósa et al, 2014; Sandava et al, 2011; Tofalo et al, 2014), with a wide range of industrial materials, or templates for their production, being derived directly from biological resources (Gaston and Spicer, 2004; Pegoretti et al, 2014). These include building materials, fibres, dyes, resins, gums, adhesives, rubber, oils and waxes, and perfumes (Kunin and Lawton, 1996; Pegoretti et al, 2014). Many agricultural chemicals including herbicides, fungicides and insecticides are also derived from natural products, or synthesised using natural chemicals as templates (Kunin and Lawton, 1996).

Biological materials have provided the models (biomimicry) for many industrial materials and structures (Gaston and Spicer, 2004). For example, inspiration for the dome of the Crystal Palace in London came from the Amazonian water lily *victoria amazonica*, air conditioning systems from the mounts constructed by termites, the echo-sounder from bats, and infrared sensors from the thermosensitive pit organ of the rattle snake (Gaston and Spicer, 2004; Kunin and Lawton, 1996). As is the case with food and medicine, the scope for exploitation of a far greater diversity of organisms for industrial materials is vast, and for that reason, biological resources cannot be allowed to go into extinction. However, it is important to note that most of the industrial uses of biodiversity have also immensely contributed to the degradation of the earth's biological resources.

Ecotourism: Ecotourism is by definition tourism founded on biodiversity, and has developed into a massive industry (Bayliss et al, 2014; Borgerhoff Mulder and Coppolillo, 2005; Leisher et al, 2010; Tyrväinen et al, 2014). Donohoe and Needham (2006: 192) note that "ecotourism has consistently grown and is now widely considered the fastest growing sub-component of the world's largest industry - tourism". According to Fillion et al (1994), an estimated 157-236 million people took part in international ecotourism in 1988, while in 1998, an estimated 9 million people went for whale watching alone, with expenditure on just this activity totalling US$1 billion (Hoyt, 2000; Weaver and Lawton, 2007). According to the UN World Tourism Organisation (UNWTO, 2014), international tourist arrivals grew by an

estimated 5% in 2013 (above the long-term forecast of 3.8% per year between 2010 and 2020), reaching a record 1 087 million despite sluggish global economic growth and numerous geopolitical challenges. The UNWTO (2014) further notes that international tourism receipts generated a total of US$1 079 billion (Euro 840 billion) in 2012.

The arguments for conserving biodiversity based on utility are, however, limited. The major weakness with a conservation system wholly based on economic motives is that most members of the biological community do not have economic value (Doak et al, 2014). Conservationists often fall into the trap of justifying species preservation for utilitarian purposes, thereby sanctioning the humanistic attitude that is responsible for the biodiversity crisis (Maynard et al, 2014; Noss and Cooperrider, 1994). The attitude implied by economic valuations of biodiversity is that the worth of a species depends on its direct utility to humans, and if a species is of no benefit to them, then it is worthless (Braat and de Groot, 2012; Noss and Cooperrider, 1994). This predisposes species to extinction.

At best, the utilitarian argument for biodiversity conservation is a double-edged sword (Noss and Cooperrider, 1994). Under certain circumstances, it might help gain public support for protecting species and ecosystems, while in other cases it can be used to justify the destruction or neglect of seemingly worthless life forms (Noss and Cooperrider, 1994). In both cases, it encourages disrespect for species in and of themselves (Braat and de Groot, 2012; Maynard et al, 2014; Noss and Cooperrider, 1994). It is also quite disturbing to note that current arguments for maintaining international biodiversity, such as those expressed in the Global Biodiversity Strategy, are thoroughly utilitarian, hanging almost entirely on presumed benefits of biodiversity to humans (Doak et al, 2014; Holden et al, 2014; Noss and Cooperrider, 1994; WRI/ IUCN/ UNEP, 1992). The sustainable development theme of the Global Biodiversity Strategy, and related international conservation programmes, is thus potentially dangerous for the survival of biodiversity if strict protection to sensitive areas is not part of the programme (Holden et al, 2014; Noss and Cooperrider, 1994; Robinson, 1993).

3.4.1.2 Indirect use values: ecosystem services

Natural ecosystems and biodiversity also provide benefits to humans that are indirect, yet essential (Rands et al, 2010). These have been termed ‘ecosystem services’ and include, among others, (Ehrlich and Ehrlich, 1981; Hill et al, 2014; Hou et al, 2014; Pinto et al, 2014):

- Maintaining atmospheric quality by regulating gas ratios and filtering dust and pollutants
- Regulating freshwater supplies and controlling flooding
- Generating and maintaining soils through the decomposition of organic matter and the relationship between plant roots and mycorrhizal fungi
- Breaking down of wastes, including domestic sewage and wastes produced by industry and agriculture
- Cycling of nutrients
- Controlling pests and diseases, for example, through predation and parasitism on herbivorous insects
- Pollinating crops and useful wild plant species by insects, bats, hummingbirds and other pollinators

The biota annually cycles elements such as carbon, hydrogen, nitrogen, oxygen, phosphorous and sulphur and huge quantities of aerosols and particles among the atmosphere, hydrosphere and lithosphere (Dudley et al, 2010a; Mader, 2007; Pinto et al, 2014; Rands et al, 2010). Such biochemical cycling modifies physical and chemical conditions, creating an environment that sustains life (Dudley et al, 2010a; Higgins-zogib et al, 2010; Hill et al, 2014). According to Gaston and Spicer (2004), in the absence of life, earth would be a very different planet. In particular, it has been estimated that the atmospheric gas composition would be radically altered, and surface temperatures and pressures drastically heightened (Gaston and Spicer, 2004; Lovestock, 1989).

Biodiversity is crucial in regulating freshwater supplies and controlling flooding. While, in theory, water is a quintessentially renewable resource, several factors have turned freshwater into a scarce commodity (Dudley and Hamilton, 2010). Due to rapid human population growth and the increasing demands for water, pollution, and careless use, the provision of safe supplies is now a major source of concern, expense, and international and intranational tension (Dudley and Hamilton, 2010; Hill et al, 2014). Until recently, the main focus of efforts to improve urban water sanitation and supply have been on better distribution systems, treatment plants and sewage disposal (Dudley and Hamilton, 2010). While the above are still of major importance, there is also increasing interest in the opportunities for purifying urban water through the management of natural resources (Dudley and Hamilton, 2010; Guittonny-Philippe et al, 2014; Hill et al, 2014; Pinto et al, 2014). A survey carried out for World Wide

Fund for Nature (WWF) and World Bank in 2003 found that about a third of the world's largest cities obtain a significant proportion of their drinking water directly from protected areas (Dudley and Hamilton, 2010; Dudley and Stolton, 2003). On the other hand, several of the top 100 cities are experiencing problems with water supply due to degradation or pollution in watersheds (Dudley and Hamilton, 2010). It is important to note that it is usually cheaper to prevent water from becoming polluted than to clean it up afterwards (Dudley and Hamilton, 2010; Guittonny-Philippe et al, 2014).

Poor rural communities face serious risk from natural hazards, the most common of these being floods, fires, hurricanes and storms, and landslides (Vira and Kontoleon, 2010). Lack of formal insurance mechanisms against such hazards among the poor has resulted in increased vulnerability and poverty (Dercon, 2006; Vira and Kontoleon, 2010). It is important to note that more people are affected by natural disasters than by war (Christian Aid, 2007). For example, at least 36 million people were displaced by natural disasters in 2008, including over 20 million displaced by climate-related disasters such as floods (UN Office for the Coordination of Humanitarian Affairs, 2009). Under such conditions, natural ecosystems can play an important role in mitigating these risks to the poor as they provide cost-effective insurance (Ash and Jenkins, 2007; Vira and Kontoleon, 2010). For instance, the protecting of forests for the purpose of controlling flooding is increasingly becoming a major environmental service (Hulea and Bratrich, 2010; Randall et al, 2010). Wetlands and forests can act as giant sponges to soak up moisture during rainy periods and release water slowly during dry periods (Randall et al, 2010). Under such circumstances, the importance of biodiversity, and the need to protect it, cannot be over-emphasised. Biological pest control is also increasingly becoming popular as awareness of the detrimental effects of agrochemicals increases, and as such chemicals become unaffordable to poor rural farmers (Chaplin-Kramer et al, 2013; Crowder and Jabbour, 2014).

3.4.2 Non-use values of biodiversity: ethics and aesthetics

As shown earlier, resource-based arguments for the maintenance of biodiversity focus on relatively few species and therefore the fundamental justification for striving to maintain all species cannot be linked to such arguments (Blackmore and Reddish, 1996; Maynard et al, 2014), but is usually based on ethics and aesthetics (Minteer and Miller, 2011; Noss and Cooperrider, 1994). Non-use value is that value associated with biological resources even if they are not directly or indirectly exploited, and these can be divided into at least four

components: option value, bequest value, existence value and intrinsic value (Gaston and Spicer, 2004; Glenn et al, 2010).

3.4.2.1 Option value: future worth

It has been revealed earlier that at present, a relatively small proportion of the world's biodiversity is being actively exploited by humans. The rest may be important in terms of values which are unused or unknown currently, but could enhance the material well-being of humans in the future if they were to be discovered and exploited (Blackmore and Reddish, 1996; Christiea et al, 2006; Glenn et al, 2010; Grimble and Laidlaw, 2002). There is, for example, huge, unexploited and currently unknown potential for the use of biodiversity, particularly with the possible medicinal, nutritional and industrial uses of much of the variety of life remaining unexploited (Blackmore and Reddish, 1996; Nesbitt et al, 2010; Zenteno et al, 2013). This potential should be valued, and may be vital as the problems faced by humanity change in nature and magnitude (Grimble and Laidlaw, 2002). As a result, society should be willing to pay to retain the option of having future access to this biodiversity (Blackmore and Reddish, 1996; Gaston and Spicer, 2004). This is particularly important for resource-dependent poor rural communities. However, it is apparently clear that the inclusion of the option value among non-use values is highly questionable as it still alludes to the utility of biodiversity to humans.

3.4.2.2 Bequest value: intergenerational equity

Closely related to, but distinct from option value, is bequest value. This is the value of passing on a resource, in this case biodiversity, intact to future generations (Gaston and Spicer, 2004; Glenn et al, 2010). This notion is embodied in the CBD where nations are encouraged to conserve and sustainably use biodiversity for the benefit of both present and future generations (Christiea et al, 2006; Gaston and Spicer, 2004; Glenn et al, 2010; UN, 1993). In her famous statement, Lester Brown, a scholar in sustainable development, noted that current generations have not inherited the earth from their parents but are borrowing it from their children (Waugh, 2009). The bequest value is at the core of the concept of sustainable development which has been defined as development that aims to meet the needs of current generations without compromising the ability of future generations to meet their needs (Brundtland, 1987; Holden et al, 2014). Thus, both intergenerational and intragenerational equity are emphasised in the above definition. The bequest value of

biodiversity is important, particularly for the rural poor highly dependent on biodiversity, who should safeguard biological diversity for future generations. However, just as with the option value above, the issue of utility to humans as the basis for biodiversity conservation is still being emphasised here.

3.4.2.3 Existence value: 'biophilia'

All the values of biodiversity presented so far in this section have been based, in one way or another, on marketable commodities and non-market goods and services. They assume that value is expressed solely in terms of the well-being of humanity (Gaston and Spicer, 2004). What these values seem to ignore is the fact that biodiversity may also have value to people irrespective of the uses to which it may or may not be put, that is, value may be placed simply on its existence (Edwards and Abivardi 1998; Gaston and Spicer, 2004; Glenn et al, 2010). According to Wilson (1984), human beings have empathy with other bearers of life which naturally disposes them to care for biodiversity in all its varied forms, and he called this 'biophilia'. The existence value of biodiversity is unassociated with actual or potential use, but reflects the satisfaction that people receive from simply knowing, for example, that there are whales in the ocean (Blackmore and Reddish, 1996; Christiea et al, 2006; Grimble and Laidlaw, 2002). They are prepared to support this financially by contributing to conservation organisations to protect them even though they do not expect to visit or use the resource they are helping to conserve (Blackmore and Reddish, 1996; Glenn et al, 2010). This apparently offers a deeper and more complete argument for protecting biodiversity unlike the utilitarian resource-based arguments presented above.

3.4.2.3 Intrinsic value: nurturing nature for nature's sake

The direct and indirect use values, as well as the option, bequest and existence non-use values of biodiversity presented above rest on human judgements of worth (Gaston and Spicer, 2004; Maynard et al, 2014). It is, however, contentious whether values can exist independently of such human judgements (Gaston and Spicer, 2004). If they can, then biodiversity may be seen to have an intrinsic value, and the existence of such a value seems to be deeply rooted in many societies, cultures and faiths (Gaston and Spicer (2004). Logically, this leads to an absolute moral responsibility to protect other species, the only known living companions of humanity in the universe (Ehrlich and Wilson, 1991; Gaston and Spicer, 2004; Minteer and Miller, 2011).

Without moral consideration of the needs of other creatures, policies for protecting biodiversity will be built on shaky ground (Glenn et al, 2010; Maynard et al, 2014; Minteer and Miller, 2011; Noss and Cooperrider, 1994). Thus, there is need for a reaffirmation of the World Charter for Nature, adopted by the UN General Assembly in 1982, which stated that, "every form of life is unique, warranting respect regardless of its worth to man, and, to accord other organisms such recognition, man must be guided by a moral code of action" (Noss and Cooperrider, 1994: 23).

This section has examined the various categories and sub-categories of biodiversity value. Such categories are, however, not always clear. For example, one can argue that the only true non-use values of biodiversity are existence and intrinsic values, with option and bequest values easily fitting among indirect use values. However, the above categories are still helpful as long as one is mindful of their limitations. Their significance mainly lies in the fact that they broaden the horizon on the value of biodiversity which helps in diminishing the narrow, humanistic and often deleterious judgements on the value of biodiversity. This obviously works in favour of the whole multifaceted spectrum of biodiversity.

3.5 Biodiversity and protected areas

Preceding sections have proven that there is an impending biodiversity crisis. It has also been shown that biodiversity is immensely important for various reasons and hence should be conserved and used wisely. This section looks at biodiversity conservation and protected areas. Specifically, it shall touch on the origins of conservation, the definition and classification of protected areas, and protected area governance approaches.

The mainstream response to biodiversity loss promoted by various conservation organisations and supported by many governments worldwide has been the setting up of protected areas where human use and presence is minimised or completely eliminated (Craigie et al, 2010; Ferraro et al, 2011; Laurance et al, 2014; Lele et al, 2010; Massey et al, 2014; Sloan et al, 2014). However, the idea of protected areas is older than many people believe and has evolved over centuries in a variety of different forms and in many different parts of the world (Gurney et al, 2014; Hambler, 2004). Today, there are over 100 000 protected areas covering approximately 13% of the earth's land area (Chape et al, 2005; Galli et al, 2014; Laurance et al, 2014). The effectiveness of protected areas in conservation has been mixed. While some studies suggest protected areas have significantly reduced deforestation, prevented species

extinction, and conserved land and water resources, these trends have continued in others (Brooks et al, 2009; Curran et al, 2004; Galli et al, 2014; Laurance et al, 2014).

3.5.1 The history of protected areas

Traditionally, histories of protected areas begin with Yellowstone, the first national park in the USA established in 1872 (Brockington et al, 2008). According to this history, the origins of national parks are popularly traced to an early vision of the painter George Catlin who travelled through the American West in the 1830s, visiting over 50 tribes, and inspiring the first use of the term 'national park' (Brockington et al, 2008; Colchester, 2004). Catlin advocated for government protection of a large piece of pristine land where the native Indian could stay together with large herds of wild animals in harmony (Brockington et al, 2008; Colchester, 2004; Spence, 1999). Catlin's plan was put into action by later visionaries who set aside tracts of land for nature protection starting with Yellowstone National Park (Brockington et al, 2008). This approach has subsequently been applied by an increasing number of nations across the world, tempting Nash (2001) to describe it as the USA's greatest idea.

Brockington et al (2008) note that accounts of protected areas must pay careful attention to Yellowstone because this is the place and date when the protected area movement imagines itself to begin, and also because the influence of this movement's 'Yellowstone model' for protecting nature has had such a profound influence all over the world. For example, the World Database of Protected Areas (WDPA) takes Yellowstone as its starting point (Brockington et al, 2008). According to Brockington et al (2008), this story is problematic for at least three reasons. First, the people that Catlin imagined would be part of the landscape were systematically evicted from the newly created national parks, with their removal being ignored and forgotten until only recently (Brockington et al, 2008; Spence, 1999).

Second, while Yellowstone may be the start of the US national parks, the history of protected areas simply does not begin there (Brockington et al, 2008; Colchester, 2004). Philosophies and activities that are recognised as conservation can be found in early writings in many parts of the world (Hambler, 2004). For example, about 2 550 years ago, the prophet Jeremiah noted '…the whole land is made desolate because no man layeth it to heart' (Hambler, 2004: 11). Some 2 450 years ago, Artaxerxes I controlled the felling of Lebanese cedar (Hambler, 2004). Again, some 2 000 years ago, Pliny the Elder was concerned that the Romans were

desertifying the Mediterranean area through deforestation, while Varro noted that overgrazing by goats was destroying vegetation (Hambler, 2004). Mongolia established a national park far much earlier than Yellowstone in 1778 by setting aside Bogd Khan Mountain, with evidence of far much earlier protection dating back to 1294 (Brockington et al, 2008; Milner-Gulland, 2004). Indian princes established personal game reserves mainly for shooting competitions and replenished diminishing stocks by, for example, importing lions from Africa (Verschuuren et al, 2007). Much earlier evidence from India indicates that elephants were protected after their domestication in the 4th and 3rd centuries BC (Rangarajan, 2001), while Emperor Ashoka (268-233 BC) is now celebrated for his environmental edicts (Brockington et al, 2008).

In England, the invading King William I declared in the 11th century, amid resentment from his new subjects, some hunting reserves over 30% of his new domain for the purpose of hunting royal game, with cultivation restricted (Brockington et al, 2008). The King of Srivijaya established Indonesia's first nature reserve in 684 AD (Mishra, 1994), while the Qin Dynasty in China set up imperial hunting reserves in mountainous areas in the 3rd century BC (Xu and Melick, 2007). The ancient empires of Babylon, Assyria and Persia also set up hunting reserves (Brockington et al, 2008).

Third, and finally, Brockington et al (2008) argue that the official history of protected areas is only a record of what large and powerful societies and states have done, and only a memory of those that have left written records. Examples abound of many smaller scale societies conserving places or resources in order to ensure their food supplies (Berkes, 1999). For example, the Huna Tinglit in Alaska regulated the harvest of seabird eggs in accordance with clutch size (Hunn et al, 2003), while indigenous fishing communities in the western USA and sub-arctic practised controlled fishing (Berkes, 1999). In many African societies sacred groves, often used for burials, had high biodiversity, comparing favourably with protected forests (Sheridan and Nyamweru, 2008).

Clearly therefore, histories of protected areas beginning at Yellowstone are flawed (Brockington et al, 2008). In spite of this, Yellowstone has become a powerful conservation model with a huge influence on mainstream conservation as evidenced by the establishment of national parks in many countries throughout the world based on this model (Galli et al, 2014; Laurance et al, 2014; Sloan et al, 2014). While Yellowstone has become a powerful model, it is also a disputed one by many conservationists even within the mainstream, with its

main weakness being that of trying to equate protected areas with national parks (Brockington et al, 2008; Galli et al, 2014). Mainstream conservationists reacted to this as early as the mid-1970s by recognising that there is a wide diversity of protected area models other than Yellowstone (Brockington et al, 2008; Dudley et al, 2010b; Laurance et al, 2014; Scherl et al, 2004). For example, when the World Parks Congress set for itself the goal of setting aside 10% of the land surface of the planet in 1992, it included all categories of protection in that goal and not just national parks (Brockington et al, 2008). Another weakness of the Yellowstone model has been its overemphasis on strict protection of protected areas as opposed to Catlin's original vision of sustainable utilisation. Protected area categories and their governance approaches are discussed in the ensuing sections.

3.5.2 Definition and classification of protected areas

The IUCN defines a protected area as a clearly defined geographical area managed to achieve the long-term conservation of nature with associated ecosystem services and cultural values (Dudley, 2008). The main aim of protected areas is long-term nature conservation, in addition to associated ecosystem services and cultural values (Stolton, 2010b).

Scherl et al (2004) note that there are many types of protected areas in different countries, established for different purposes under different management models, and called by many different names. With the aim of providing some structure, the IUCN has established six categories for protected areas based on their management objectives (Dudley, 2008; Dudley et al, 2010b; Laurance et al, 2014; Scherl et al, 2004). Under this system, some protected areas are strictly protected against consumptive human activities (for example, those in Categories I and II), while others allow for sustainable resource utilisation (for example Categories V and VI) (Laurance et al, 2014; Scherl et al, 2004). Approximately two-thirds of all the protected areas of the world have been assigned an IUCN management category while the remainder (33.4%) is still uncategorised (Chape et al, 2003; Laurance et al, 2014). The IUCN categories are described below (Dudley, 2008):

Category Ia (strict nature reserve): Set aside to protect biodiversity and also possibly geological/ geomorphological features where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values.

Category Ib (wilderness area): Usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, protected and managed to preserve their natural condition.

Category II (national park): Protect large-scale ecological processes, along with the compliment of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.

Category III (natural monument or feature): Protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature, such as an ancient grove.

Category IV (habitat/ species management area): Protect particular species or habitats, where management reflects this priority. Many will need regular active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

Category V (protected landscape): Where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated values.

Category VI (protected areas with sustainable use of natural resources): Conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen.

Like all artificial definitions, the above categories of protected areas are imprecise, with the distinction between them sometimes blurred (Stolton, 2010b). There are some continuing debates on some fundamental questions, and the first question has been about the very definition of a protected area (Dudley et al, 2010b). The debate is centred on whether protected areas should be confined to a narrow focus on biodiversity conservation, or whether they can accommodate a wider set of non-industrial interests incorporating landscape values, local community needs and spiritual and cultural aspects (Dudley et al, 2010b). On the one

hand, there are fears that protected areas will be diluted and their conservation values lost while, on the other, the dominant fear is that emphasis on conservation will undermine other legitimate interests (Dudley et al, 2010b). This has, however, been resolved by recognising that many protected areas will have other values of equal importance besides conservation, though in the event of conflict of interests, nature conservation should take precedence (Dudley, 2008; Dudley et al, 2010b).

Another major debate was on whether Categories V (protected landscape/ seascape) and Category VI (protected areas with sustainable use of natural resources) are really protected areas at all and, if so, how they should be managed (Dudley et al, 2010b). Locke and Dearden (2005) proposed that management in many areas under these two categories paid so little attention to conservation and thus they should be removed from the WDPA. It is important to note that half of the area under protected areas in Europe is in Category V (Dudley et al, 2010b).

Controversy has also come from the use of management objectives in the classification of protected areas by IUCN (Boitani et al, 2008; Dudley et al, 2010b). Boitani et al (2008) have suggested a proposal to change the IUCN system in three ways: (1) have the category designation tied to defined outcomes for the biodiversity elements for which the protected area is recognised or was designed for (for example, a Category I protected area would be essential for the long-term viability of a targeted species, community or ecological system and would protect source populations and ecosystem occurrences); (2) link categories to quantified goals for the biodiversity elements for which the protected area was designed (for example, Category I would require meeting requirements of strict size and naturalness to maintain populations or ecosystem processes while Category VI would make partial contributions to the maintenance of selected biodiversity); and (3) link protected area categories to the context of conservation planning frameworks and to the monitoring and evaluation of protected area management effectiveness. Boitani et al (2008) further note that the current typology based on management objectives was fundamentally flawed and thus should be abandoned in favour of one more closely linked to conservation outcomes. The World Committee on Protected Areas and the IUCN Species Survival Commission have since set up a joint programme to look at options for categorising protected areas based on conservation outcomes (Dudley et al, 2010b).

While the IUCN categories of protected areas have been criticised on various points, they currently provide the best succinct overview of the multiplicity of protected area types (Stolton, 2010b). It is encouraging to note that efforts for their improvement and refinement are already underway as has been shown above.

3.5.3 Protected area governance/ management approaches

The protected area categories discussed above fall within different governance or management types or approaches. At present, many protected areas are owned and managed by national governments (national parks) (Stolton, 2010b). However, a number of other different management approaches or governance types are recognised by IUCN, covering a variety of private and community ownership patterns (Dudley, 2008; Stolton, 2010b). Table 3.3 summarises the different protected area governance types.

Table 3.3: Different governance types in protected areas

Government-managed protected areas	- Federal or national ministry or agency in charge - Local/municipal ministry or agency in charge - Government-delegated management (for example, to a non-governmental organisation - NGO)
Co-managed protected areas	- Trans-boundary management - Collaborative management (various forms of pluralist influence) - Joint management (pluralist management board)
Indigenous and community-conserved areas	- Declared and run by indigenous peoples - Declared and run by local communities
Private protected areas	- Declared and run by individual landowner - Declared and run by non-profit organisation (for example, NGO, university or cooperative) - Declared and run by for-profit organisation (for example, individual or corporate landowners)

Source: Stolton (2010b: 7)

Borgerhoff Mulder and Coppolillo (2005) have also developed a very useful typology of conservation strategies or approaches comprising two axes differentiating various conservation projects (Figure 3.2). First, there are projects which differentiate between use

and preservation, and second those which distinguish between centralised state control and devolved local control (Borgerhoff Mulder and Coppolillo, 2005; Brockington et al, 2008). They then map many conservation strategies or approaches on this matrix as shown in Figure 3.2 below.

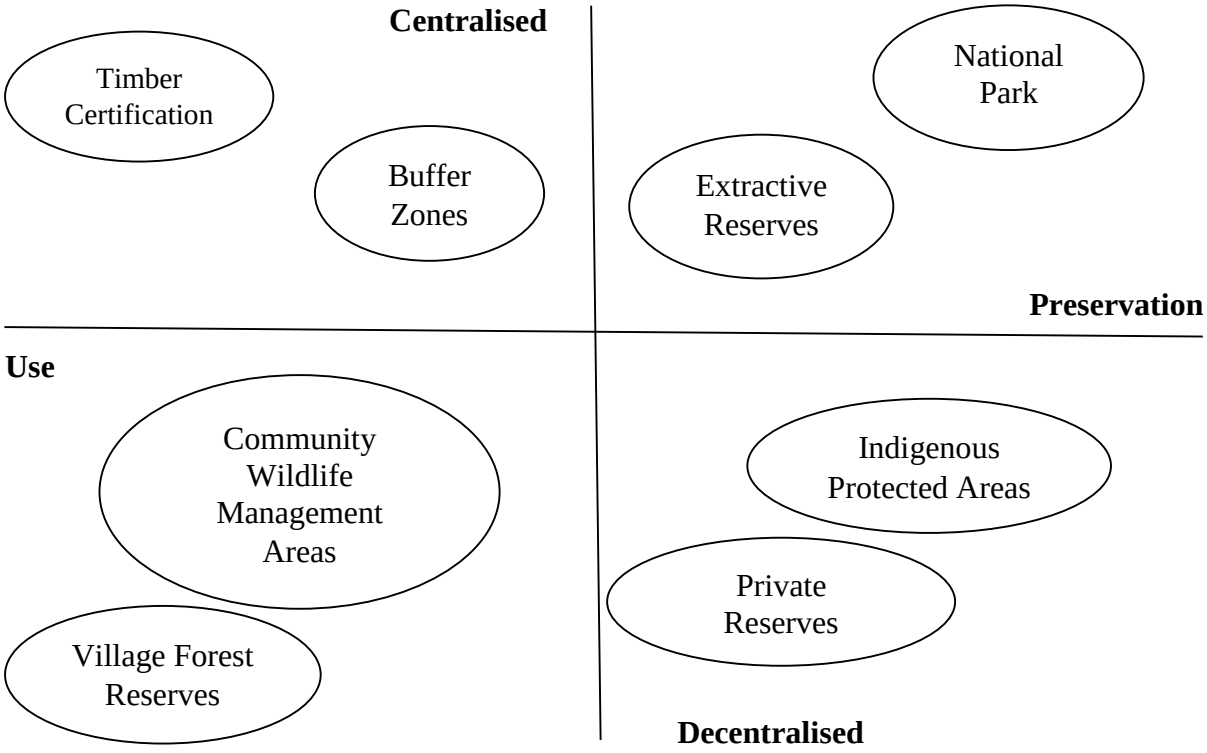

Figure 3.2: A typology of conservation practice
Source: Borgerhoff Mulder and Coppolillo (2005: 300)

Salafsky et al (2002) have also developed yet another taxonomy which attempts to map the wide diversity of conservation activity, strategy and intervention. They divide conservation activities into protection and management, law and policy, education and awareness, and incentives. This complex category system, a modified version of which is outlined in Table 3.4 by Brockington et al (2008), shows that the incentives will influence the relationships between people and nature and also those among people. Moreover, in the laws, policies, educational ideas and mechanisms of protection, there will be countless interactions with the economy and markets (Brockington et al, 2008). Table 3.4 categorises the types of tools available to conservation practitioners. Columns contain broad categories of tools, while each cell contains a broad approach and two examples of more specific strategies (italic font) under this approach.

Table 3.4: A taxonomy of biodiversity conservation approaches and strategies

Protection and Management	**Law and Policy**	**Education and Awareness**	**Changing Incentives**
Strictly Protected Areas: *Reserves and private parks*	Legislation and Treaties: *developing international treaties and lobbying governments*	Formal Education: *developing school curricula and teaching graduate students*	Conservation Enterprises: *linked (for example, ecotourism) and unlinked (for example, jobs for poachers)*
Managed Landscapes: *conservation easements and community-based management*	Compliance and Watchdog: *developing legal standards and monitoring compliance with standards*	Non-Formal Education: *media training for scientists and public outreach via museums*	Using Market Pressure: *certification (positive incentives) and boycotts (negative incentives)*
Protected and Managed Species: *bans on killing specific species and management of habitat for species*	Litigation: *criminal prosecution and civil suits*	Informal Education: *media campaigns and community awareness raising*	Economic Alternatives: *sustainable agriculture/ aquaculture and promoting alternative products*
Species and Habitat Restoration: *reintroducing predators and recreating wetlands*	Policy Development and Reform: *research on policy options and devolution of control*	Moral Confrontation: *civil disobedience and moneywrenching/ ecotourism*	Conservation Payments: *quid-pro-quo performance payments and debt-for-nature swaps*
Ex-Situ Protection: *captive breeding and gene banking*			Non-Monetary Values: *spiritual/cultural/ existence values and links to human health*

Source: Brockington et al (2008: 11)

Conservation has been described as "an incredibly broad church…riven with conflict" (Brockington et al, 2008: 6). Indeed, such a 'broad church' image has been reflected in the many and diverse protected area categories and governance types discussed above. This is because there are sharp disagreements about ethics, morals, practices and compromises

among conservationists (Barbault, 2011; Brockington et al, 2008; Doak et al, 2014; Minteer and Miller, 2011). For example, there are conservationists who prefer wild places without human interference, while others prefer peopled landscapes (Brockington et al, 2008; Minteer and Miller, 2011). There are also some for whom landscape is irrelevant and only species matter, while on the other hand there are conservationists whose concern is strictly their love of particular places and for whom global considerations are irrelevant (Brockington et al, 2008).

There are also some particularly deep divisions among conservationists about some specific issues, for example the debate about trade in live animals or their products (Brockington et al, 2008). A particular case to illustrate this is that of parrot trade. The World Parrot Trust, alongside some conservationists, insist that the trade in these wild birds is resulting in many deaths leading to species loss (Brockington et al, 2008). On the other hand are those who feel that this can be used to raise funds for conservation, and banning will worsen the situation by driving illegal traders underground (Brockington et al, 2008; Cooney and Jepson, 2006; Roe, 2006). Another contentious issue surrounds the trade in ivory. An increasing elephant population in Southern Africa has resulted in overcrowding leading to calls for the legalisation of ivory trade (Brockington et al, 2008). Certainly, under these situations, a multiplicity of conservation approach typologies is not only inevitable, but also justified and helpful (Brockington et al, 2008).

As shown earlier, during the late 19th century and much of the 20th century, the dominant conservation strategy in the world was the establishment of protected areas through state action in the form of national parks (Carter et al, 2008; Kreuter et al. 2010; Massey et al, 2014; Romero et al, 2012; Sloan et al, 2014). Indeed, national parks and other government-protected areas have long served as the conventional tool for biodiversity conservation since the establishment of Yellowstone National Park in the USA in 1872 (Langholz, 2009). Since then, governments worldwide have set aside more than 108 000 protected areas covering 30 million km^2 of land, with many countries having reached the international standard of formally protecting 10% of their territorial surface area (Langholz, 2009).

It, however, became apparent in the second half of the 20th century that national parks were not adequate as a tool for effectively protecting the world's flora and fauna from extinction (Kreuter et al, 2010; Langholz, 2003; Langholz, 2009; Nelson, 2010; Romero et al, 2012). A diverse array of factors increasingly challenges the prevailing state-centric natural resource

policies and management practices across much of the world (Nelson, 2010). The struggle for solutions has led to new approaches, with most of this new conservation effort being directed on communal and private land outside the formally protected national parks (Bond, 2004; Langholz, 2003; Romero et al, 2012).

A general trend in protected area governance approach, since the second half of the 20th century, has thus been a shift towards decentralisation and sustainable use. Such an approach has most probably been hatched out of the sustainable development thinking that emerged roughly around the same time period. The focus of this study is on community-conserved areas and private protected areas, and these are discussed in greater detail as stand-alone sections below.

3.6 Community-based natural resource management (CBNRM)

The involvement of local people in conservation has become a major feature of conservation policy across the world (Adams and Hulme, 2001; Balint, 2006; Cronkleton et al, 2012; Rawlins and Westby, 2013). Disappointment with existing state-led conservation strategies to protect wildlife prompted many analysts, starting in the 1980s, to advocate for a greater involvement of communities and local populations in protection strategies (Agrawal and Redford, 2006; Horwich and Lyon, 2007). It is increasingly being noted that a great deal of hope can be placed in the ability of rural communities to conserve nature, and conservation by local communities is often claimed to be a more equitable and/ or effective alternative to many types of protected areas particularly fortress conservation (Brockington et al, 2008; Liu et al, 2010). Local residents have evolved with their surrounding environment over several centuries and retained traditional ecological knowledge and activities facilitating biodiversity conservation (Liu et al, 2010). Such traditional ecological knowledge, especially as it relates to resource use, can complement modern conservation systems and aid biological research, while supporting a more equitable and culturally sensitive method of management (Cox et al, 2014; Liu et al, 2010). Community conservation areas are also widely perceived to be a means of expanding the conservation estate, ensuring land is managed for conservation purposes beyond the boundaries of formal protected areas (Brockington et al, 2008; Cox et al, 2014; Rawlins and Westby, 2013). Advocates of community-based conservation further insist that it will result in increased support for conservation values and more prosperous and/ or empowered people (Brockington et al, 2008; Rawlins and Westby, 2013). This section

explores the concept of community-based conservation or community-based natural resource management.

3.6.1 The origin and growth of community-based conservation

The predecessors of community-based conservation include the concept of buffer zones introduced by the UN Educational, Scientific and Cultural Organisation's (UNESCO) Man and the Biosphere programme in 1979 and ICDPs popularised in the late 1980s and early 1990s (Bauch et al, 2014; Blom et al, 2010; Campbell and Vainio-Mattila, 2003; Fisher et al, 2005; García-Amado et al, 2013; Niedziałkowski et al, 2014; Pfund, 2010; Scherl et al, 2004). Since the 1980s, conservation organisations have been implementing approaches that aim to build support among local communities by sharing social and economic benefits from protected areas (Bauch et al, 2014; Horwich and Lyon, 2007; Scherl et al, 2004). Such initiatives involved compensating local people for lack of access to protected areas and providing alternative income sources that would allow people to benefit economically from conservation while refraining from environmentally destructive practices (Cox et al, 2014; Fisher et al, 2005; Scherl et al, 2004). A lot of international development agencies provided funding in support of biodiversity conservation through ICDPs in the 1990s (Scherl et al, 2004). However, buffer zones and ICDPs have been criticised for their failure to adequately involve local populations in planning and decision-making (Agrawal and Redford, 2006; Bauch et al, 2014; Campbell and Vainio-Mattila, 2003; García-Amado et al, 2013; Horwich and Lyon, 2007; Wells and Brandon, 1993). Many ICDPs have failed to produce 'win-win' conservation and development outcomes (Blom et al, 2010; Larson et al, 1997; Pfund, 2010; Wells and Brandon, 1993), as evidenced by a general failure to limit unsustainable resource use and a lack of demonstrable improvements in peoples' livelihoods (Agrawal and Redford, 2006; Bauch et al, 2014; Scherl et al, 2004). Some of the major shortcomings of the first generation ICDPs have been summarised by McShane and Wells (2004 cited in Scherl et al, 2004: 30):

- The flawed assumption that planning and money alone were sufficient to achieve 'win-win' scenarios;
- Attempting to implement ICDPs within the framework of a time-bound 'project cycle' and failure to adapt to the pace of local communities by trying to meet externally imposed deadlines;

- Failure to identify, negotiate and implement trade-offs between the interests and claims of multiple stakeholders;
- Lack of adaptive management and flexibility to respond to evolving scenarios;
- Failure to cede significant decision-making to local stakeholders so that ICDPs remained outside local systems, thereby reducing the likelihood that any gains they may have achieved would persist beyond the project life;
- Perceived or actual bias towards the interests of either the protected area management agency or an environmental NGO;
- A focus on activities (social programmes and income creation through alternative livelihoods) rather than impacts (on biodiversity);
- Addressing local symptoms while ignoring underlying policy constraints or conversely dealing with macro-level issues while ignoring local realities; and
- Regarding 'local communities' as a homogenous entity when the reality was a wide range of different stakeholders with different needs and aspirations.

Another attempt to involve local communities in protected areas, besides through buffer zones and first generation ICDPs, has been through inclusive or collaborative management approaches (Ameha et al, 2014; Fischer et al, 2014; Fisher et al, 2005; Ming'atea et al, 2014; Scherl et al, 2004; Cronkleton et al, 2012). Indeed the formation of partnerships for active participation in the day-to-day management of protected areas is becoming more and more widespread (Scherl et al, 2004). Co-management arrangements have come out of the realisation that local communities have roles to play in resource management, conservation and development, and also from the reality that forest-dependent communities have demanded a recognition of their rights and have thus increasingly been difficult to exclude (Cronkleton et al, 2012; Ming'atea et al, 2014). Collaborative management or co-management involves a partnership between stakeholders, especially protected area authorities and local communities (Cronkleton et al, 2012; Fisher et al, 2005; Trimblea et al, 2014). Systems of co-management between local communities and technical advisors such as government protected area authorities, NGOs or private contractors can ensure that local communities have a stake in decision-making and receive a significant share of the benefits from protected areas (Brockington et al, 2008; Scherl et al, 2004; Wells and Brandon, 1992).

However, collaborative management arrangements as a way of involving local communities in conservation, just as with buffer zones and first generation ICDPs, has not been well

received. Brockington et al (2008) have noted that the label 'co-management' is problematic as it implies equality between the participants. In reality, protected area authorities have often been the dominant partners, wielding most of the decision-making powers over conservation and the benefits derived from it, at the expense of their powerless and long-marginalised local-community partners lacking the capacity and experience to flourish in such institutional environments (Brockington et al, 2008; Cronkleton et al, 2012; Lopes et al, 2013; Scherl et al, 2004; Zhu et al, 2014). The sharing of decision-making under collaborative management arrangements often does not eliminate the power imbalances inherent in top-down management approaches (Chen et al, 2014; Cronkleton et al, 2012). Collaborative management also conceals a considerable diversity of practices, and a variety of specific historical and political circumstances that would have given rise to the arrangements (Brockington et al, 2008; Rodwell et al, 2014).

Community conservation has been hailed as a more realistic move for ensuring that local communities are more directly involved in decision-making and benefit sharing from conservation. Compared to the above attempts (buffer zones, first generation ICDPs and collaborative management) to involve local communities in conservation, community-based conservation is different in that it places the community's involvement at the centre of conservation, rather than the mechanisms for achieving it such as parks, projects or land use zoning (Campbell and Vainio-Mattila, 2003; Cox et al, 2014; Rawlins and Westby, 2013). Community conservation projects see local rural people as the solution to habitat degradation, whereas ICDPs see them as the problem (Horwich and Lyon, 2007). According to Western and Wright (1994: 9), the central tenet of community-based conservation is "the co-existence of people and nature, as distinct from protectionism and the segregation of people and nature". Adams and Hulme (2001: 13) have defined community-based conservation as "those principles and practices that argue that conservation goals should be pursued by strategies that emphasise the role of local residents in decision-making about natural resources".

Community-based conservation represents a more inclusive and people-oriented approach to conservation and is a reaction to the failure of exclusionary conservation in a world in which social and economic factors are increasingly seen as key to conservation success (Berkes, 2004). The counter-narrative of community-based natural resource management, especially through community conservation areas, effectively displaced the narrative of 'fortress conservation' by emphasising development through community conservation and sustainable

use (Balint, 2006; Berkes, 2004; Horwich and Lyon, 2007; Murphree, 2002). While, as shown earlier, buffer zones, first generation ICDPs and collaborative management are viewed as early attempts at community-based conservation, the level of locals' involvement in decision-making under such arrangements was too low compared to community conservation areas largely owned, managed and controlled by local communities. For this reason, community-based conservation initiatives through community conservation areas have often been referred to as a new generation of ICDPs, more truly representative of the community conservation counter-narrative.

The community-based conservation counter-narrative was quickly accepted within conservation circles, and several factors acted as catalysts towards this more people-centred conservation approach (Adams and Hulme, 2001; Cranford and Mourato, 2011; Fabricius, 2004; Gustavssona et al, 2014). First, community conservation equates conservation with sustainable development and hence captures the huge upwelling of policy commitment from the UNCED in 1992 which argued that conservation goals should contribute to, and not conflict with, basic human needs (Adams and Hulme, 2001; Cranford and Mourato, 2011). This argument led some commentators, in turn, to argue that fortress conservation must be abandoned because of its adverse impacts on the living conditions of the rural poor (Adams and Hulme, 2001; Reed, 2008; Reed et al, 2009). Community conservation therefore provides a conceptual framework within which the conservation of biodiversity and the challenge of meeting human needs must be integrated (Cottrell et al, 2013; Holden et al, 2014).

A second reason for the success of the community conservation narrative was that it developed at a time of significant shifts in the dominant discourses of development (Adams and Hulme, 2001; Romero et al, 2012). During the 1970s 'top-down' technocratic or blueprint approaches to development came under increasing scrutiny as they failed to deliver the economic growth and social benefits that had been promised (Adams and Hulme, 2001; Romero et al, 2012; Turner and Hulme, 1997). A new perspective emerged arguing that "development goals could only be achieved by bottom-up planning, decentralisation, process approaches, participation, and community organisation" (Adams and Hulme 2001: 17). The impact of such alternative development thinking was witnessed through commitments by aid donors and development planners towards adapting participatory development approaches in the early 1990s (Adams and Hulme, 2001). The link that had earlier been forged between conservation and development gave conservationists strong motivation to do the same,

especially as this enabled them to tap into new sources of funds by making their activities fit development aid budgets (Adams and Hulme, 2001).

A third reason that catalysed the success of the community conservation paradigm lies in the renewed interest in the 1980s in the market as a means of delivering development (Adams and Hulme, 2001; Romero et al, 2012; Toye, 1993). This renewed market-oriented development thinking argued that, to achieve public policy goals (including conservation, development or sustainable development), economic incentives must be set correctly for all of the main actors through market mechanisms (Adams and Hulme, 2001). This therefore required non-market actors such as state agencies, which distorted markets and thus made public policy goals unachievable, to be abolished (Adams and Hulme, 2001). The implication of this to conservation goals was less regulation and more entrepreneurial action by local communities, individual businessmen and private companies thereby unlocking the economic values of conservation resources and making them part of the local and global economy (Adams and Hulme, 2001; Cranford and Mourato, 2011; Gustavssona et al, 2014).

Adams and Hulme (2001) further note that community conservation also fitted well into the 'New Policy Agenda' for foreign assistance that had developed in Washington in the early 1990s, driven by benefits of neo-classical economics and liberal democratic theory. Community conservation seemed to be in tandem with neo-classical economics as it recognised the importance of economic incentives and markets; meant a reduced role for the state; and created spaces for communities, including villages, private individuals, companies and groups of companies, to be more involved in conservation (Adams and Hulme, 2001; Cranford and Mourato, 2011). Community conservation was also in line with liberal democratic theory as, by helping communities to organise themselves to manage natural resources, it deepened the democratisation process (Adams and Hulme, 2001).

Another reason for the success of community conservation came out of the realisation that conservation goals can often not be achieved within the boundaries of formal protected areas, even if they were quite large (Adams and Hulme, 2001). It has increasingly been realised within conservation biology that mobile wildlife species cannot be sustained on small preservation islands such as national parks and buffer zones but needed large dispersal areas to ensure healthy breeding stock and to respond to local extinctions and environmental changes (Adams and Hulme, 2001; Goswami et al, 2014). This led to the realisation that conservation needed to reach out of protected areas into the wider landscape, with

communities in these landscapes being recognised as key stakeholders and partners for the success of the conservation cause (Cox et al, 2014; Cronkleton et al, 2012; Goswami et al, 2014). The 5th IUCN World Parks Congress recognised that "a considerable part of the earth's biodiversity survives on territory under the ownership, control or management of indigenous peoples and local communities" (Scherl et al, 2004: 35). Most such sites have been hitherto unrecognised in formal national and international conservation systems but participants at the Congress changed this by recommending national and international support for community conservation areas (Scherl et al, 2004).

Community-based conservation has also been influenced by the human rights and indigenous peoples' movements of the 1970s and 1980s which viewed human rights, social justice and livelihoods, rather than nature, as the top priority (Dyer et al, 2014; Fisher et al, 2005; Romero et al, 2012). Such movements were characterised by a resistance by local communities to government appropriation and control of vast territories without due consideration of local knowledge and traditional institutional arrangements for natural resource use, and set the stage for a new era of conservation that would more thoroughly integrate human benefits and biodiversity conservation (Romero et al, 2012). This saw a number of communities during the early to mid-1990s (especially in southern Africa) organising to claim back title to land in protected areas from which they were removed during colonial and apartheid times (Fabricius, 2004; Southern African Sustainable Use Specialist Group, 1997).

The community conservation narrative has diffused fast across the world, especially in Africa (Adams and Hulme, 2001; Blaikie, 2006). The more solid entrenchment of community conservation in sub-Saharan Africa has been due to the high level of aid dependence, the influence of multilateral and bilateral development agencies over domestic policies, and the relative weakness of the state in Africa (Adams and Hulme, 2001).

A wide variety of community-based conservation and resource management systems exist throughout the world and it is therefore difficult to assess them or classify them, partly due to inconsistent terminology (Adams and Hulme, 2001; Dyer et al, 2014; Fisher et al, 2005; Scherl et al, 2004). The concept thus loosely encompasses a plethora of associated terms such as community-based conservation, community-based natural resource management, community wildlife management, community-based forestry and ICDPs - and these are used in different and often contradictory ways (Adams and Hulme, 2001; Dyer et al, 2014;

Fabricius, 2004; Fisher et al, 2005). Fisher et al (2005) have identified at least three ways of classifying community-based conservation arrangements. First, these can be defined by whether the initiative for establishing the community-based conservation management system arose from local people or from outsiders. In many cases, however, community-based conservation arrangements are often initiated through a combination of local and external initiatives (Fisher et al, 2005). Second, community-based conservation arrangements can be classified in terms of tenure and the related power to make decisions about resources, and these have been identified as important factors in the success of Community Based Natural Resource Management (CBNRM). Finally, community-based conservation arrangements can be classified in terms of the nature of the relationship between the community institution and government agencies and other external actors, and this can range from total independence through some sort of joint management or power sharing through to dominance by an outside agency. CBNRM initiatives are often successful where the community institution enjoys high levels of independence (Ameha et al, 2014; Cox et al, 2013; Fisher et al, 2005).

3.6.2 Key tenets of community-based conservation

This sub-section considers some concepts and ideas that are essential to community conservation and local management of natural resources.

3.6.2.1 Community

The concept of community is obviously significant, since all community-based interventions must have a target that is called a community, which is the unit of ownership (Brockington et al, 2008; Fabricius, 2004). The International Institute for Environment and Development (IIED) (1994) points out that the concept of community can be approached in spatial, socio-cultural and economic terms. Spatially, communities can be viewed as groupings of people who physically live in the same place; socio-culturally, they can be considered as social groupings, who derive unity from a common history and cultural heritage, frequently based on kinships; while economically, they can be considered as groupings of people who share interests and control over particular resources (Barrow and Murphree, 2001; IIED, 1994). Similarly, community conservation interventions often revolve around collective agreement and decision-making as necessary steps in doing conservation (Brockington et al, 2008). Community conservation draws from the assumptions that rural communities are harmonious and homogenous, and are thus viewed as ideal stewards of their natural resources (Barrow and Murphree, 2001; Brockington et al, 2008).

However, the above-portrayed model of the concept of community is problematic as it is static, giving little hint of the changing membership and composition of rural societies due to forced relocation, migration, rural/ urban labour and resource flows, and changing agricultural practices (Barrow and Murphree, 2001; Brockington et al, 2008; Cox, 2014; Fabricius, 2004). Community boundaries may change as development shifts land from one jurisdiction to another, and as governments impose new units of local governance on rural areas (Barrow and Murphree, 2001). In addition, the spatial dimension of community may not always match socio-cultural or economic boundaries (Barrow and Murphree, 2001). The long-held view of harmonious and homogenous local communities has also since been questioned. This is because rural communities have been found to be highly heterogeneous as demonstrated through conflicts within the communities along the lines of ethnicity, kinship, length of residence, livelihood practices, educational status, age, gender, social class, affinities to political parties and NGOs, and the often perennial disputes between traditionalists and modernists (Barrow and Murphree, 2001; Brockington et al, 2008; Cox, 2014; Fabricius, 2004; Gustavsson et al, 2014; Koch, 2004). An example of conflict in CBNRM is provided by Koch (2004) whereby traditional authorities were hindering the success of the Luangwa Integrated Rural Development Project by interfering with participatory democracy and the sharing of benefits. In another example, an integrated conservation and development programme in some villages adjoining the Madikwe Game Reserve in South Africa was bedevilled for many years by a conflict that took the form of a battle between women and men for the control of the development committee (Koch, 2004). As a result, the concept of community is a vague and elusive one which continues to defy precise definition (Barrow and Murphree, 2001; Muboko, 2011).

In response to the challenge and futility involved in attempting to provide a single and all-sufficient definition of the term community, Barrow and Murphree (2001) have adopted a functional approach to the topic, identifying four requirements to enable rural resource users to organise themselves for collective action for effective natural resource management, in spite of their differences, namely (Barrow and Murphree, 2001: 26-27):

- *Cohesion:* This refers to a sense of common identity and interest which serves to bring people together for collective action, and leads them to collectively differentiate themselves from others. Its sources commonly arise from a shared history and culture, although it may be a product of political and economic factors which force people to

share a finite resource base. Whatever its history, cohesion is the social glue which persuades people, in spite of their differences, to act collectively to enhance mutual interest.

- *Demarcation:* While cohesion sets social boundaries and determines membership, a parallel requirement is demarcation, which sets the boundaries of jurisdiction for the collective regime. This demarcation is commonly based on spatial criteria through the delineation of a fixed land area and the resources on it. It may, however, be drawn on the basis of socially sanctioned access to given resource categories, as in the case of pastoralism or some fisheries. Whatever the criteria used, the definition of jurisdiction links and reinforces authority and responsibility for the collective grouping and is necessary for efficient organisational activity.
- *Legitimacy:* Just as collective organisation requires demarcation, it also requires legitimacy for its processes and leadership, which needs to relate to both power and authority. External authority can confer legitimacy but this on its own tends to be a necessary but not sufficient condition. More important is internal legitimacy arising from socio-cultural and socio-economic criteria. In many contexts, these criteria are at odds with those which modern states currently seek to impose on rural populations, especially in Africa, and the persistence and adherence to them often creates tension and conflict. An internal legitimacy endogenously derived but also sanctioned by the state is likely to produce a more robust base for organisation.
- *Resilience:* In the rapidly changing context of the rural areas of the world, mainly due to globalisation, the components of social organisation are dynamic. The roots of social cohesion may change in their substance and combinations, boundaries of jurisdiction and affiliation may shift and the sources of legitimacy may change. Effective organisation must accommodate this change, evolving over time. Resilience, that is the organisational capacity to adapt in content and structure, is a key tool for the management of risk in uncertain environments and livelihoods systems. This characteristic provides durability to organisations and creates scope for them to improve through processes of adaptive management.

Communities displaying the above organisational attributes of cohesion, demarcation, legitimacy and resilience are likely to succeed in their community-based conservation endeavours. Conversely, those communities lacking some or all of these attributes will most

likely struggle or even fail in collaboratively and effectively managing their common property natural resources.

Another important debate in CBNRM is on whether a natural resource management initiative has to be wholly community-owned to qualify as community-based conservation (Agrawal and Gibson, 1999; Brockington et al, 2008; Fabricius, 2004). It is now increasingly realised that most, if not all, community-based conservation initiatives involve a combination of community and privately owned endeavours (Agrawal and Gibson, 1999; Brockington et al, 2008; Leisher et al, 2010). CBNRM is multi-faceted and involves an integration of different types of assets, with private and communal resources being managed side by side (Fabricius, 2004). Noting this, Agrawal and Gibson (1999) have stated that the local and external are linked together such that it might be difficult to demarcate where local conservation begins and the external, helping establish local efforts, ends. Indeed, community-based conservation is increasingly being promoted by global networks of NGOs, international organisations, bilateral and multilateral donors and private companies (Brockington et al, 2008).

3.6.2.2 Devolution

The concept of devolution is closely related to the concept of community, since if communities are going to actually manage natural resources, they will need to have the rights and responsibilities necessary to do so (Brockington et al, 2008). Ribot (2004: 8) has defined devolution as "the transfer of power to elected local authorities". Effective devolved management of natural resources by rural communities is in many ways the Holy Grail of effective community-based conservation (Adhikari et al, 2014; Brockington et al, 2008; Magome and Fabricius, 2004).

In theory, devolution has much to offer and is potentially a useful alternative to the inefficiencies of central state control (Brockington et al, 2008). In addition to enhancing natural resource management, devolution might be a vehicle for promoting stronger democracies (Brockington et al, 2008; Ribot, 2004; Ribot et al, 2006). One of the earliest examples of devolved natural resource management was the Communal Area Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe, which provided a model for conservation and development practice and was used as a template in sub-Saharan Africa and beyond (Brockington et al, 2008; Murombedzi, 2010; Nelson, 2010; Rihoy et al, 2010).

Unfortunately, in spite of all the talk about devolution, there are few, if any, cases where it has really been tried (Brockington et al, 2008; Nelson, 2010; Ribot, 2004; Ribot et al, 2006; Ribot, 2008). Devolution has often been incomplete and has rarely been tried properly (Brockington et al, 2008; Ribot, 2004). Sometimes local powers are captured by local elites, or power can be devolved to local institutions such as customary authorities, none of whom are properly accountable to electorates (Adhikari et al, 2014; Blaikie, 2006; Brockington et al, 2008; Nelson, 2010; Ribot, 2008). The outcome of the above failures towards complete devolution include increased exclusion and disempowerment of some or all local community members from benefiting from natural resources, or the potential facilitation of commercial exploitation by large-scale corporations that receive permission to enter a community from the new gatekeepers (Blaikie, 2006; Brockington et al, 2008; Nelson, 2010). Such outcomes can be detrimental to local livelihoods.

3.6.2.3 Participation

Public participation is becoming increasingly embedded in national and international environmental policy, as decision-makers recognise the need to understand who is affected by the decisions and actions they take, and who has the power to influence their outcome (Reed et al, 2009). The concept of participation underpins the normative theory of community conservation and is part of a fundamental shift in development thinking that is now embraced in conservation approaches (Barrow and Murphree, 2001; Gustavsson et al, 2014; Pfund, 2010). Community-based conservation should be participatory because the user is part of the system; effective participation by members of the group is essential for the legitimacy of initiatives; and local people generally mistrust authorities and want to be involved and informed because of bad historical experiences (Fabricius, 2004; Gustavsson et al, 2014).

Pimbert and Pretty (1994 cited in Burrow and Murphree, 2001: 28) have come up with categories of participation ranging from minimalist approaches merely entailing the receiving of information to empowering approaches that involve the creation of autonomous institutions operated by the community (Table 3.5). In terms of the roles assigned to people, Barrow and Murphree (2001) note that the first two categories (passive and information giving) cannot be considered as falling under the rubric of community conservation as they do not involve local collective action. It is only in the last four categories in the table that

collective activity is required and where the concept of community conservation has relevance (Barrow and Murphree, 2001).

Table 3.5: A typology of participation

Type of participation	Description
Passive	Told what is going to happen or already happened. Top-down, information belongs to external professionals.
Information giving	Answer questions from extractive researchers. People not able to influence analysis or use.
Consultative	Consulted. External agents listen to views. Usually externally defined problems and solutions. People not involved in decision making.
Functional	Form groups to meet predetermined objectives. Usually done after major project decisions have been made. Therefore, initially dependent on outsiders but may become self-dependent and enabling.
Interactive	Joint analysis and actions. Use of local institutions. People have stake in maintaining or changing structure or practices.
Self-mobilisation or Empowerment	Take decisions independent of external institutions. May challenge existing arrangements and structures.

Source: Pimbert and Pretty (1994 cited in Barrow and Murphree, 2001: 28)

Natural resources must contribute to people's well-being and this can best be achieved when local people are involved in management (Fabricius, 2004; Gustavsson et al, 2014; Pfund, 2010). Participation by locals is therefore key to the success of community-based conservation initiatives.

3.6.2.4 Incentives

It is often assumed that the greater the material benefit, the wiser the natural resource base will be managed (Fabricius, 2004), though this has been refuted in some cases (Magome and Fabricius, 2004). Incentives or benefits motivate communities and other role players to not only participate in projects, but also to manage natural resources sustainably (Adhikari et al, 2014; Fabricius, 2004; Reed, 2008; Reed et al, 2009). They also encourage local residents to engage in planning, to participate in the creation of new local institutions and rules, and generally, to engage and sacrifice their time for many years or even decades (Fabricius, 2004; Gustavsson et al, 2014).

It is usually relatively easy to get people interested in a CBNRM initiative at the start because it might be new to them and therefore they will be inquisitive (Fabricius, 2004). Ongoing

interest and participation is a different matter, and therefore the incentives for initial participation must differ from those for ongoing participation (Fabricius, 2004).

The incentives to motivate local people to participate in CBNRM can be tangible (measurable in monetary terms) or intangible and can include the promise of donor funding, the hope of development, an opportunity to apply traditional knowledge and a vision of wildlife conservation among others (Adhikari et al, 2014; Fabricius, 2004). An overemphasis on tangible benefits may, however, create problems. For example, Village Beach Committee members in Malawi refused to serve voluntarily on committees and demanded payment for their participation (Fabricius, 2004).

3.6.3 Conditions facilitating the success of common property management regimes

As shown earlier, local attempts to manage resources and promote conservation outside private land and state-protected areas, such as those involved in community-based conservation, will require the cooperation of groups of resource users (Ameha et al, 2014; Blaikie, 2006; Brockington et al, 2008). The question therefore arises on what conditions make for effective common property management regimes, and under what circumstances they are likely to perform poorly or fail (Ameha et al, 2014; Brockington et al, 2008). There have been widespread research efforts to document diverse cases of common property resource management governing irrigation, fisheries, grazing and forestry (Baland and Platteau, 1996; Bromley and Cernea, 1989; Berkes, 1989; Feeney et al, 1990; Ostrom, 1990; Ostrom and Nagendra, 2006; Wade, 1988). Such research work has found that strong common property management regimes are typically characterised by clear rules of who is allowed to use the resource and when they are allowed to use it, with clear social and spatial boundaries with respect to use (Ameha et al, 2014; Blaikie, 2006; Brockington et al, 2008; Cox et al, 2013). Agrawal (2001; 2003) has compiled and synthesised some of the factors determining the effectiveness of a common property resource management initiative which includes community characteristics, nature of the resource, type of resource use, government support and the political context among other variables (Table 3.6).

Table 3.6: Conditions facilitating common property management regimes

Condition	Characteristics
1. The character of the resource	- small size - well-defined boundaries - low levels of mobility - possibility of storing benefits from the resource - predictability
2. The nature of the user group	- small size - clearly defined boundaries - shared norms - past successful experiences - appropriate leadership - the group is internally interdependent - heterogeneity of endowment; homogeneity of identities and interests
3. Relationship between characteristics of the resource and the group	- overlap between the group's residence and the location of the resource - high levels of dependence on the resource by the group - equitable allocation of benefits from common resources - low levels of user demand - gradual change in levels of demand
4. Institutional arrangements	- rules are simple and easy to understand - access and management rules are locally devised - rules are easily enforced - graduated sanctions - adjudication cheap - monitors and other officials accountable to users
5. Relationship between resources system and institutional arrangements	- match restrictions on harvests to resource Regeneration
6. The wider social and political environment	- exclusion technology is low cost - adaptation time of technology suited to resource's dynamics - low levels of articulation with external markets - gradual change in articulation with external markets - the state: - central government does not undermine local authority - external sanctions supportive - aid supports conservation activities - nested appropriation, provision, enforcement and governance

Source: Agrawal (2001: 1659)

There are, however, some important complications in relation to the above conceptual framework on the effectiveness of common property resource management initiatives (Brockington et al, 2008). This is because it assumes that the strength of a common property management regime is the dependent variable, while the other aspects such as community homogeneity and nature of the resource are the independent variables (Brockington et al, 2008; Ostrom and Nagendra, 2006). This is not always the case as it is possible for the birth and development of common property management regimes to fundamentally affect the nature of the so-called independent variables (Agrawal, 2014; Blaikie, 2006; Ostrom and Nagendra, 2006). For example, research on fisheries in Thailand has shown heterogeneous communities uniting and overlooking their differences in order to exclude outsiders (Brockington et al, 2008). In other words, community homogeneity was a product of the establishment of the regime, not a condition for its success.

However, in spite of the above argument, the variables in Table 3.6 have been proven to be crucial in influencing the outcome of common property management regimes worldwide. In addition, many of these variables have also been found to be causally related.

3.6.4 Some challenges in community-based conservation

Community-based conservation is now widely recognised as an important conservation initiative throughout the world. However, like all other conservation approaches, community-based conservation has its own fair share of challenges and uncertainties (Cox, 2014; Fabricius, 2004; Gustavsson et al, 2014). Some of these challenges have succinctly been summarised by Fabricius (2004: 20-23):

- *Different definitions of participation:* Although the policy trend is towards increased participation and devolution of natural resource management to communities, the interpretation of 'participation' on the ground varies widely. The state will always have a role in natural resource management, and many natural resource professionals feel that the state should control access and decision-making over natural resources, and that communities should be passive participants.
- *Naïve assumptions about custodianship:* The assumption that local people, when given opportunities to participate and benefit from biodiversity, will automatically become custodians of the natural resource base is naïve. The engagement of local people in biodiversity conservation requires a range of critical ingredients that vary

from one context to another. The lack of meaningful devolution of authority, and the lack of land ownership has contributed to apathy in many communities.

- *Elusive communities:* The expectation that local people should 'speak with one voice' and have a single vision that encompasses all the aspirations of the group often does not hold. It is becoming apparent that the term community is difficult to define, at least, because local groupings constantly redefine and realign themselves and reformulate their objectives. Moreover, 'indigenous peoples' refuse to subscribe to the stereotype assigned to them by donors and NGOs of 'pristine hunter-gatherers'. But they also do not fit the development stereotype of 'civilised' Western societies.
- *Overestimated financial benefits:* The benefits from formal project-related nature-based enterprises are generally overestimated. Most of the formal community-based tourism and wildlife management projects produce meagre dividends per household. Non-financial benefits, on the other hand, are more valued and underestimated.
- *Weak institutions:* Local institutions are often weak and unstable, or unacceptably flexible, and traditional institutions are disappearing and are being replaced by open-access systems and lawlessness. Furthermore, the amount of effort and resources required to sufficiently develop local institutions has been grossly underestimated. The extent and duration of facilitation and assistance to local communities that is required has equally been underestimated. Project managers now realise that project cycles should be measured in decades rather than years.
- *Poor local administrative capacity:* Local people's ability to manage and administer revenues from natural resources is primarily weak. Because of decades of poverty and experiences of being marginalised, the temptation to be corrupt is often too great. New elites, for example, often try their best to gain a disproportionate share of the benefits from biodiversity projects. The much-promoted partnerships between communities and the private sector are also not the panacea they were anticipated to be. Joint-venture partnerships often approach community-based enterprises with caution because of the high risks involved, the high potential for corruption and manipulation, and uncertainties about their rights and obligations.
- *Globalisation:* These days local people are as keen as most other citizens to spend their money on modern conveniences such as cell phones and vehicles, and are much more mobile than before. Many rural villages consist of school children and old people, with everyone of working age either looking for a job in the urban areas or

already working there. This has profound implications for capacity development in rural communities.

The above, and other, challenges have adversely affected the success of many community-based conservation initiatives. An important observation on community-based conservation by Brockington et al (2008) is that, just as fortress conservation (or any other conservation arrangements) distributes fortune and misfortune unequally to different groups within society, so also does conservation by communities and indigenous peoples. Community conservation merely introduces a different set of inequities to protected areas, and such inequities are more evident where the above challenges are concentrated and reinforcing each other (Brockington et al, 2008; Cox, 2014). However, despite these challenges, community-based conservation has grown to becoming a key conservation approach across the world and, as shown earlier, is in many respects better than protectionism.

3.7 Private protected areas

There is an increasing acknowledgement of the importance of the private sector to biodiversity conservation strategies (Carter et al, 2008; Iftekhar et al, 2014). However, despite the recent proliferation of private protected areas and their increasingly large role in international biodiversity conservation, there has been little systematic analysis of their characteristics and implications (Carter et al, 2010; Iftekhar et al, 2014; Langholz, 2003; Langholz, 2009). This section shall attempt to bring together information currently available in the domain of private protected areas.

3.7.1 Origin and development of private protected areas

Despite their apparent newness, private protected areas have a long history and rather represent a recent incarnation of an old idea (Holmes, 2013; Langholz, 2003). The establishment of private reserves is not a new development and their precursors can be traced hundreds of years back to royal hunting preserves (Alderman, 1994; Duncan et al, 2014; Holmes, 2013; Langholz, 2003). Langholz (2003) mentions some hunting and riding reserves set aside for Assyrian noblemen as far back as 700 B.C., while open spaces were reserved for the ruling class in Ancient Rome and Medieval Europe. However, although these early reserves were private in the sense that access was limited to a wealthy few, one can argue that owners were not easily distinguishable from the state and thus these reserves represented a form of public ownership (Geisler and Daneker, 2000; Langholz, 2003).

The second half of the 20th century witnessed a marked proliferation in private nature reserves (Carter et al, 2008; Duncan et al, 2014; Kreuter, 2010; Romero et al, 2012). The failure of national parks to adequately protect biodiversity; rising societal interest in biodiversity; and the growth of the global nature-based tourism industry, wildlife-based photo tourism and recreational hunting were some of the key factors behind the boom in private nature reserves (Carter et al, 2008; Langholz, 2003; Nelson, 2010; Romero et al, 2012).

Conservation literature has, however, been slow in acknowledging the expanding role of the privately owned parks (Holmes, 2013; Langholz, 2003). The first and strongest modern reference to privately owned parks was Recommendation 10 from the First World Congress on National Parks which noted that many reserves throughout the world were owned by private individuals and institutions and that it was desirable for the number and diversity of such areas to increase (Langholz, 2003; 2009). Delegates to the 2003 World Parks Congress produced a Private Protected Area Action Plan designed to improve and expand the private protected area model as a biodiversity conservation tool (Langholz, 2009). A year later, parties to the CBD approved a Programme of Work on Protected Areas that included specific requirements relating to private protected areas (Langholz, 2009). The CBD's programme of work on protected areas comments on the importance of recognising and promoting a broad set of protected area governance types including private nature reserves (Carter et al, 2008), while the Global Environment Facility (GEF) has committed to developing a private sector biodiversity conservation strategy (Carter et al, 2008; GEF, 2007). In 2005, the IUCN dedicated an issue of PARKS magazine to private protected areas which created a platform for discussing the rising private reserve niche (Langholz, 2009). Delegates to the 2008 World Conservation Congress called for the establishment of the world's first Private Protected Area Task Force to look into ways of enhancing the role of private protected areas worldwide (Langholz, 2009).

The above and other forums, particularly the World Parks Congress and the CBD, have made various recommendations for advancing private protected areas as a biodiversity conservation approach and some of these recommendations are summarised below (Langholz, 2009: 5-8):

- *Assess the current status and potential role of private protected areas worldwide.* Parties to the CBD are required to assess the status of private protected areas. They can then channel national-level information to the CBD Secretariat, which can then combine it into a global snapshot of current status. Such information will then be used

for assessing future opportunities through conducting a gap analysis showing where non-state lands occur and the extent to which they coincide with critical conservation priorities. The IUCN Private Protected Area Task Force created at the 2008 World Congress would be a natural focal point for these efforts, which include promoting international sharing of private protected area best practices.

- *Strengthen the legal framework for private protected areas*. Implementing this recommendation requires two steps, the first of which would be a global assessment of the current legal landscape. This includes analysing existing legislation across the world that explicitly define and support formal private protected areas. The second step would be to fill existing legal gaps by developing laws, regulations, policies, and programmes that support the creation of formally declared private protected areas in a variety of forms such as conservancies, conservation easements, conservation concessions, and other protection mechanisms. This would include taking steps to strengthen legal security for conservation lands, including the recognition of rightful owners, reform of land tenure laws, and improved law enforcement. Such tenure security provides a necessary and powerful incentive for landowners to invest in long-term resource protection.
- *Broaden the suite of fiscal and other incentives that support private protected areas*. The single best way to stimulate private protected area growth would be to level the playing field by removing adverse incentives that steer land use decisions towards cattle ranching, agriculture, mining, logging, and other extractive activities. This includes removing direct incentives such as cash subsidies for activities that destroy biodiversity. It also requires changing indirect incentives such as laws in several developing countries that still require people to cut down forests in order to get clear title to the land. Another way to level the playing field is for policy makers to create local, national, and international incentive mechanisms that support long-term private conservation such as payments for environmental services including carbon sequestration, carbon storage, and watershed protection among others. Evidence has shown that, given the opportunity, private protected areas can compete financially with alternative land uses.
- *Develop institutional capacity in the public and private sectors*. It seems that even when supportive legislation and programmes exist for private protected areas, implementation by government agencies tends to be weak. Governments should thus

invest greater resources in programmes that support private conservation, with an emphasis on providing sufficient human and financial resources to implement policies and programmes fully and on concerted monitoring and evaluation of private protected areas to ensure quality. Within the private sector, NGOs, community groups, and others should dedicate resources to creating new private protected area initiatives, or taking existing ones to new heights.

There is no doubt that private protected areas are now playing an increasingly important role in the conservation of the world's biodiversity. The implementation of the above and other recommendations will ensure their continued growth and expansion. The next sub-section looks at the definition and classification of private protected areas.

3.7.2 Definition and classification of private protected areas

Carter et al (2008) note that there is no single definition of a private protected area, and a varied terminology exists including terms such as private conservancy, private park and private reserve, among others. Private protected areas consist of multiple approaches for different niches and purposes which makes definition, generalisation and categorisation problematic (Iftekhar et al, 2014; Langholz, 2009). Considerable ambiguity surrounds privately owned nature reserves, with their diversity allowing for categorisation under numerous conservation trends such as community-based conservation, devolution, decentralisation, privatisation, conservation easement, conservation covenant, participation, and sustainable development (Gordon et al, 2011; Iftekhar et al, 2014; Langholz, 2003; Miteva et al, 2012; Six, 2013). Further compounding this is the fact that private reserves are often self-defined where, for example, an area viewed by one landowner as a parcel of unused jungle may be considered a protected natural area by another (Langholz, 2003).

The World Parks Congress defined private protected areas as land parcels of any size that are predominantly managed for biodiversity conservation, protected with or without formal government recognition and owned or otherwise secured by individuals, communities, corporations or NGOs (Carter et al, 2008; Langholz, 2009; Mitchell, 2005). However, these categories of ownership overlap with the four governance categories also adopted by the World Parks Congress indicated earlier, namely: the state, private owners, indigenous and local communities, and protected areas co-managed by groups of stakeholders (Carter et al, 2008; Mitchell, 2005; Miteva et al, 2012). Private protected areas involve activities outside

the public sector that are independent of government control, and usually, but not always, carried out for profit (Carter et al, 2008). There is a wide range of private operators including individual or family owned businesses; publicly listed companies; organisations with management structures that rely on donations from private entities, corporations, or membership subscriptions independent of state funds; and organisations with independent management structures that may receive funding from government but having an ability to refuse such funds (Carter et al, 2008; Gordon et al, 2011; Iftekhar et al, 2014). The enterprises mentioned above may own and manage a private protected area or may simply manage land owned by another party, with enterprises owning and managing private protected areas enjoying much greater control and freedom of action (Carter et al, 2008). Many private sector conservation enterprises are managing land they do not own (Duncan et al, 2014; Gordon et al, 2011; Iftekhar et al, 2014; Knoot and Rickenbach, 2014; Six, 2013), with many state owned protected areas in Africa, for example, being managed under contract by private companies (Carter et al, 2008). In other contexts, private enterprises have entered into alliances with local communities in developing private protected areas on community held land, with the private operator managing the area while providing the community owning the land with dividends from ecotourism operations (Carter et al, 2008; Hanley et al, 2012; Miteva et al, 2012; Tyrväinen et al, 2013).

Carter et al (2008: 178) have also defined a private protected area as "an area of land of conservation importance that is directly under the ownership and/ or management of a private sector conservation enterprise for the purpose of biodiversity conservation". They further state that the purpose of the protected area may solely be conservation or it may be conservation concurrent with other objectives such as profit making or social goals.

Equally challenging is the categorisation of private protected areas. Langholz and Lassoie (2001 cited in Langholz, 2003: 120-121) came up with a 10 sub-category private protected area typology combining the purpose of the protected areas with the identity of the owner (Table 3.7).

Table 3.7: Proposed typology for private nature reserves worldwide

Type	Category	Management Objective
I	Formal Park	Protect nature, as a formally recognised unit in a national protected area system. Must be legally gazetted through legislation or executive decree. Includes monitoring and evaluation by government.
II	Programme Participant	Participate in a formal, voluntary incentive programme designed to promote biodiversity conservation on private lands. Programme includes restrictions on land use. Not as formal or as lasting as Type I.
111	Ecotourism Reserve	Combine nature conservation with tourism. Tourism is a principal revenue generator, and takes place on part or all of the landholdings.
IV	Biological Station	Combine nature conservation with scientific research. Reserve serves as outdoor laboratory. May incorporate scientific and other forms of tourism, as well as education.
V	Hybrid Reserve	Protect nature as one of a diverse land use strategy. Often large ranches combining agriculture, forestry, or cattle ranching, with reserve providing watershed protection and other amenities.
VI	Farmer-owned	Safeguard water sources and other locally accrued environmental services, at the individual or family level. Usually informal, small (<20 hectares), and not involved in tourism industry.
VII	Personal Retreat Reserve	Maintain a natural area as a personal haven, at the individual or family level. Frequently owned by urbanites who purchase or inherit land in a rural area, and who are not reliant on the reserve for income generation. Often the site is a second home.
VIII	NGO Reserve	Protect nature under the auspices of a local, national, or international non-profit conservation organisation. Base of support is broader than that of most other reserve types.
IX	Hunting Reserve	Maintain natural area for purpose of sustainable wildlife utilisation. Animals are collected for trophies and/or meat production. Includes game ranches and lands owned by hunting clubs.
X	Corporate Reserve	Protect nature as a tool for creating favourable publicity. Often owned by large multinational corporations, especially when their primary activities typically degrade natural resources.

Source: Langholz and Lassoie (2001 cited in Langholz 2003: 120-121)

According to Carter et al (2008), the major weakness of the above classification by Langholz and Lassoie is that neither the actual form of tenure (ownership, lease, customary tenure, management agreement) nor the extent of control (the freedom of operation of the managers, such as exercising trespassing laws against unauthorised entrants, through to mixed use, open access areas) are specified. Basing on their study of East African private protected areas, Carter et al (2008) have since come up with another 10 sub-category private protected area

categorisation system mixing land ownership, management organisation, and relationship between management organisation and landholder (Table 3.8) in a bid to try and improve on the earlier typology by Langholz and Lassoie.

Table 3.8: A typology of private protected area categorisation

Category	Landholder	Management Organisation	Relationship of management Organisation to landholder	Name
1a	Individual	Individual	Same: management agent as landholder	Individual Private PA
1b	Individual	Individual	Operator different from landholder	Private PA
2a	Business corporation	Business corporation	Same: operator is landholder	Private Corporate PA
2b	Business corporation	Business corporation	Operator different from landholder	Corporate PA
3	Conservation trust	Conservation trust	Same: operator is landholder	Conservation Trust PA
4a	Community trust	Community	Same: operator is landlord	Community-Controlled PA
4b	Community trust	Individual, business corporation, conservation thrust	Leasehold, joint tenure with owners, management agreement, concession	Joint Private-Community PA
4c	Community trust	Community or community-owned business	Leasehold or management agreement	Community PA
5a	State	Individual, business corporation, conservation thrust	Leasehold, joint tenure with state, management agreement, concession	Conservation Concession
5b	State	Community or community-owned business	Leasehold, joint venture with owners management agreement, concession	Community Conservation Concession

Source: Carter et al (2008: 184)

However, the above typology by Carter et al (2008) does not include the management purpose or management effectiveness of the private protected area. In their own criticism, Carter et al (2008) note that the titles given to the range of private protected areas in their typology do not indicate the level of control (low, medium, high) that the management organisation has over the private protected area. Ironically, some of the same weaknesses in the typology by Langholz and Lassoie (2001) that were indicated by Carter et al (2008) are

also in their categorisation system. However, Carter et al (2008) are quick to note that their typology is preliminary and offered as a basis for debate, refinement and adaptation to various contexts.

From the foregoing, it is clear that the task of defining and classifying private protected areas, just as with protected areas in general, is not an easy one. However, such a difficulty should not be allowed to cloud the increasing role that private protected areas are now playing in the conservation of the world's biological diversity. Instead, the challenge in defining and classifying private protected areas is a reflection on their wide diversity in terms of management purpose, level of control, form of tenure, and management effectiveness among other attributes.

3.7.3 Strengths and weaknesses of private protected areas

Like all conservation tools, private parks bring both advantages and disadvantages to the areas in which they are established. While some view them as a panacea, a Holy Grail of conservation and development, skeptics on the other hand have raised concern about their small size, their frequent dependence on highly sensitive ecotourism for revenue, and the overall untrustworthiness of the private sector (Iftekhar et al, 2014; Langholz, 2002; Langholz, 2003). Langholz (2002) has provided a succinct overview of some of the social, economic and ecological strengths and weaknesses of the private reserve model and the discussion below is largely drawn from his work.

The main social strength of private protected areas is that they incorporate two important social themes in conservation and development with respect to resource control, that is, participation and devolution (Hanley et al, 2012; Langholz, 2002; Langholz, 2003). Private nature reserves represent a bold step towards devolution of resource control to the rural poor and other citizens by involving them as stewards of their countries' natural resources (Coria and Calfucura, 2012; Langholz, 2003). Colombia's network of well-organised private reserves is evidence to the above (Langholz, 2003). In addition, private protected areas represent participation taken to the extreme in which locals control decision-making where residents "own the table instead of merely being offered a place at it" (Langholz, 2003: 125).

One of the social weaknesses of private nature reserves is that they can become islands of elites where wealthy landowners host wealthy tourists (Holmes, 2013; Langholz, 2002; Langholz, 2003). Such a situation may lead to resentment and discontent among the locals

(Langholz, 2003; Wearing, 2001). Another key negative social consequence has to do with the alteration of local cultural norms and behaviours, which requires private protected areas, and protected areas in general, to embody cultural sensitivity and develop meaningful links with surrounding communities interacting with visiting foreign tourists (Coria and Calfucura, 2012; Jalani, 2012; Langholz, 2003; Miteva et al, 2012; Youdelis, 2013).

Private reserves can also result in the concentration of land into the hands of a few large landholders thereby crowding out the rural poor (Langholz, 2003). Incentives in support of private reserves may also unwittingly help large landowners maintain their holdings (Hanley et al, 2012; Langholz, 2003). For example, wealthy white South African landowners were declaring their lands as conservation areas in order to avoid government land redistribution (Holmes, 2013; Langholz, 2003).

Another social disadvantage of private reserves involves foreign ownership (Holmes, 2013). For example, a study revealed that 33% of private reserves in Africa were foreign-owned, with an additional 7% being jointly owned by nationals and foreigners (Langholz, 2003). The same study also found 23% of private protected areas in Latin America to be completely foreign owned, with another 25% being owned through partnerships with foreigners. Indeed, many landholding NGOs have expanded their operations to developing countries while wealthy individuals have also purchased land to establish private reserves and conservancies (Carter et al, 2008). Such foreign presence may be viewed as a form of neo-colonialism (Holmes, 2013; Langholz, 2003), especially when the foreign owners in question are from the formerly colonising countries. Land concentration, resentment against the wealthy, and an anti-foreign sentiment were key factors leading to the fast-track land reform programme in Zimbabwe in 2000 targeting large white-owned commercial farms including game ranches and conservancies (Chavunduka and Bromley, 2013; Gandiwa et al, 2014; Langholz, 2003).

With many governments in developing countries increasingly lacking financial and other resources needed for the conservation of biodiversity, private reserves represent an important avenue for distributing the costs of conservation (Holmes, 2013; Horwich and Lyon, 2007; Langholz, 2003; Langholz, 2009). Private protected areas can also be quite profitable, allowing the owner to concurrently earn a living while also protecting natural resources (Holmes, 2013; Langholz, 2002).

The economic disadvantages of private nature reserves, however, lie in their over-reliance on ecotourism for revenue (Borgerhoff Mulder and Coppolillo, 2005; Jalani, 2012; Langholz, 2002; Leisher et al, 2010; Youdelis, 2013). Considering the sensitivity of tourism to negative developments such as political instability, terrorism, and economic decline, ecotourism can expose some private parks, and the local communities dependent on it, to economic vulnerability (Jalani, 2012; Leisher et al, 2010; Youdelis, 2013). In addition, an overemphasis on economics in pursuit of the need to attain financial self-sufficiency by some private reserve owners may jeopardise the ecological goal which is often the primary reason for their establishment (Langholz, 2002).

Ecologically, the emergence of conservation on private lands has been hailed as an effective and powerful conservation option to often underfunded and poorly managed state parks (Bond, 2004; Carter et al, 2008; Holmes, 2013; Langholz, 2009; Nelson, 2010). Central state agencies have often mismanaged natural resources due to both insufficient capacity and misaligned incentives which have often led to the appropriation of public assets for private gain and patronage (Nelson, 2010). Centralised state ownership of natural resources such as wildlife, forests and fisheries has at times also led to conditions of open access exploitation as central capacity to enforce restrictions on use has not matched the state's claims to property (Nelson, 2010). The main ecological weakness of private protected areas, however, is their often small size, which limits their ability to support biodiversity, especially megafauna (Langholz, 2002), and thus are inadequate for maintaining spatially heterogeneous biodiversity (Kreuter et al, 2010).

In spite of the above noted weaknesses, private protected areas have emerged as an important biodiversity conservation tool across the world. In addition, given their wide diversity, such sweeping generalisations on their weaknesses are somewhat unwarranted.

3.8 Protected areas and local livelihoods

According to Scherl et al (2004), the primary goal of most protected areas is to conserve biological diversity and provide ecosystem services, and not to reduce poverty. They, however, further argue that an examination of the linkages between protected areas and issues of poverty in developing countries has become a practical and ethical necessity. Practically, for protected areas in poorer countries to survive, they must be seen as a land use option that contributes positively to sustainable development as other types of land use (Gurney et al,

2014; Scherl et al, 2004). Ethically, human rights and aspirations need to be incorporated into national and global conservation strategies if social justice is to be realised (Rastogi et al, 2010; Scherl et al, 2004).

In tune to the above, an increasingly vocal proportion of the conservation community believes that allocating land for biodiversity conservation needs to be reconciled with sustainable use at the local level (Gurney et al, 2014; Pinho et al, 2014; Romero et al, 2012; Scherl et al, 2004; Turner et al, 2012; Walpole and Wilder, 2008). Unless they become more relevant to countries development strategies and the rights and needs of local people, many protected areas will come under increasing threat (Andam et al, 2010; Gurney et al, 2014; Meilby et al, 2014; Scherl et al, 2004). Historically, the creation of protected areas with strong prohibition on resource use has been a defining feature of conservation (Adams and Hutton, 2007; Bennett and Dearden, 2014; Buta et al, 2014). As shown earlier, popularly known as the 'Yellowstone model' or 'fortress conservation', this exclusionary approach started in the USA and was exported across the world in diverse colonial settings and was embraced by most governments in the developing tropics after independence (Brockington et al, 2008; Chape et al, 2005; Neumann, 1998). The approach is typically characterised by the forced removal of people so as to make way for protected areas. Socio-economic impacts on affected groups include physical displacement, economic displacement through restriction on resource use, and cultural displacement through restricted access to locations of cultural and symbolic value (Bennett and Dearden, 2014; Brockington and Igoe, 2006; Clements et al, 2014; Igoe, 2006; Miller et al, 2011). While the displaced people are relocated close to the newly created protected area, annoyance by wildlife in the form of destruction of crops and livestock, and even loss of human life, are constant challenges (Brockington and Igoe, 2006; Clements et al, 2014; Igoe, 2006; Liu et al, 2011).

While some conservationists continue to support a completely exclusionary approach, and even advocating for civil powers to help (Terborgh et al, 2002), a constant call in the literature is increasingly for conservation to be integrated with local livelihoods enhancement (Miller, 2014). Recommendation 5.29 of the 5th IUCN World Parks Congress states that "protected areas should not exist as islands, divorced from the social, cultural and economic context in which they are located" (Scherl et al, 2004: 3). The above trends have spurred an emergence in the conservation literature of terms such as 'pro-poor conservation', 'conservation with a human face', community conservation', conservation and development',

'parks for people', among other associated terminologies (Niedziałkowski et al, 2014; Roe and Elliot, 2006; Wilshusen et al, 2003).

3.8.1. Protected areas and the international sustainable development agenda

Linkages between development and conservation were recognised in the 1970s and early 1980s, culminating in the formulation of the World Conservation Strategy led by IUCN and other institutions (Miller, 2014; Romero et al, 2012). The World Conservation Strategy recognized the finiteness of natural resources, and the need for ensuring their sustainable use (Romero et al, 2012). Recognition of the importance of biodiversity conservation and its linkages to global development issues has increased significantly during the approximately four and a half decades since the 1972 Stockholm Conference on the Human Environment (Niedziałkowski et al, 2014; Scherl et al, 2004). It was agreed at Stockholm that natural resources are essential assets on which economic growth must be based and that conservation and development are inextricably linked (Scherl et al, 2004).

A decade later after Stockholm, the 1982 World Congress on Parks and Protected Areas in Bali marked a major turning point in conservation practice by encouraging approaches that promoted greater local participation and sustainable use of resources (McNeely and Miller, 1984; Niedziałkowski et al, 2014; Scherl et al, 2004). The fifth objective of the Bali Action Plan was on the promotion of a linkage between protected area management and sustainable development and Recommendation 5 specifically recognised that people living in or near protected areas can support protected area management "if they feel they share appropriately in the benefits flowing from protected areas, are compensated appropriately for any lost right, and are taken into account in planning and operations" (Recommendation 5, World Parks Congress, Bali cited in Scherl et al, 2004: 5).

The importance of integrating biodiversity conservation with sustainable economic development was further underscored in 1987 in the report issued by the World Commission on Environment and Development, *Our Common Future*. The report coined the term 'sustainable development' and gave it its global buzzword status it now enjoys (Brundtland, 1987; Bravo, 2014; Holden et al, 2014).

A more formal international commitment to the goals of conservation and development was forged at the 1992 UNCED (the Rio Earth Summit) when countries drafted the CBD to address the loss of biodiversity and develop mechanisms for funding (Agol et al, 2014; Glenn

et al, 2010; Holden et al, 2014; Sachs et al, 2009; Scherl et al, 2004; Turner et al, 2012). The CBD has three primary objectives, namely: conservation of biological diversity, sustainable use of the components of biodiversity, and fair and equitable sharing of the benefits arising out of the utilisation of genetic resources (Naughton-Treves et al, 2005; Niedziałkowski et al, 2014). In its preamble, the CBD clearly states that "economic and social development and poverty eradication are the first and overriding priorities of developing countries" (Scherl et al, 2004: 18). Article 8 of the CBD on in situ conservation calls for systems and measures for protected areas to conserve and sustainably use biological diversity, as well as requiring countries to promote efforts to support "environmentally sound and sustainable development in areas adjacent to protected areas, with a view to furthering protection of these areas" (Scherl et al, 2004: 18). McNeely (2004) notes that the CBD provides a legislative justification for linking poverty issues to conservation and also acknowledges that poverty can pose a threat to the survival of protected areas.

The recognition that natural resources are important for sustainable development was further underscored in 2000 by the adoption of the MDGs aimed at reducing poverty in the world's poorest countries by 2015 (Sachs et al, 2009; Scherl et al, 2004). Among the eight goals is MDG 7 which seeks to integrate sustainable development with national policies and also to reduce the degradation of natural resources (Organisation for Economic Cooperation and Development - OECD, 2002; Sachs et al, 2009; Scherl et al, 2004). MDG 7 is, however, not just concerned about biodiversity conservation but also the attainment of other goals such as income, hunger alleviation and access to water (Scherl et al, 2004) and biological resources will certainly play a significant part towards the achievement of these goals.

The UN Summit on Sustainable Development held in Johannesburg in 2002 was a follow-up to Rio. Biodiversity was further recognised as the foundation for sustainable development inseparably linked with economics and development (Holden et al, 2014; Jeffries, 2006).

Furthermore, the 5th World Parks Congress held in Durban, South Africa, in September 2003 highlights the centrality of national parks for biodiversity conservation and sustainable development (IUCN, 2003). With the theme 'Benefits Beyond Boundaries', it was emphasised that areas must be protected not against people, but for people, and should play a major role in achieving sustainable development and ensuring that they alleviate, and not exacerbate, poverty (IUCN, 2003; Mombeshora and Le Bel, 2009; Niedziałkowski et al, 2014).

In spite of the enormous and growing international support for socially just conservation, the situation on the ground does not reflect much of such support (Andam et al, 2010; Fortwangler, 2003; Igoe, 2006). The effect of national parks and various other protected areas on their human neighbours is arguably the most controversial debate in conservation policy (Andam et al, 2010; Chan et al, 2007). Many communities continue to endure forced eviction, fear and torture, and lack of access to resources from protected areas (Bennett and Dearden, 2014; Brockington and Igoe, 2006; Clements et al, 2014; Fortwangler, 2003; Igoe, 2006; Liu et al, 2011; Miller et al, 2011). Examples of people who have been forced to relocate from their lands in order to make way for protected areas abound. In Botswana, more than a thousand San were relocated from the Central Kalahari Game Reserve in 1997 to settlements outside the reserve (Hitchcock, 2002). The Twa people were evicted to make way for the Kahuzi-Biega National Park in eastern Democratic Republic of Congo (Lewis, 2000). They now live in squatter camps around the park and a rise in malnutrition and disease has been reported by Barume (2000). In India, the forest department and the police forcefully dislocated 81 families from the Kolengere tribal settlement in Nagarhole National Park to a new site at the fringes of the park (World Rainforest Movement, 2000a).

Protected area personnel have tortured and intimidated people to force policies (Fortwangler, 2003; Igoe, 2006; Liu et al, 2011; Miller et al, 2011; World Rainforest Movement, 2000b). Ethnic minorities in or near protected areas are especially vulnerable to such tactics, particularly when the enforcers are from a dominant group (Fortwangler, 2003). Hitchcock (1994) reports that many innocent people in Zimbabwe, Zambia, Namibia and Botswana were killed and tortured by game guards. Such force or torture may be used during 'negotiations' over protected areas (Fortwangler, 2003). For example, in 1991 government officials threatened to imprison community leaders if they did not cooperate with a proposal concerning Khunjerab National Park in Pakistan (Fortwangler, 2003; Knudsen, 1999).

Access to resources has often been restricted following the creation of most protected areas thereby creating difficulties for people that have relied on such resources for their livelihoods (Andam et al, 2010; Ferraro et al, 2011; Igoe, 2006; Miller et al, 2011; Sanderson and Redford, 2004). The establishment of most Tanzanian national parks, for example, has resulted in restriction of access to lands and resources (Neumann, 2000), while approximately 23% of land in India had been turned to state parks by 1980 resulting in the loss of land rights by millions of rural resource users (Poffenberger, 1994). Other policies stop or limit land

cultivation, hunting, grazing, and access to migrating wildlife (Fortwangler, 2003; Sanderson and Redford, 2004). For example, the creation of Khunjerab National Park in Pakistan eroded traditional rights of the Wakhi to graze domestic animals and hunt wildlife (Knudsen, 1999), while the creation of Chobe National Park in Botswana blocked the access of the Ts'exa to seasonal migrations of wildlife (Taylor, 2002). While restricted access to resources can be an effective way to protect biodiversity, it can cause immense suffering to affected communities who had always relied on such resources for a livelihood (Ferraro et al, 2011; Fortwangler, 2003; Igoe, 2006). Measures should therefore be adopted so as to allow for some sustainable use or for the provision of alternative livelihoods support mechanisms for affected communities. Compensation for denied access to resources could be in the form of park employment, social services provision, fuelwood plantations, production and marketing assistance for agricultural commodities among other initiatives (Bulte and Rondeau, 2007; Chaminuka et al, 2014; Koch, 2004; Schwerdtner and Gruber 2007; Tacconi, 2007).

Human-wildlife conflicts are also among the challenges faced by communities located close to protected areas. Large-bodied mammals such as large carnivores, ungulates, primates and elephants are particularly prone to conflicts with humans as their expansive home-range needs force them to directly compete with people for limited space and resources (Goswami et al, 2014; Liu et al, 2011). They possess the capacity to cause considerable harm to humans and damage to their property (such as crops and livestock), which may exacerbate the poverty profile of affected communities (Liu et al, 2011; Muhly and Musiami, 2009). Wildlife may also transmit diseases such as foot and mouth, anthrax and rabies, among others, to both livestock and humans, in addition to increasing competition for grazing and costs of foregone opportunities when land is used for wildlife (Chaminuka et al, 2014). Human-wildlife conflicts often spur retaliatory killing and/ or poaching, which may be major threats to some wildlife species (Liu et al, 2011; Watson et al, 2013). The above scenario presents a strong argument why protected areas should seriously incorporate livelihoods goals. An increasingly popular strategy for reducing human-wildlife conflict has been the erection of fences to separate protected areas from surrounding human populations, even though fencing protected areas to promote conservation has been viewed as a contentious issue (Hayward and Kerley, 2009; Massey et al, 2014). While fencing may be helpful in reducing human-wildlife conflicts, recent studies have shown that they have ecological costs through the blocking of migration routes and restriction of biodiversity range use which may result in overabundance, inbreeding and isolation (Craigie et al, 2010; Hayward and Kerley, 2009; Massey et al, 2014).

Damage compensation may also be used as a tool with which to distribute the costs between those who benefit from conservation and those who must suffer the costs of damage (Bulte and Rondeau, 2007; Schwerdtner and Gruber, 2007). Compensation schemes can be arranged in two different types: either as ex-post compensation, where the damage is compensated after it has occurred; or as compensation in advance, where payments are based on an estimation of the expected loss and are received independently from its actual occurrence (Schwerdtner and Gruber, 2007). Compensation can be relatively cheap to implement in poverty-stricken areas and is readily accepted by local communities (Bulte and Rondeau, 2007).

As highlighted above, the road towards socially just conservation is still bumpy and full of many roadblocks and obstacles (Andam et al, 2010; Fortwangler, 2003). More effort is needed at national, regional, and international levels if meaningful results are to be realised on the ground. Conservationists should understand that protected areas cannot survive as islands amidst abject poverty without being seen to be doing something towards improving the lives of the people. This is because local communities adjacent to national parks and protected areas are increasingly perceived as having a substantial role in achieving conservation and sustainability goals, due to their on-going interactions, through resource uses, recreation opportunities, and familiarity with surrounding environments (Buta et al, 2014).

3.8.2 Biodiversity-poverty linkages

Over recent decades, biodiversity conservation and poverty reduction have both become international societal and political goals (Barrett et al, 2011; Roe et al, 2010; Turner et al, 2012). As shown earlier, the CBD, agreed in 1992, was drafted so as to reduce biodiversity loss, while the Development Assistance Committee of the OECD developed the seven poverty-focused MDGs in 2000 (Roe et al, 2010; Sachs et al, 2009; Turner et al, 2012). The close link between the two has already been highlighted earlier.

The MEA, published in 2005, further emphasises the link between biodiversity and poverty reduction (Roe et al, 2010). The MEA views biodiversity as underpinning the delivery of a wide range of ecosystem goods and services on which human well-being depends (MEA, 2005a; Pinho et al, 2014). It is worth noting that, globally, more than 1.6 billion people depend to varying degrees on forests for their livelihoods (Pinho et al, 2014).

Despite this apparent convergence at the international policy level, there is considerable divergence of opinion at the practical level as to the nature and scale of biodiversity-poverty links and the roles and responsibilities of different interest groups in addressing these linkages (Roe et al, 2010). Roe et al (2010) further note that one of the reasons for this divergence of opinion is that there is no single, linear relationship between biodiversity and poverty. It varies markedly from context to context. The numerous frameworks for analysing biodiversity-poverty relationships (Adams et al, 2004; Nadkarni, 2000; Roe and Elliot, 2005) reveal an unsurprisingly complex relationship with mixed results not amenable to easy generalisation (Roe et al, 2010; Sachs et al, 2009). The diverse relationships between biodiversity and poverty are explored below.

3.8.2.1 Poor people disproportionately depend on biodiversity

Indeed, poor people depend on biodiversity as already shown earlier, but so does the rest of humanity. Poor people, however, appear to be particularly dependent on the natural resource environment for their livelihoods (Nadkarni, 2000; Pinho et al, 2014; Roe and Elliot, 2005). Most studies on the dependence of the poor on biodiversity are, however, very context specific with little quantitative data aggregated at local, regional or national levels (Roe and Elliot, 2005).

Many of the studies highlighting dependence on biodiversity use income from biodiversity-based resources calculated as a percentage of total household income as their indicator of the extent of dependency (Vira and Kontoleon, 2010), and Table 3.9 offers a summary of some of these studies. Table 3.9 shows that there is a significant, albeit varied, dependence on biodiversity-based resources for income in the selected regions. It is important to note that all the regions shown are in the developing world and therefore are home to many of the poorest people of the world with a great part of their GDP being generated out of the use of natural resources (Nadkarni, 2000).

Table 3.9: Evidence on dependence on biodiversity for income

Source	Region	Evidence	Resource type
Bahuguna (2000)	South Asia	48.7% of household income	Forests: fuel, fodder, employment
Bene *et al (*2009)	West Africa	Varies from 90% (poorest)-29.7% (richest)	Fish
Cavendish (2000)	Southern Africa	35.4% of household income in 1993-94; 36.9% in 1996-97	Wild foods, wood, grasses and other environmental resources
Coomes *et al. (*2004)	Latin America	20% of household income	Fish, palm products, timber, hunting
de Merode *et al (*2004)	West Africa	24% of cash sales	Wild foods
Fisher (2004)	Southern Africa	30% of household income	Forests
Jodha (1990)	South Asia	14-23% of total household income	Common pool resources
Kamanga *et al (*2009)	Southern Africa	15% of total household income	Forests
Levang *et al (*2005)	South-east Asia	30% of total household income	Forests
Mamo *et al (*2007)	East Africa	39% of total household income	Forests
Narain *et al (*2008a)	South Asia	Quartile1: 9%, Quartile2: 7.2%; Quartile 3: 7.9%; Quartile 4: 8% of permanent income	Fuelwood, dung for fuel, manure, fodder, construction wood
Shaanker *et al (*2004)	South Asia	Site 1: 16%, Site 2: 24%, Site 3: 59% of household income	Non-Timber Forest Products (NTFPs)
Viet Quang and Anh (2006)	South-east Asia	For 30% of households, over 50% of total income; further 15%, 25-50% of total income	NTFPs

Source: Vira and Kontoleon (2010: 18)

Other studies have used the proportion of households engaged in particular types of activities as an indicator of the depth of dependence on biodiversity (Vira and Kontoleon, 2010), the findings of which are summarised in Table 3.10. Table 3.10 shows that the depth of dependence on various types of biological resources among households in the developing world is quite high, with some indication of higher dependence among poorer households.

Table 3.10: Evidence on depth of dependence on biodiversity

Source	Region	Evidence	Resource type
Coomes *et al (*2004)	Latin America	66% of households depend on resource extraction	Fish, palm products, timber, hunting
Dovie *et al (*2007)	Southern Africa	98% of households use NTFPs	Non-Timber Forest Products (NTFPs)
Dovie *et al (*2007)	Southern Africa	91% of households use wild herbs	Wild herbs
Glaser (2003)	Latin America	68% of households depend on mangroves	Mangrove resources, especially crabs and fish
Jha (2009)	South Asia	70% of households depend on beedi making or firewood	Forests
Jodha (1990)	South Asia	84-100% of poor depend on CPRs	Common pool resources
Jodha (1990)	South Asia	10-19% of rich depend on CPRs	Common pool resources
Levang et al (2005)	South-east Asia	72% of households depend on forest products	Forests
Mamo *et al (*2007)	East Africa	42% of households depend on forest for grazing	Forests
Narain *et al (*2008a)	South Asia	Quartile1: 77.5%, Quartile 2: 81.5%; Quartile 3: 72.8%; Quartile 4: 61.4% of households collect NTFPs	Fuel wood, dung for fuel, manure, fodder, construction wood
Shackleton and Shackleton (2006)	Southern Africa	96-100% of households purchase NTFPs	NTFPs
Shackleton and Shackleton (2006)	Southern Africa	8% (rich), 15% (middle), 36% (poor) households sell NTFPs	NTFPs
Sharma *et al (*2009)	South Asia	75% of household fuel and fodder needs from forests	Forests

Source: Vira and Kontoleon (2010: 19)

Evidence on the relative dependence of richer and poorer groups on biodiversity-based resources has been the subject of considerable interest, and is somewhat mixed (Table 3.11) (Vira and Kontoleon, 2010). Earlier studies suggested unanimously that the poor were disproportionately dependent on biodiversity, and this became accepted wisdom (Cavendish, 2000; MEA, 2005b; Pinho et al, 2014). More recent studies, however, now question such a stance. For example, some complementarity has been documented between asset ownership and the use of certain types of biological resources (Adhikari et al, 2004; Coulibaly-Lingani et al, 2009; Narain et al, 2008; Vira and Kontoleon, 2010), with asset rich households found to be depending more on certain natural resources. Vira and Kontoleon (2010) argue that if this difference in asset ownership is further reflected in greater political power at the local

level, rich households are also able to use their dominance to secure access to resources and to exclude the relatively poor.

Vira and Kontoleon (2010) further note that the difference in political power between the rich and the poor points to another reason why resource use may be skewed in favour of the rich. While a biodiversity-based resource remains relatively low-value, rich users tend not to feel the need to restrict access, but are more likely to exclude the poor from access when returns from certain resources increase (Vira and Kontoleon, 2010). Under such circumstances, the poor appear to be linked with low-value resource use, which may serve to perpetuate poverty (Angelsen and Wunder, 2003; Vira and Kontoleon, 2010). Biodiversity resource dependence in this case will now be a symptom of poverty and the poor can only escape the poverty trap by looking for alternative livelihood sources other than biodiversity (Ferraro et al, 2011; Levang et al, 2005; Vira and Kontoleon, 2010).

Table 3.11: Evidence of relative dependence of rich/poor on biodiversity resources

Reference	Region	Resource	Relative dependence
Adhikari *et al(* 2004)	South Asia	Fodder	Increases with wealth
Adhikari *et al (*2004)	South Asia	Leaf litter	Increases with wealth
Babulo *et al (*2008)	East Africa	Forests	Decreases with wealth
Bene et al. (2009)	West Africa	Fish	Decreases with wealth
Cavendish (2000)	Southern Africa	Multiple	Decreases with wealth
Coomes *et al (*2004)	Latin America	Hunting	Increases with land ownership
Coomes *et al (*2004)	Latin America	Palm fruit	U-shaped: first decreases then increases with wealth
Coulibaly *et al (*2009)	West Africa	Forests	Increases with wealth
De Merode *et al (*2004)	West Africa	Bush meat	Consumption/sale increases with wealth
De Merode *et al (*2004)	West Africa	Fish	Consumption/sale increases with wealth
De Merode *et al (*2004)	West Africa	Wild plants	Consumption/sale decreases with wealth
Fisher (2004)	Southern Africa	Low return forest activities	Decreases with wealth
Fisher (2004)	Southern Africa	High return forest activities	Increases with wealth
Fu et al (2009)	Other Asia	NTFP	Decreases with wealth
Jha (2009)	South Asia	Firewood	Decreases with wealth
Jha (2009)	South Asia	Beedi making	Increases with wealth
Jodha (1990)	South Asia	CPRs	Decreases with wealth
Kamanga *et al (*2009)	Southern Africa	Forests	Decreases with wealth
Levang *et al (*2005)	South-east Asia	Forests	Decreases with wealth
Mamo *et al (*2007)	East Africa	Forests	Decreases with wealth
Narain *et al (*2008a)	South Asia	Fodder, construction wood	Increases with wealth
Narain *et al (*2008a)	South Asia	Fuel, dung fuel, dung manure	Decreases with wealth
Paumgarten and Shackleton (2009)	Southern Africa	NTFP	Sale decreases with wealth
Reddy and Chakravarty (1999)	South Asia	Forests	Decreases with wealth
Sapkota and Oden (2008)	South Asia	Forests	Decreases with wealth
Shaanker *et al (*2004)	South Asia	NTFP	Decreases with wealth
Shackleton and Shackleton (2006)	Southern Africa	NTFP	Sale decreases with wealth
Shackleton and Shackleton (2006)	Southern Africa	Fuelwood	Consumption decreases with wealth
Shackleton and Shackleton (2006)	Southern Africa	Edible herbs	Consumption decreases with wealth
Sharma et al (2009)	South Asia	Forests	Decreases with wealth
Viet Quang and Anh (2006)	South-east Asia	NTFP	Decreases with wealth

Source: Vira and Kontoleon (2010: 21)

The table shows that the poor tend to depend more on biological resources compared to the richer. However, as discussed earlier, the richer also tend to depend more on fewer but higher-value natural resources, or indirectly through consumption of goods produced or gathered by the poor.

3.8.2.2 The geographical overlap between biodiversity and poverty: the ecogeography of poverty

Claims are commonly made that the poor are distributed in areas of high biodiversity (Fisher and Christopher, 2007; Gurney et al, 2014; Meilby et al, 2014; Pinho et al, 2014; Redford et al, 2008; Turner et al, 2012). The claim is made in a variety of ways, including the coincidence of poor countries and the majority of the world's biodiversity in the Southern hemisphere (Barrett et al, 2011; Fisher and Christopher, 2007; Redford et al, 2008; Roe and Elliot, 2005; Zenteno et al, 2013). Such a claim of a spatial link between biodiversity and poverty is often presented as a basic rationale why biodiversity conservation and poverty reduction should be pursued jointly (Barrett et al, 2011; Roe et al, 2008; Turner et al, 2012). However, it is probably too simplistic to claim that the majority of the world's biodiversity is in the Southern hemisphere, which is also where the poorer countries of the world are (Redford et al, 2008; Roe et al, 2010; Roe and Elliot, 2005). For example, countries such as the USA and Australia are also extremely rich in biodiversity, which clearly shows that there is no simple linear relationship between areas of high biodiversity and poverty (Roe and Elliot, 2005). Yet there is mounting evidence to suggest that, at a variety of scales and in many different ways, biodiversity and poverty do coincide (Roe et al, 2010). At regional and national scales, it is clear that many countries and regions with high biodiversity also have high levels of poverty (Wilshusen et al, 2003) (Table 3.12), and this is particularly true of sub-Saharan Africa and Asia which have the greatest proportion and number of poor people respectively (Roe et al, 2010). Wilshusen et al (2003: 1) further notes that "…most areas considered to be high priority biodiversity hotspots are also social and political hotbeds" featuring high levels of poverty, insecure land tenure, landlessness and undemocratic political systems (Wilshusen et al, 2003). There is therefore a real danger that nature protection interventions could exacerbate the social conditions of the resource-dependent poor communities (Bennett and Dearden, 2014; Clements et al, 2014; Liu et al, 2011; Miller et al, 201; Wilshusen et al, 2003).

Table 3.12: Human poverty indicators for selected biodiversity 'hotspot' countries

Country	Adults not surviving up to the age of 40 (%) 1998	Adult literacy (%) 1998	Safe Water access (%) 1998	Health Service access (%) 1998	Sanitation access (%) 1998
Madagascar	21.8	35.1	32	-	-
Ivory Coast	37.0	55.5	58	40	61
Indonesia	12.3	14.3	26	57	47
Philippines	8.9	5.2	15	-	13
Colombia	9.8	8.8	15	13	15
Brazil	11.3	15.5	24	-	30
Mexico	8.2	9.2	15	9	28

Source: UNDP (2000 cited in Wilshusen et al, 2003: 6)

At finer scales, whilst many people live in urban areas, poverty remains generally higher in rural areas, with the most acute poverty often being found in remote or inaccessible areas of low population densities where biodiversity is most intact (Bain et al, 2014; Dercon, 2009; Meilby et al, 2014; Ravallion et al, 2007; Roe et al, 2010). Whichever way poverty and biodiversity are measured, it is clear that those practising biodiversity conservation and poverty alleviation will often find themselves side by side in the same places (Roe et al, 2010).

It is also important to note that some of the world's poorest countries now have a significant proportion of their territories designated as protected areas (Table 3.13) (Chape et al, 2005; Galli et al, 2014; Scherl et al, 2004). As international concern over poverty continues to grow, such protected areas certainly need to play an important role towards poverty reduction.

Table 3.13: Extent of protected areas in some of the world's poorest countries

Country	Percentage area protected
Tanzania	39.8
DR Congo	8.3
Burundi	5.3
Congo Republic	17.9
Zambia	41.5
Malawi	16.4
Ethiopia	16.5
Zimbabwe	12.7

Source: Chape et al (2003 cited in Scherl et al (2004: 2)

3.8.2.3 Poor people and biodiversity loss

According to Roe and Elliot (2005), the dependency of the poor on biodiversity provides a strong theoretical incentive for them to conserve biodiversity. They cite indigenous knowledge systems within most traditional societies as a demonstration of successful local conservation initiatives. However, it is now a political ecological reality that such initiatives by the poor are fast disappearing in the wake of globalisation, inappropriate policies and other threats (Cox, 2014; Roe and Elliot, 2005). The ensuing insecurity of access and tenure rights over biodiversity has forced many poor people to overexploit limited natural resources as they struggle to meet immediate survival needs (Adams et al, 2004; Nadkarni, 2000; Roe and Elliot, 2005). Additionally, poor people are usually forced onto marginal and degraded lands where even low levels of exploitation can lead to irreversible biophysical damage (Roe and Elliot, 2005). The Brundtland Report of 1987, *Our Common Future*, also cited poverty as a key driver of biodiversity loss by arguing that poor countries and poor people degrade their environment through overuse of natural resources (Brundtland, 1987; Holden et al, 2014). This occurs because there would be no alternative livelihood options.

It would, however, be naïve to interpret the biodiversity-poverty relationships in terms of a simplistic 'vicious circle' (poverty-environmental degradation-more poverty) (Fisher and Christopher, 2007; Gurney et al, 2014; Nadkarni, 2000). Nadkarni (2000) further argues that it would be more realistic and reasonable to treat the vicious circle as one of several prevailing interactions. Poverty should be viewed as only one of a number of factors such as inequality, population pressure, international investment models and trade regimes, and inadequate policies and institutions contributing to biodiversity loss (Nadkarni, 2000; Pinho et al, 2014; Redford et al, 2008; Roe and Elliot, 2005; Turpie, 2009). What eventually

emerges is that poor people conserve or overexploit biodiversity depending on specific contexts and circumstances which are usually external and beyond their control (Roe and Elliot, 2005). Under such circumstances, generalisations are certainly impossible.

There is also considerable debate concerning the role of the rich in fuelling biodiversity loss. For example (as shown earlier), resources of higher commercial value tend to attract the attention of the more affluent groups, often crowding out the poor and marginalised (Vira and Kontoleon, 2010). On the other hand, due to higher levels of consumption, rich countries drive the demand for resources from poor countries leading to overexploitation (Roe and Elliot, 2005).

While the poor directly cause biodiversity loss as they struggle for survival, the underlying or ultimate cause is their marginalisation from the mainstream economy which is usually in the hands of the rich few. The poor are therefore victims of circumstances they are drawn into and which are often beyond their control. This goes to show that the link between poverty and biodiversity loss cannot be viewed as a simple causal relationship.

3.8.2.4 Biodiversity conservation activities impacts on the poor

Parks and protected areas are historically implicated for the poverty and underdevelopment that surrounds them (Ferraro et al, 2011; Roe and Elliot, 2005; Turner et al, 2012). This issue is widely recognised and the 2004 Conference of the Parties of the CBD called for an assessment of the economic and socio-cultural costs arising from protected areas (CBD COP7, 2004). Protected areas, in many cases, have resulted in loss of, or reduced access to, land and resources; forced resettlement; destruction of crops, livestock and homesteads by wild animals; loss of life; fines; among other inconveniences which limit poor people's options and ability to rise out of poverty (Bennett and Dearden, 2014; Brockington and Igoe, 2006; Clements et al, 2014; Ferraro et al, 2011; Igoe, 2006; Liu et al, 2011; Miller et al, 2011; Roe and Elliot, 2005; Turner et al, 2012; Walpole and Wilder, 2008). This is because officially gazetted protected areas are usually managed and enforced in military style with traditional practices of local communities (who would have been evicted to make way for the protected areas) such as hunting and other resource use activities being criminalised (Igoe, 2006; Roe and Elliot, 2005).

Not all protected areas, however, hurt the poor, but all depends on the conservation approaches in use. Some protected areas have indeed generated significant revenues from

tourism with some of this revenue being shared directly with local communities (Roe and Elliot, 2005). Other protected areas have stimulated the development of small local enterprises for tourists thereby providing alternative income sources, while in yet other circumstances, local communities and protected areas have agreed on co-management arrangements (Ameha et al, 2014; Cronkleton et al, 2012; Fischer et al, 2014; Ming'atea et al, 2014; Roe and Elliot, 2005). As shown earlier, protected areas may also include community-conserved areas or indigenous territories providing ecological, cultural and spiritual benefits to local people, and it is therefore a common misconception that a protected area is usually separated from people (Cox et al, 2014; Rawlins and Westby, 2013; Roe and Elliot, 2005). What eventually emerges is that protected areas are established within different contexts and therefore their links and interactions with the poor local people also vary markedly (Roe and Elliot, 2005).

3.8.2.5 Poor people and the potential to undermine biodiversity conservation

One of the main reasons why conservation organisations have been called upon to pay attention to poverty is that poor people can undermine conservation (Fisher and Christopher, 2007; Roe and Elliot, 2005). The argument here, as stated by Adams et al (2004), is that poverty limits conservation success to a sufficient degree that biodiversity conservation will fail if it does not successfully address poverty alleviation. Such a position might be expected in a scenario where poor people were overharvesting wild species, poaching critical species or colonising and cultivating biodiverse land and where the political and economic costs of stopping them were prohibitive (Adams et al, 2004). Poverty reduction under such circumstances would be undertaken by conservation organisations as a means to achieve more effective conservation (Adams et al, 2004; Buta et al, 2014; Fisher and Christopher, 2007; Gurney et al, 2014; Pinho et al, 2014). Examples of policy action would include park outreach (including service provision to neighbouring villages, employment for local people, and local participation in park planning processes), income generating projects (such as sharing revenue from wildlife tourism in protected areas), ICDPs, or the provision of locally acceptable alternatives to lost resources (Adams et al, 2004).

There is debate, however, on whether conservation will fail if it does not take into consideration local needs or would succeed if it did (Roe and Elliot, 2005). For example, using Mkomazi Game Reserve in Tanzania as a case study, Brockington (2003) argues that it is possible to succeed in conservation without incorporating local livelihoods needs.

Additionally, critics of community-based conservation argued that involving local people diverts attention away from conservation objectives (Roe and Elliot, 2005; Terborgh, 1999).

More recently, the argument for involving the local poor in conservation has shifted from a needs-based to a rights-based approach (Kashwan, 2013; Ratner et al, 2014; Roe and Elliot, 2005). In its application to natural resource management, a human-rights-based framework draws attention to the institutions and power structures that determine resource allocation and access, as essential contributions to livelihoods and well-being, sometimes framed as environmental entitlements (Ratner et al, 2014). A number of emerging challenges to the interest of forest-dependent groups have prompted scholars to advocate increased attention to rights-based approaches in forest conservation, while some prominent international conservation groups have issued significant policy statements supporting the rights of forest peoples (Kashwan, 2013). The rights-based perspective argues that, while it might not be necessary or possible to simultaneously pursue conservation and local livelihoods needs, respecting locals' rights to land, resources, and cultural identity is a non-negotiable starting point for any activities that affect them, conservation included (Kashwan, 2013; Ratner et al, 2014; Roe and Elliot, 2005).

3.8.2.6 Poverty reduction activities and biodiversity loss

There is a growing concern at the impact that current models of economic development aimed at poverty reduction have on biodiversity (Roe and Elliot, 2005; Sanderson and Redford, 2003; Walpole and Wilder, 2008). Walpole and Wilder (2008) argue that an overtly economic-oriented development policy fuels environmental degradation and biodiversity loss. This is the argument that environmentalists and conservationists have levelled at the development lobby for decades and is the greatest fear of those who see environmental concerns being marginalised in the rush to meet the relatively short-term targets of the MDGs (Agol et al, 2014; Walpole and Wilder, 2008).

The focus of rural development strategies for the last 50 years, agriculture, has for example, increasingly expanded into previously uncultivated areas leading to biodiversity loss (Gardner et al, 2009; Laurance et al, 2014; Morris, 2010; Roe and Elliot, 2005). In addition, infrastructural development, while vital for economic development, has also had its toll on biodiversity (Laurance et al, 2014; Morris, 2010; Roe and Elliot, 2005). For example, while road construction enhances access to markets, schools, and hospitals for the poor, it also leads

to massive habitat fragmentation and biodiversity loss (Roe and Elliot, 2005; Walpole and Wilder, 2008). Developing countries such as China, Indonesia and Brazil have greatly reduced rural poverty at the expense of their natural capital (Leisher et al, 2010). The relationship between economic development and environmental quality can be described by the Environmental Kuznets Curve which shows that environmental quality declines as income rises until income reaches a certain level where biodiversity will then recover (Roe and Elliot, 2005). However, Roe and Elliot (2005) further argue that the extent to which this applies to biodiversity and development is unclear, as rich countries generally have low biodiversity while on the other hand poor and developing countries are highly biodiverse. At some point, the biodiversity in the rich countries should have regenerated as excessive, and often destructive, natural resource-use and dependence slowed down.

On the other hand, Walpole and Wilder (2008) argue that reducing poverty will certainly reduce pressure on biodiversity by eradicating the need for unsustainable use. They further argue that provision of opportunities for alternative livelihoods will place people in a position to choose to conserve. This is the same argument behind ICDPs, and has resulted in some conservationists becoming actively involved in more immediate livelihoods-focused initiatives (Bauch et al, 2014; García-Amado et al, 2013; Walpole and Wilder, 2008).

Others, however, argue that, just as it is not clear that poor people degrade their environment because they are poor, there is little evidence to suggest that increasing incomes affects the way in which poor people exploit natural resources (Adams et al, 2004; Nadkarni, 2000; Roe and Elliot, 2005; Walpole and Wilder, 2008). There seems to be other issues of greater significance such as governance, security of tenure, and access to resources influencing the way in which poor people overexploit now or conserve for the future (Roe and Elliot, 2005).

3.8.2.7 Can biodiversity reduce poverty?

The fact that biodiversity supports poor people is not in question, and it has been shown earlier that biodiversity provides a ‘safety net’ for meeting the basic needs of the poor lacking cash or other marketable assets (Adams et al, 2004; Roe and Elliot, 2005; Vira and Kontoleon, 2010). The question, however, is on whether biodiversity can actually lift the poor out of poverty (Roe, 2008; Roe and Elliot, 2005).

It has been documented that wildlife-based poverty reduction interventions are only likely to be of significant impact for certain groups of poor people, especially forest dwellers, those

adjacent to protected areas, those in wildlife-rich areas of low agricultural potential, and those in locations of high tourism potential (Roe and Elliot, 2005; DFID, 2002). On the other hand, the WRI (2005) records that income from biodiversity can be immensely significant for the economic empowerment of the rural poor, with biodiversity stimulating small enterprises among other income generating activities. Other factors such as lack of energy and unavailability of markets have limited the poor to the exploitation of low value biological resources (Roe and Elliot, 2005; Vira and Kontoleon, 2010). As has been shown earlier, high value resources tend to be appropriated by more powerful, and well-connected interests. This in turn further reduces the potential of biodiversity in lifting poor people out of poverty.

Ambiguity on the role of biodiversity in poverty reduction can also be evidenced in the shifting agendas of international development agencies (Roe and Elliot, 2005). Biodiversity was, until recently, part of the core programme of activities of donor agencies pursuing the goal of sustainable development (Roe and Elliot, 2005; Sanderson and Redford, 2003; Walpole and Wilder, 2008). The late 1990s witnessed a refocusing of development discourse on poverty reduction with biodiversity conservation falling off the development agenda since then (Roe, 2008; Roe and Elliot, 2005; Sanderson and Redford, 2003; Walpole and Wilder, 2008). This is because biodiversity is not viewed as being directly relevant to poverty reduction, is too long-term, is too uncertain in its outcomes and their distribution among the poor and, moreover, is not amenable to significant upstream policy leverage (Roe and Elliot, 2005). The developmentalists behind this idea further argue that the refocus on poverty alleviation without biodiversity conservation does not, however, mean an outright abandonment of conservation, as poverty alleviation will itself achieve many conservation goals (Sanderson and Redford, 2003). Such a perspective, however, mirrors an earlier flawed argument that poverty alleviation will produce conservation (Sanderson and Redford, 2003; Walpole and Wilder, 2008).

The MDGs, currently providing the guiding framework for international development, recognise that biodiversity can play a critical role towards achieving the MDGs, particularly those on hunger, health and environmental sustainability (Roe and Elliot, 2005; Sachs et al, 2009). What is, however, disturbing is the fact that environment has been separated into one of the eight MDGs rather than being integrated across all the goals (Roe and Elliot, 2005). This would help in clearly articulating the relevance of the environment, and more particularly biodiversity, in meeting those poverty reduction goals (Roe and Elliot, 2005).

The debate on the relevance of biodiversity to poverty reduction is also related to the uncertainty in the relationship between biodiversity and ecosystem services (Pinho et al, 2014; Roe and Elliot, 2005). While the MEA notes that ecosystem services are pivotal in reducing poverty, there is a dearth of clarity on specifically how much, and what kind, of biodiversity is required to generate these services (Pinho et al, 2014; Roe and Elliot, 2005).

From the foregoing, it has been clearly shown that the linkages between biodiversity and poverty are not as obvious as many people might think. These are indeed diverse and contested and should not be viewed as simple, linear or causal relationships. The implications from this is that interested parties such as conservation organisations should be cautious and context specific when dealing with biodiversity-poverty issues, avoiding rushed overgeneralisations. The next section now looks at poverty reduction approaches in protected areas.

3.9 Poverty reduction mechanisms in protected areas: the benefits from conservation

The previous section has shown that the link between biodiversity and poverty is not just a causal and simplistic one, but is governed by a complex web of factors. It is, however, clear that the rural poor are highly dependent on the goods and services provided by biological diversity, and that such high dependency has often resulted in overexploitation and unsustainable use. As shown earlier, there is debate, however, as to whether reduction in rural poverty could break the destructive resource use patterns of the poor. This is because, as previously indicated, natural resource consumption at times tends to increase with income and therefore reducing rural poverty will not automatically guarantee biodiversity safety but may actually exacerbate overexploitation. There are good reasons though, why reducing local poverty in conservation areas is important (Leisher et al, 2010). Ethically, a conservation initiative should help people and not hurt them, while practically, a conservation initiative needs to provide tangible and lasting benefits to local people or the initiative will not be socially sustainable (Gurney et al, 2014; Leisher et al, 2010; Rastogi et al, 2010; Scherl et al, 2004).

There are several conservation mechanisms, interventions or strategies that can contribute measurably to reducing poverty while simultaneously conserving biodiversity. Sometimes these mechanisms are a route out of poverty for the local people, sometimes they provide modest poverty reduction benefits or a safety net to keep people from falling deeper into

poverty, while at times a few mechanisms can actually become poverty traps that perpetuate rural poverty (Ferraro et al, 2011; Leisher et al, 2010; Roe, 2008). Such conservation areas could be state owned, privately owned, community owned or collaboratively or inclusively owned by various stakeholders. This section reviews some of the conservation mechanisms and how they work in poverty reduction and the uncertainties or challenges inherent in them.

3.9.1 Protected area outreach

Even where fully protected areas such as national parks are well established and resource extraction is prohibited, outreach programmes are needed to offer tangible benefits and compensation to whosoever is negatively affected (Borgerhoff Mulder and Coppolillo, 2005; Gurney et al, 2014; Pinho et al, 2014; Romero et al, 2012; Scherl et al, 2004; Turner et al, 2012; Walpole and Wilder, 2008). Outreach activities are very broad, and appropriate outreach activity is therefore context-specific (Borgerhoff Mulder and Coppolillo, 2005). One of the most popular outreach activities among conservation areas is that of benefit-sharing which entails the provision of development-oriented services such as schools, health, roads, and water services (Borgerhoff Mulder and Coppolillo, 2005). While such projects can be quite impressive, decades of rural development effort have shown that small-scale interventions are only useful if followed up with operational expenses such as road rehabilitation, supplies of pharmaceutical and school materials, teachers and health workers' salaries, and technical training (Borgerhoff Mulder and Coppolillo, 2005). An example of the importance of follow-ups in benefit sharing is provided by Western (1994) where piped water was provided to the Maasai as compensation for the loss of access to Ol Tukai swamps, their long-term traditional source of water. Lack of training in pump maintenance and unavailability of long-term supplies of diesel resulted in the collapse of the benefit-sharing programme (Borgerhoff Mulder and Coppolillo, 2005; Western, 1994).

Benefit-sharing programmes can also be difficult to implement, simply because they are small and not necessarily consistent with broader regional development policy (Agrawal and Redford, 2006; Bauch et al, 2014; Blom et al, 2010; Borgerhoff Mulder and Coppolillo, 2005; Scherl et al, 2004). There is also the problem of the buying off of communities involving most benefit-sharing schemes with conservation organisations using benefit-sharing merely as an opportunity for garnering local support (Borgerhoff Mulder and Coppolillo, 2005). The success of benefit-sharing as an outreach strategy therefore heavily

depends on follow-ups and also the need to take into serious consideration the broader socio-economic and political context within which such strategies are being carried out.

While there are multiple benefits provided by protected areas, only one direct benefit, employment creation, can show empirical evidence of having reduced poverty (Bayliss et al, 2014; Leisher et al, 2010; Liu et al, 2014). The establishment of a protected area often involves the hiring of local people as aids in operating it (Leisher et al, 2010; Liu et al, 2014). In a study carried out by WWF on 200 protected areas selected from 37 countries across the world, the revelation was that, on average, a protected area employed about 40 permanent staff (Leisher et al, 2010; WWF, 2004). Urban-Econ also revealed that in 2006, the 21 national parks in South Africa employed 3 776 people with a payroll of US$37.5 million (Leisher et al, 2010; Urban-Econ, 2008). The average wage for a South African park employee was also shown to be two times greater than the average wage in the forestry sector (Leisher et al, 2010). While the number of jobs offered by a protected area may be few, and the salaries offered modest, such jobs may have a significant multiplier effects in the rural economy as a whole (Leisher et al, 2010).

There are, however, some issues in protected area employment that require close attention. First, those hired by protected areas tend to be the moderately poor to better off, while the poorest of the poor rarely have the basic skills or the connections needed to secure a job in a protected area (Borgerhoff Mulder and Coppolillo, 2005; Leisher et al, 2010). Second, many of the jobs created by protected areas often do not go to the local people (Borgerhoff Mulder and Coppolillo, 2005; Leisher et al, 2010). Locals are usually employed in positions requiring knowledge of the local area, such as guides and guards, and these often pay too little to lift a poor local person out of poverty (Leisher et al, 2010), which makes locals feel marginalised and disempowered (Borgerhoff Mulder and Coppolillo, 2005). Third, while the establishment of a protected area may create jobs for some local people, others are negatively impacted upon, through restriction of access to natural resources and through involuntary resettling (Brockington et al, 2006; Leisher et al, 2010).

3.9.2 Timber

Approximately 25% of forests in developing countries were owned by communities in 2004 (Leisher et al, 2010; Scherl et al, 2004). Factors including a growing demand for forest products, market deregulation, retreat of forest concessionaires, decentralisation coupled with

democratisation and anti-corruption, and new technologies that make small-scale harvesting and processing easier, are working in favour of community forests (Leisher et al, 2010; Sunderlin et al, 2007). The most common community forestry mechanism is small-scale wood processing and this has benefited the rural poor immensely (Leisher et al, 2010). There are often some contracts between communities and companies for the supply of fibre, pulp or construction timber with the income generated helping in reducing poverty, while sustainable timber harvesting simultaneously helps in biodiversity conservation (Leisher et al, 2010).

There is considerable evidence proving that community forestry timber enterprises can reduce poverty and conserve biodiversity (Leisher et al, 2010). For example, a study of 14 community forestry timber enterprises in selected developing countries revealed high profitability (Leisher et al, 2010; Molnar et al, 2007). In Mexico, community forestry enterprises have been shown to have significantly reduced poverty (Bray and Tardanico, 2005; Leisher et al, 2010). Sunderlin et al (2007) have remarked that community forestry can be an important tool for lifting people out of poverty in forested areas, especially if it is accompanied by tenure transfer to communities and improved marketing opportunities for the timber. Empirical evidence in several countries has also proven community forestry to having led to increased forest cover (Leisher et al, 2010). This shows that community forestry can contribute to rural poverty reduction while simultaneously promoting biodiversity conserving.

While community forestry can contribute to poverty reduction, this, however, is not always the case (Leisher et al, 2010). The sharing of returns from community-based resource management projects has always posed a challenge (Roe and Elliot, 2005; Leisher et al, 2010). To corroborate the above, a study of small and medium-sized timber enterprises found that, on average, 75% of enterprises fail in the first three years of operation (Leisher et al, 2010; Mayers, 2006). Sunderlin et al (2005) identify four main challenges to the role of community-forestry as a way out of poverty for the poor. First, timber represents a long-term investment while low-income people usually require a short-term income. Second, there seems to be little trickle-down benefit from timber harvesting to the local community. Third, timber requires secure land tenure and the poor are often landless or have informal control over land and (Awono et al, 2014; Bremer et al, 2014), fourth, depending on forestry resources can be a poverty trap when access to markets is very limited. Indeed, Chomitz et al

(2007) have shown a strong positive correlation between poverty and the number of hours to the nearest major timber market.

In spite of the above challenges, timber from community forests can be a way out of poverty. There is need for tenure transfer, market accessibility, and the setting up of robust and transparent benefit-sharing arrangements in the communities to enhance success.

3.9.3 Non-timber forest products (NTFPs)

There is growing evidence that NTFPs contribute significantly to maintain livelihoods in rural areas particularly in developing countries (Heubach et al, 2011; Kar and Jacobson, 2012; Saha and Sundriyal, 2012; Shackleton and Pandey, 2014). A 2000 report by WHO showed that 80% of the population inhabiting the developing world utilise wild products to meet some of their needs (Mujawamariya and Karimov, 2014). NTFPs embody all biological matter of wild plants and animals other than timber extracted from forests and woodlands such as fruits, nuts, vegetables, game, medicinal plants, resins, bark, fibres, palms, grasses as well as small wood products and firewood, amongst others (Adam et al, 2013; Belcher, 2003; Heubach et al, 2011; Shackleton and Pandey, 2014). NTFPs have three main functions in the household economy of rural communities living in or adjacent to forests (Heubach et al, 2011; Shackleton and Pandey, 2014). Firstly, they help to fulfil households' subsistence and consumption needs in terms of energy, nutrition as well as medical and construction purposes; secondly, NTFPs provide a safety-net, or insurance, for use in times of misfortune, such as death of a breadwinner in the household, loss of crops or livestock due to drought, disease or flooding, unexpected financial commitments or retrenchment and; thirdly, NTFPs provide many households with a means of income generation, either as supplementary income to other livelihood activities, or as the primary means of cash generation (Shackleton and Pandey, 2014).

The benefits that local people get through NTFPs will in turn work as an incentive for them to protect the natural forests which in turn benefits biodiversity (Delang, 2006; Leisher et al, 2010). According to Delang (2006), the fundamental idea behind the advantages of the trade of NTFPs for both poverty alleviation and biodiversity conservation is simple: the forests are home to poor people who have an incentive in cutting them. Delang (2006) further argues that, if they could earn higher incomes from the sale of NTFPs than from the sale of timber or from alternative uses of the forest, then the poor would tend to conserve it. Thus, trade in

NTFPs has the potential to reduce poverty while simultaneously promoting the conservation of the forests (Delang, 2006; Saha and Sundriyal, 2012; Shackleton and Pandey, 2014).

Empirical evidence shows that the poorest of the poor are the ones who most often use NTFPs and also that NTFPs can prevent a decline further into poverty, though NTFPs are also shown to rarely sustainably reduce local poverty (Adam et al, 2013; Delang, 2006; Leisher et al, 2010; Mujawamariya and Karimov, 2014). A study by Marshall et al (2006) of 16 NTFP value chains in Bolivia and Mexico revealed that these can be one of the few income generating opportunities for women in marginalised rural communities, particularly female-headed households. Belcher et al (2005) studied 61 cases of NTFP production and trade in Africa, Asia and Latin America and found them not to have significantly reduced poverty in most cases. Four major reasons why this is usually the case have been identified: first, NTFPs are often an open access resource thus leading to their overexploitation; second, access to NTFP markets tends to be poor for many forest dwellers; third, fluctuations in the quality and quantity of NTFPs have made them an unreliable income source and; fourth, middlemen have often enjoyed the added value of NTFPs (Mujawamariya and Karimov, 2014; Muler et al, 2014; Pandey et al, 2007). External powers often take control of NTFPs once they see that they can make money out of them leaving the needy poorest of the poor with nothing (Leisher et al, 2010). For example, poor people have often been reduced to collectors of NTFPs in Indonesia for some powerful people while they get very little out of it (Leisher et al, 2010).

As a way of ensuring that the poorest of the poor benefit from NTFPs Leisher et al (2010: 31-32) have suggested the following six recommendations:

- Producers must have secure tenure rights
- Producers combine NTFP production with other rewarding economic activities
- Products may be harvested efficiently from areas where abundance of NTFP-producing species has increased as a result of tending, enhancement planting, and domestication
- Products have established markets or potential to reach promising niche markets
- Producers have the capacity to add value to the products
- Producers are organised and maintain effective alliances with outsiders who may help identify new markets and potential donors

3.9.4 Ecotourism

The term ecotourism emerged in the late 1980s as a direct result of the world's acknowledgment of sustainable and global ecological practices (Coria and Calfucura, 2012) and is potentially the most straightforward and least intrusive way of deriving social and economic benefits from protectionism, and can be a very lucrative enterprise for wildlife-rich areas (Agrawal and Redford, 2006; Borgerhoff Mulder and Coppolillo, 2005). Despite the lack of a universal definition of ecotourism, common elements are still discernible in various definitions (Agrawal and Redford, 2006; Janusz and Bajdor, 2013). Ecotourism is loosely defined as nature-based travel (Leisher et al, 2010). According to Blangy and Wood (1993: 32), ecotourism is "responsible travel to natural areas that conserves the environment and sustains the well-being of local people". Agrawal and Redford (2006: 20) define ecotourism as "travel that generates financial support for protection and management of natural areas, economic benefits for residents living near natural areas, and support for conservation among these residents". The International Ecotourism Society notes that "the essence of responsible travel is to take care of the environment and the desire to balance the life of the local community" (Janusz and Bajdor, 2013: 524). Ecotourism's different definitions, including many not described here, all allude to the idea that it should generate low visitor impact and help conserve biodiversity, and should generate beneficial socio-economic outcomes for local populations to help reduce poverty (Agrawal and Redford, 2006; Janusz and Bajdor, 2013).

The key elements of ecotourism, according to Borgerhoff Mulder and Coppolillo (2005), are that ecotouristic enterprises contribute revenue directly to conservation in the destination area, provide funds and motivation for the restoration and monitoring of natural areas, and nurture an appreciation of the natural world in the visitor and host community. There is a lot of emphasis on local management, on minimising the physical impacts of tourism and on education (Borgerhoff Mulder and Coppolillo, 2005). Local communities view ecotourism positively because of the potential it brings for their participation in the economic growth of their area (Bayliss et al, 2014; Borgerhoff Mulder and Coppolillo, 2005). The effectiveness of nature-based tourism in providing incentives for sustainable ecosystem management often depends inter alia on sufficient returns to neighbouring communities through profit-sharing mechanisms (Bayliss et al, 2014; Liu et al, 2014). For conservation organisations, an alliance with the tourism industry offers a possibility of the much sought after win-win scenario in which nature and local communities all thrive (Borgerhoff Mulder and Coppolillo, 2005).

Ecotourism includes community-based operations on one end and all-inclusive international eco-lodges and safari operators on the other (Leisher et al, 2010).

Ecotourism can contribute to poverty reduction for locals through provision of jobs mainly in accommodation and guiding (Borgerhoff Mulder and Coppolillo, 2005; Chiu et al, 2014; Leisher et al, 2010; Liu et al, 2014). The poverty reduction role of ecotourism can greatly be enhanced where the tourism operators hire and train local people (Bayliss et al, 2014; Leisher et al, 2010). For example, local tourism operators at Bunaken National Park in Indonesia reserved 80% of the jobs for local communities which resulted in about 1 000 new jobs in tourism every five years (Leisher et al, 2010). Employment creation from nature-based tourism is further enhanced by the service nature of the tourism industry where a high proportion of the jobs involve low-skill jobs which can competently be done by often lowly educated people from the local communities (Leisher et al, 2010; Liu et al, 2014). Ecotourism also brings with it indirect benefits to locals, often in remote areas, in the form of roads, communication infrastructure, clinics, schools and shopping facilities established primarily for supporting tourism (Agrawal and Redford, 2006; Leisher et al, 2010). There is also the multiplier effects whereby tourism creates opportunities and downstream effects for other people besides the wage earners through the opening up of new markets for local services and products including sales of crafts, cultural services and small enterprises (Borgerhoff Mulder and Coppolillo, 2005; Leisher et al, 2010). A World Bank study on global tourism found out that the typical tourism multiplier is between 2 and 3 meaning that each dollar spent by a tourist generates 2 or 3 more dollars in the national economy (Leisher et al, 2010).

There are, however, several uncertainties about ecotourism as a poverty-conservation mechanism (Leisher et al, 2010). First, tourism is too sensitive to elements such as terrorism attack, economic decline, civil war or disease outbreak which all can result in a sudden drop in tourist arrivals (Borgerhoff Mulder and Coppolillo, 2005; Leisher et al, 2010). Several decades of successful conservation can suddenly disappear as tourism-dependent local people are forced to unsustainably exploit tourist-attracting natural resources like wildlife for immediate livelihood needs (Leisher et al, 2010; Youdelis, 2013). Second, there can be ‘leakage’ when skilled staff and luxury items are imported for a tourism operation while profits are exported, leaving only a few poverty-reducing benefits to locals from tourism (Leisher et al, 2010). Third, the seasonality of tourism comes with an uneven, unstable and therefore unreliable income stream (Jalani, 2012; Leisher et al, 2010). Finally, if not properly

planned, and managed, tourism can bring with it serious ecological impacts thereby eventually jeopardising itself and biodiversity (Coria and Calfucura, 2012; Jalani, 2012; Janusza and Bajdor, 2013; Leisher et al, 2010). Several socio-cultural negative impacts of tourism have also been documented (Borgerhoff Mulder and Coppolillo, 2005; Jalani, 2012).

A review of 27 tourism case studies in Asia revealed that, while there were income gains for all income levels, those already better off gained most (Leisher et al, 2010). Similar results were found in a World Bank Study in Zambia where nature-based tourism had reduced poverty but the less poor benefited more than the very poor by up to 50% (Leisher et al, 2010; World Bank, 2007b).

In spite of the above and other challenges and uncertainties, nature-based tourism remains a significant and relatively effective poverty-conservation mechanism. This can be evidenced by its continued growth and popularity throughout the world.

3.9.5 Payments for environmental services (PES) and REDD+

Recent years have seen considerable interest in using PES to finance conservation (Ingram et al, 2014; Kroeger, 2013; Pagiola et al, 2005; Rodriguez-de-Franisco and Budds, 2014). The rapid shrinking of natural habitats is threatening nature's ability to continue providing free environmental services and this scarcity of environmental services has made them potentially subject to trade (Escobar et al, 2013; Schomers and Matzdorf, 2013; Wunder, 2005). The rationale behind PES is that external environmental services beneficiaries make direct contractual and conditional payments to local landholders and users in return for adopting practices that secure ecosystem conservation and restoration (Escobar et al, 2013; Kroeger, 2013; Wunder, 2005).

Wunder (2005: 3) defines PES as "a voluntary transaction where a well-defined environmental service (or a land use likely to secure that service), is being 'bought' by a (minimum one) environmental service buyer, from a (minimum one) environmental service provider if and only if the environmental service provider secures environmental service provision (conditionality)". From this definition, it is clear that PES is a voluntary and negotiated framework, with potential environmental service providers having real land use choices completely free from command-and-control influences (Derissen and Latacz-Lohmann, 2013; Kroeger, 2013; Rodriguez-de-Franisco and Budds, 2014; Wunder, 2008). In addition, what is bought or to be bought (environmental service), must be clearly defined and

be directly measurable (for example, provision of clean water from conservation) (Wunder, 2008).

To date, the evidence of PES benefiting the poor is in payments for watershed services and in carbon sequestration and storage (Ingram et al, 2014; Leisher et al, 2010; Mombo et al, 2014; Wunder, 2005). In the payments for watershed services mechanism, downstream water users pay upstream land users such as farmers for adopting land uses that limit deforestation, soil erosion and flooding risks (Leisher et al, 2010; Wunder, 2005; Wunder, 2008). It has been found that it is often cheaper for downstream users such as cities to protect their upstream water sources than increase water treatment costs (Dudley and Hamilton, 2010; Leisher et al, 2010). In carbon sequestration, CO^2 emitters pay landholders to reforest an area thereby offsetting their CO^2 emissions, while in carbon storage, CO^2 emitters pay landowners for them not to deforest or degrade an area thereby keeping the forest intact (Leisher et al, 2010). An example of a carbon sequestration and storage PES would be where conservation donors would pay local people for setting aside or naturally restoring areas to create a biological corridor, or a tourist operator paying a local community not to hunt in a forest being used for wildlife viewing (Wunder, 2005).

While PES has been shown to have reduced poverty, others view the cash payments from the mechanism as being relatively insignificant, functioning more like a bonus rather than a real incentive for land use change (Leisher et al, 2010; Wunder, 2005; Wunder, 2008). Several factors seem to limit the effectiveness of PES in reducing poverty among the poor. First, PES as a conservation-poverty mechanism is closely linked to land ownership and, as such, the poorest of the poor rarely benefit from a PES because most of them do not own or control land (Bremer et al, 2014; Leisher et al, 2010; Wunder, 2005). From the above definition of PES, under these conditions, therefore, the poor are not in a position to ensure the delivery of an agreed upon environmental service. Rather, it is the moderately poor smallholders and the better-off landowners who are better placed to benefit from PES (Bremer et al, 2014; Leisher et al, 2010). Leisher et al (2010) note that the inclusion of the poor in PES is more often by accident than design as most PES initiatives are usually not aimed at poverty reduction.

Second, there are high transaction costs where there are a large number of landholders, which negatively impacts on the poorest of the poor attempting to pool together fragmented holdings (Leisher et al, 2010). Third, only those who pose a real and credible threat to an environmental service are likely to be paid for it (Bremer et al, 2014; Leisher et al, 2010;

Wunder, 2005). It follows logically therefore that since the poorest of the poor are usually, though arguably, not a major threat to an environmental service as they often do not own land, they are automatically crowded out from benefiting from PES. Leisher et al (2010) have also registered a concern over the elusiveness surrounding the confirmation or evidence that an environmental service has actually been delivered. Further highlighting the challenges surrounding benefits from PES initiatives, Lele et al (2010) note that buyers of environmental services do not usually come from individual buyers but may also come from the state or international donors thereby making these transactions not quite market-based.

Experience with PES has also led to the emergence of the Reducing Emissions from Deforestation and Degradation (REDD) concept, a slightly different form of PES (Blom et al, 2010). With tropical deforestation accounting for up to a fifth of global anthropogenic carbon dioxide emissions, REDD has been positioned as a potentially cost-effective climate change mitigation strategy by the UN Framework Convention on Climate Change (UNFCCC) (Delacote et al, 2014; Pandey et al, 2014). Whereas PES are voluntary transactions wherein environmental service buyers compensate environmental service providers, with services including watershed protection, carbon sequestration, and biodiversity conservation, in the case of REDD, the environmental service is reduced emissions from forests (Blom et al, 2010; Wunder, 2005). Another fundamental difference between PES and REDD is that while the PES payment system is based on the actual provision or delivery of an environmental service, REDD includes official development assistance that will not be conditional on the provision of the service, in this case carbon emissions reduction (Blom et al, 2010).

While REDD is primarily intended to prevent forest loss by reducing emissions through land use change, the UNFCCC has incorporated safeguards to ensure that communities are not negatively affected and can benefit from REDD measures (Leventon et al, 2014). These safeguards, popularly known as REDD+, include requirements for the full participation of relevant stakeholders, including communities, and for measures to incentivise protection and conservation while enhancing social and environmental benefits (Leventon et al, 2014). However, these social objectives could be threatened if certain conditions are not fulfilled in the design or implementation of REDD+ projects including land tenure reform, which is perceived as a precondition for payment, community member participation, benefit-sharing arrangements, equity and decentralisation in forest resource management

(Awono et al, 2014). Others raise concerns that there might be a return to centralised forest management (Leventon et al, 2014).

PES are still embryonic and experiments with them to local people for conservation only began post-2000 mostly in Costa Rica and other parts of Latin America (Lele et al, 2010; Mombo et al, 2014; Wunder, 2005). The limited information currently available on PES therefore gives an ambiguous and as yet incomplete picture of them (Lele et al, 2010). However, PES are a potentially effective conservation-poverty mechanism and given more time for experimentation, they are likely to become one of the most popular mechanisms in the near future.

3.9.6 Fish spillover

Historically, the fundamental purpose of marine protected areas (MPAs), no-take or closed zones has been biodiversity conservation (Miller and Russ, 2014; Potts et al, 2014). However, the provision of direct and indirect benefits for society from such sites is increasingly recognised (Potts et al, 2014). The fish spillover mechanism involves the protection of a key marine habitat, allowing fish stocks to replenish after which some of the fish will then spill over into adjacent areas where they can then be fished out (Bennett, and Dearden, 2014; Leisher et al, 2010), thereby spatially restricting impacts from fishing effort and fishing mortality (Miller and Russ, 2014). The logic behind this mechanism is that the 'no-take' or closed zone will allow fish to grow bigger making them capable of producing more offspring compared to smaller fish (Bennett, and Dearden, 2014; Leisher et al, 2010; Miller and Russ, 2014). This can foster population recovery within the protected region, enabling the recovery to expand to nearby areas (Martins et al, 2014; Miller and Russ, 2014). This ultimately provides more fish, more income and a reduction in poverty for catchers, while the no-take zone is also helping protect habitat for marine biodiversity (Bennett, and Dearden, 2014; Leisher et al, 2010; Martins et al, 2014; Rossiter and Levine, 2014).

The fish spillover mechanism works better with active participation of local communities (Hattam et al, 2014; Leisher et al, 2010). The size of the no-take zone is also important in the success of the mechanism and evidence has been recorded that too large no-take zones result in smaller spillover which will not offset the losses to fisherman from the closure of other sections of the fishing grounds (Leisher et al, 2010; Sowmann et al, 2014). For this reason, networks of smaller MPAs are preferable to a few large ones (Leisher et al, 2010).

It has been shown that fish spillover as a poverty-conservation mechanism is very effective as the poorest of the poor can benefit because the barriers to collecting marine resources have been found to be quite low (Leisher et al, 2010; Morzaria-Luna et al, 2014). The poverty reduction benefits of spillover can be significant especially in areas with many poor people where fishing might be in danger of overexploitation (Leisher et al, 2010). Leisher et al (2007) note that fish spillover from two community-managed marine areas in Fiji doubled local incomes within five years of establishing the no-take zone. Other indirect benefits from community-based spillover to the poor including the strengthening of community social fabric by giving communities a more unified voice to solve other community challenges (Bennett, and Dearden, 2014; Leisher et al, 2007). The World Bank identifies strong social cohesion as an important factor towards empowering local decision making, which in turn is a key element in poverty reduction (Leisher et al, 2010).

Uncertainty, however, surrounds the potential of fish spillover towards poverty reduction with skeptics citing exaggerated optimism about its potential (Bennett, and Dearden, 2014; Leisher et al, 2010). For example, some MPAs in Philippines and Indonesia were "biological successes and social failures" through limiting participation, inequitably sharing economic benefits, and lacking in conflict resolution mechanisms; in Honduras they have restricted livelihoods without providing alternatives by limiting access to traditional areas that are now open to tourists; while in India they have exacerbated pre-existing conflicts (Bennett, and Dearden, 2014).

In spite of the above comments by skeptics, the fish spillover conservation-poverty mechanism has great potential. Part of its strength lies in the fact that, unlike most mechanisms discussed above, the poorest of the poor are more able to benefit.

3.9.7 Agroforestry

Widespread concerns over land degradation and lack of effective solutions have led to the hope that international agroforestry research could contribute new solutions (Lasco et al, 2014; Mbow et al, 2014). The mechanism of agroforestry involves the integration of domesticated trees into agricultural landscapes so as to obtain both economic and ecological benefits (Leisher et al, 2010). Agroforestry has been shown to provide a number of benefits to farmers including the enhancement of soil fertility, improvement of farm household resilience through provision of various non-timber tree products or agroforestry tree products

for sale or home consumption such as oils, fruits and medicines (Leisher et al, 2010; Mbow et al, 2014; Rosenstock et al, 2014). In light of recurring food shortages, projected climate change and rising prices of fossil-fuel-based agricultural inputs, agroforestry has recently experienced a surge in interest from the research and development communities as a cost-effective means to enhance food security while at the same time contributing to climate change adaptation and mitigation (Mbow et al, 2014). Agroforestry landscapes are more complex than monoculture systems as they consist of annual and perennial plants often integrated with livestock (Luedeling et al, 2014), which brings with it ecosystem stability and resilience (Leisher et al, 2010). In addition, trees influence the hydrological cycle while biodiversity drives nutrient recycling and water fluxes in agro-ecosystems (Smith and Mbow, 2014).

A growing body of empirical evidence shows that agroforestry is an effective and less technical means of reducing poverty while at the same time helping conserve biodiversity (Leisher et al, 2010). Studies in West Africa revealed that indigenous domesticated fruit trees have improved the livelihoods of poor households, particularly female-headed ones, while studies in India showed agroforestry augmenting income from rice monoculture by 2 to 3 times compared with non-agroforestry households (Leisher et al, 2010). Another strength of agroforestry as a conservation-poverty mechanism lies in the fact that the income it generates is often distributed throughout the year which evens out household income fluctuations (Leisher et al, 2010), and this can be particularly important for poor households.

In spite of the above success stories, the adoption of agroforestry has not been widespread due to a number of reasons related to the performance of agroforestry practices, the political and socio-economic environment or simply farmers' disposition towards trees on their farms (Mbow et al, 2014; Smith and Mbow, 2014). According to Leisher et al (2010), conflicting legal environments governing the use of trees and tree products which undermines potential benefits, especially in sub-Saharan Africa, lack of access to markets for agroforestry products and lack of secure property rights by the poorest of the poor who do not have land on which to grow trees are some of the challenges to the adoption of agroforestry.

Despite the above challenges and uncertainties, agroforestry has immense potential to contribute towards poverty reduction and biodiversity conservation. Its main advantage lies in the fact that it is cheap to implement, with no involvement of specialised skills or high

financial capital and, provided the poorest of the poor have access to land, they can benefit without facing major bottlenecks.

This section has identified some of the various conservation-poverty mechanisms that can be adopted so as to aid in simultaneously addressing conservation and development goals. As has been shown, various benefits can be derived from such mechanisms, which can help reduce poverty especially among the rural poor. Several hindrances and uncertainties inherent in these mechanisms have also been identified which can work against ensuring that the poor benefit. Evaluation studies of over a hundred conservation projects with poverty impacts revealed four largely interrelated hindrances to ensuring that the intended poorest of the poor benefit from the conservation-poverty initiatives (Leisher et al, 2010: 42):

- Better-of households with higher assets and higher levels of social capital were more likely to participate in conservation initiatives
- Not only were elites more likely to participate, but they were often times the main recipients of conservation-induced livelihood benefits
- Conservation projects sometimes led to a widening of income disparities
- There was some evidence that women could have realised greater livelihood gains from projects but were excluded due to discrimination

There is therefore need for a deliberate move by conservation-poverty project developers, in conjunction with policy-makers at national level, to make sure that the poorest of the rural poor, who are the real targets of poverty reduction initiatives, benefit from such initiatives. One chief measure could be, where possible, the securing of tenure rights for the poor as most of the conservation-poverty mechanisms discussed above require households to have secure land tenure for them to effectively benefit (Bremer et al, 2014). Discrimination against female-headed households should also be checked and corrected as this has the potential to drive such households deeper into poverty (Leisher et al, 2010). If appropriate measures are taken, including the few suggested above, the potential for conservation-poverty initiatives in meeting the twin goals of biodiversity conservation and poverty reduction could further be enhanced and realised.

3.10 The challenges of joining conservation and development: two sides of two different coins?

While the ideals of conservation and sustainable development have been promoted by many conservationists, there are immense ecological, social and political challenges facing both arenas which has left some wondering about the practicality of joining such broad policy agendas (Barrett et al, 2011; Brandon, 1998; Gustavsson et al, 2014; Kramer et al, 1997; Mukul et al, 2010; Norton-Treves et al, 2005; Salafsky, 2011; Walpole and Wilder, 2008; Wilshusen et al, 2003). Ideally biodiversity conservation must be integrated with development since nature provides ecosystem services for human well-being (Gustavsson et al, 2014). However, such an integration has been contested since sustainability is a normative, and thus fundamentally contested concept - sustainable for whom and of what? (Cottrell et al, 2013; Gustavsson et al, 2014; Holden et al, 2014). A number of scholars have argued that the sustainable development concept is in danger of becoming irrelevant as it has become so comprehensive, complex and all-inclusive such that it is no longer useful in guiding policy-making (Holden et al, 2014).

Integrated projects often result in conflict and unequal distribution of costs and benefits since trade-offs between societal demands have not been explicitly addressed (Gustavsson et al, 2014). Walpole and Wilder (2008) further note that conservation and poverty are multifaceted concepts and the linkages between them are complex and variable such that whether and how conservation contributes to poverty reduction in practice will depend on the specific nature of those linkages. Experiences from attempts at joining nature protection and sustainable development, which increasingly became common since the 1980s through ICDPs, have revealed some challenges that deserve continued examination in order to further strengthen international biodiversity conservation policy (Fisher et al, 2005; Salafsky, 2011; Wilshusen et al, 2003). Wilshusen et al (2003) have identified five main challenges commonly encountered in efforts aimed at joining biodiversity conservation with development goals, namely: social scientific uncertainty, low organisational capacity, rapid institutional change, weak local participation, and contravening understandings of nature and conservation.

Social scientific uncertainty: Conservation biologists and ecologists have noted a significant degree of scientific or ecological uncertainty regarding the dynamics of ecosystems and associated human impacts, while on the other hand, social scientists, using social impact assessment (SIA), face huge challenges in predicting the social impacts related to

conservation interventions (Barrett et al, 2011; Wilshusen et al, 2003). The above summarises the challenge of social scientific uncertainty when attempting to join conservation and development. The result of social scientific uncertainty is a rather precautionary and restrictive stance (Barrett et al, 2011; Wilshusen et al, 2003). Ecological or scientific uncertainty has translated into maximisation of protection of high priority ecological areas with a minimum of human interference, while on the other hand, social uncertainty has translated into an avoidance of potentially socially disruptive conservation interventions (Wilshusen et al, 2003).

The two uncertainties above have made conservation and sustainable development to drift to opposite poles with some conservationists saying that their role is to protect biodiversity and not social development, with the latter being viewed as a sole responsibility of those in development circles. On the other hand, some social scientists are advocating for socially just conservation approaches that should contribute meaningfully towards poverty reduction.

Low organisational capacity: A complex array of organisations participate in biodiversity conservation including, *inter alia*, local agrarian associations, state agencies, regional NGOs, multilateral development organisations and international aid organisations (Doak et al, 2014; Dudley, 2008; Minteer and Miller, 2011; Stolton, 2010b; Wilshusen et al, 2003). Each of these organisations feature distinct structures, behaviours and capacities that often make much needed inter-organisational interaction and collaboration difficult (Dudley, 2008; Stolton, 2010b; Wilshusen et al, 2003). For example, though widely hailed as effective structures for change, the limitations of NGOs include their overpowering of local organisations, and favouring of external values and perspectives over local ones (Brechin et al, 2003). Statal or governmental conservation organisations, on the other hand, often lack political power, administrative and technical means, and effective governance systems to both maintain protected areas and work with local communities (Wilshusen et al, 2003).

Brechin et al (2003) have identified at least three structural inefficiencies or pathologies in conservation organisations. First, are large centralised ‘tall’ organisations which tend to be less capable of responding effectively to complex, rapidly changing situations. Second, are decentralised organisations where greater decision-making power and resources are given to sub-units. While decentralisation can offer greater flexibility to attend to situations on the ground, it can easily produce inefficiency, with coordination among units often difficult. The third type of structural inefficiency, more common among public than private organisations,

is the separation of structure from action mainly for political reasons. New structures or practices are created more to appease public expectations or meet legal requirements than to achieve effective implementation. These tend to produce negative outcomes in the long-term since they raise constituency expectations yet lacking the capacity to perform effectively in practice (Brechin et al, 2003).

The organisational pathologies above often result in partial or ineffective programme implementation and can also make inter-organisational collaboration difficult (Brechin et al, 2003; Wilshusen et al, 2003). Conservation organisations should therefore endeavour to eliminate the above organisational inefficiencies by, for example, maintaining a balance between local responsiveness (decentralisation) and overall coordination (hierarchy) (Brechin et al, 2003). They should also come up with measures to ensure enhanced inter-organisational interaction and coordination as this is crucial for successful conservation particularly where it is being pursued in conjunction with poverty reduction. In addition, where conservation organisations are working with local communities, they should avoid an imposition of their foreign values and try to integrate traditional local values within their approaches so as to avoid local resentment (Cox et al, 2014; Cronkleton et al, 2012; Liu et al, 2010; Rawlins and Westby, 2013). The challenge of organisational capacity is more likely to be experienced by organisations attempting to join conservation with development goals.

Rapid institutional change: It is worth noting that conservation organisations and conservation programmes operate within an institutional environment consisting of formal and informal rules governing action (Wilshusen et al, 2003). The institutional environment is expressed as laws, policies and programmes and these have been found in many nations, especially in the developing world, to have a tendency towards political instability, frequent change, and unequal access to resources, yet these influence local and regional decision-makers on land use (Wilshusen et al, 2003). The end result is a situation where political processes, far removed from rural areas where conservation programmes take place, often help produce barriers to both biodiversity conservation and community development (Brown, 1998; Cole, 2012; Roe and Elliot, 2005; Wilshusen et al, 2003).

Weak local participation: Closely linked to the organisational and institutional challenges in endeavours at joining conservation and development is the difficulty in generating strong local participation in conservation and development activities (Buta et al, 2014; Wilshusen et al, 2003). Wilshusen et al (2003) note that whereas organisational and institutional issues

relate to the structure of biodiversity conservation interventions, the issue of participation focuses on conservation programmes' decision-making processes. Low levels of local participation have been recorded in many studies of projects that seek to integrate conservation and development (Bremer et al, 2014; Buta et al, 2014; Leisher et al, 2010; Wunder, 2005; Wells and Brandon, 1992), with the most common barriers to local participation being divergent goals among groups; knowledge differences; histories of domination; lack of tenure rights, and class, ethnic and status differences (Awono et al, 2014; Bremer et al, 2014; Wilshusen et al, 2003).

Studies of conservation and development initiatives have also shown that local people can participate effectively in projects resulting in resounding success, especially where outside groups work with local people from the onset encouraging local organisations and developing regional support networks (Cox et al, 2014; Liu et al, 2010; Pimbert and Pretty, 1995; Wilshusen et al, 2003). The significance of local participation in conservation and development projects is clearly demonstrated in Colombia's Biopacifico project between 1992 and 1998. Despite the project's stated goal of developing a regional biodiversity conservation and sustainable development strategy based on local participation, it was not until mid-1995 that representatives of indigenous communities had a significant role in decision-making (Wilshusen et al, 2003). A combination of institutional changes, outside pressures, and internal project reform opened space for dialogue between project staff and grassroots actors who strongly criticised the way in which the project was being implemented. This resulted in a reorganisation and reformulation of Biopacifico's focus and approach, turning what many had already considered to be a failed project into a qualified success story (Wilshusen et al, 2003).

Contravening understandings of nature and conservation: While many and divergent groups ranging from farmers to conservation biologists agree that natural systems are being degraded and species are being lost, this wide spectrum of players, however, presents very different ways of thinking about how to protect biological diversity (Barbault, 2011; Brockington et al, 2008; Doak et al, 2014; Minteer and Miller, 2011; Wilshusen et al, 2003). In particular, the role of humans in protected areas has generated polarised debates with one view promoting the preservation of representative portions of the world's ecosystems free from human interference, while another perspective views sustainable use and controlled settlement as a

more equitable way of maintaining ecologically valuable landscapes (Minteer and Miller, 2011; Wilshusen et al, 2003).

The two views above, though not completely mutually exclusive, mark a key philosophical separation regarding the relationship between humans and the natural world and this makes any attempt at joining biodiversity conservation and social justice a very complex undertaking (Wilshusen et al, 2003). Yet the urgency of both the biodiversity conservation and social justice crises around the world increases the need to act quickly (Wilshusen et al, 2003).

Pursuing conservation with social justice is certainly a complex task riven with many attendant challenges including the ones discussed above. Yet in spite of these challenges, it is important that conservation organisations pursue this task as it would be very difficult, if not impossible, for their projects to succeed as islands in the midst of poor local communities. The above challenges of joining conservation and development have been accompanied by a clarion call by some conservationists for a return to exclusionary and protectionist conservation approaches and this is the focus of the next section.

3.11 The resurgence of protectionism

The end of the 20th century witnessed an emergence in international biodiversity conservation literature of a re-assessment of community conservation and the idea of sustainable use (Adams, 2004; Hutton et al, 2005; Lele et al, 2010; Roe, 2008; Wilshusen et al, 2002). The proponents of this new body of literature argued that current people-oriented approaches to biodiversity protection were failing as witnessed by a continuing global biodiversity crisis due to diverse human activities including, *inter alia*, agricultural expansion and the harvesting of various biodiversity components (Adams, 2004; Doak et al, 2014; Hou et al, 2014; Hutton et al, 2005; Roe, 2008; Wilshusen et al, 2002). They viewed species rich zones in national parks and other protected areas, mainly housed in tropical developing countries, as the ‘last stands’ of biodiversity which however were not being managed effectively to protect biodiversity (Kramer et al, 1997; Wilshusen et al, 2002). The result was a call by some conservationists for a renewed emphasis on strict protection, a resurgence of the protection paradigm.

Chief among the advocates for a return to protectionism in conservation were John Terborgh (1999) who wrote *Requiem for Nature*, John F. Oates (1999) who wrote *Myth and Reality in*

the Rainforest; Randall Kramer, Carel van Schaik and Julie Johnson (1997) who edited *The Last Stand: Protected Areas and the Defence of Tropical Biodiversity*; and Katrina Bond, Kent Redford and Steven Sanderson (1998) who edited *Parks in Peril: People, Politics and Protected Areas* (Wilshusen et al, 2002). These four books present similar arguments in support of exclusionary, back to barriers conservation excluding all forms of human influence in protected areas (Wilshusen et al, 2002).

In particular, the above authors argue that the current people-oriented approach to biodiversity conservation is too broad as it attempts to marry two conflicting objectives of species protection and development (Adams, 2004; Brandon, 1998; Gustavsson et al, 2014; Kramer et al, 1997; Mukul et al, 2010; Rabinowitz, 1999; Salafsky, 2011; Wilshusen et al, 2002). These authors further argue that conservation programmes have been diluted by approaches that promote community development and greater local participation in decision making and recommend that conservation should desist from attempting to be 'all things to all people' but should focus on its central goal of nature protection (Wilshusen et al, 2002). However, the arguments for a return to protectionism have been fiercely dismissed by other conservationists as representing a return to a failed past, a reinvention of a square wheel (Wilshusen et al, 2002). The arguments and counter-arguments for and against protectionism are presented below.

3.11.1 The arguments and counter-arguments for a return to protectionism

Wilshusen et al (2002) have presented five core arguments summarising the protectionist argument. They have gone further describing these arguments as being incomplete, citing various reasons as presented below.

3.11.1.1 Protected areas require strict protection

Proponents of protectionism such as Terborgh (1999) argue that a combination of economic and demographic forces are destroying the natural ecosystems of the world, particularly in tropical countries, at an alarming rate. This biodiversity crisis has heightened the importance of parks and other protected areas as the 'last bastions' of nature (Terborgh, 1999), the final bulwark erected to shield nature from complete collapse (van Schaik et al, 1997). The constant reminder in the conservation literature, however, is that parks have not been able to effectively perform their vital role as the last safeguard against biodiversity loss, particularly of large mammal species (Adams, 2004; Barrett et al, 2011; Craigie et al, 2010; Dunn et al,

2014; Galli et al, 2014; Geldmann et al, 2013). The clearance of forests and subsequent extinction of large mammals, particularly primates in West African protected areas (Oates, 1999), and the degradation of parks in South America, particularly Manu National Park in Peru (Terborgh, 1999), were cited as stereotypes indicating the failure of protected areas in halting biodiversity loss (Wilshusen et al, 2002).

Proponents of protectionism further argue that strict protection of parks and protected areas is the only viable strategy for halting the continued loss of biodiversity (Adams, 2004). They call for the enforcement of protected areas restricting human occupation and use, that is, IUCN protected areas categories I-IV (Wilshusen et al, 2002). Oates (1999) argued that the idea that biodiversity could best be conserved through promoting human economic development was a seriously flawed myth which led to reduced priority for biodiversity protection hence leading to continued biodiversity loss in protected areas. Strict-protection advocates therefore call for a movement away from people-oriented conservation approaches towards conservation-oriented approaches if protected areas are ever to attain their primary role as the last bastions of nature (Adams, 2004; Wilshusen et al, 2002; Rabinowitz, 1999).

There is no argument among conservationists that protected areas have not been able to effectively stop the continued loss of biodiversity (Craigie et al, 2010; Dunn et al, 2014; Galli et al, 2014; Wilshusen et al, 2002). There is also consensus among conservationists that protected areas have been, and will continue to be, essential elements of global biodiversity conservation strategy (Wilshusen et al, 2002). While most conservationists agree that some greater protection is required for parks to be more effective in conserving biodiversity, there is however disagreement as to how such protection can and should occur (Wilshusen et al, 2002). Wilshusen et al (2002) further argue that emphasising the ecological maintenance role of protected areas downplays other political understandings of the roles that protected areas play in the context of wider social and cultural spheres. For example, resource-dependent communities may view protected areas as territorial control strategies especially where there are some contested land or where rival ethnic groups are involved (Hitchcock, 1995; Wilshusen et al, 2002). In other cases, parks may be viewed as playgrounds for the rich, for example, the Khao Yai National Park in Thailand which has two golf courses (Wilshusen et al, 2002). Historically, many outside observers including, *inter alia*, communities, activists, and government officials view protected areas as yet another manifestation of external control mirroring earlier periods of imperial domination (Neumann, 1998; Wilshusen et al, 2002).

The above political and historical perspectives of protected areas and conservation practices are important in that they help explain why some locals view management restrictions in protected areas as being illegal, and also how current management approaches have inherited past legacies (Wilshusen et al, 2002; Zerner, 2000).

It is clear that conservation occurs within highly complex and often volatile socio-political contexts which protected area managers cannot ignore (Wilshusen et al, 2002). It is also worth noting that conservation also contributes to some of these socio-economic and political problems in rural settings by altering the local playing field (Bennett and Dearden, 2014; Brockington and Igoe, 2006; Clements et al, 2014; Wilshusen et al, 2002). This leaves no room for strict protection but a conservation enforcement process involving concerted negotiation with affected parties (Wilshusen et al, 2002).

3.11.1.2 Biodiversity protection is a moral imperative

As shown earlier, pragmatic and utilitarian arguments for conserving biodiversity are limited. This is because they are built upon fragile assumptions which are not self-sustaining at closer examination (Kramer and van Schaik, 1997; Noss and Cooperrider, 1994; Terborgh, 1999). The pragmatic argument automatically condemns to extinction all species of seemingly no economic value (Doak et al, 2014; Maynard et al, 2014). According to Terborgh (1999), utilitarianism makes biodiversity 'worth more dead than alive' as value is seen only in use. According to protectionist thinking therefore, only a moral argument for biodiversity conservation can ensure its preservation (Minteer and Miller, 2011). The moral argument states that biodiversity must be conserved for its own sake and not because it has present utilitarian value (Maynard et al, 2014; Minteer and Miller, 2011; Terborgh, 1999).

The moral argument by Terborgh is based on two basic rights which are, the intrinsic right of nature to exist, and the right of global, regional, and local communities to enjoy the aesthetic qualities of nature now and in the future (Wilshusen et al, 2002). The second right is at the heart of the belief by many conservationists that the international community should act on behalf of nature in different parts of the world as 'global citizens' which ultimately justifies foreign involvement in the management of a country's biodiversity (van Schaik and Kramer, 1997; Wilshusen et al, 2002). Local interests and values should not ignore national, regional or global biodiversity concerns but should combine with these non-local interests in

promoting the common good for all (Sanderson and Redford, 1997; van Schaik and Kramer, 1997).

There are, however, some oversights from the moral argument underlying the protectionist perspective. One such oversight emanates from a failure to acknowledge that there are numerous and diverse ways of understanding and appreciating nature that also directly affect dialogue on biodiversity protection besides the scientific explanations that are often prioritised by conservationists (Taylor, 2000; Wilshusen et al, 2002). There are complex social and cultural histories that shape different people's understandings of, and relationships to, the natural world and failure to recognise such intellectual and philosophical traditions limits conservationists' dialogue with other groups including a wide variety of local communities (Liu et al, 2010; Wilshusen et al, 2002). Such dialogue would increase the likelihood of uncovering creative solutions carrying greater legitimacy for all parties (Cox et al, 2014; Liu et al, 2010; Soule and Lease, 1995; Wilshusen et al, 2002).

Another oversight emerges from the protectionist claim that local interests should not supercede regional, national, and global interests. While it is correct that nature protection serves the common good, which justifies local restriction, the problem comes with the assumption that both local and non-local interests are at par (Wilshusen et al, 2002). Such an argument is unsustainable because locals will face direct economic challenges due to conservation restrictions imposed for the 'common good' (Wilshusen et al, 2002). The term 'common good' in this case will now refer to special interests for the elite imposed on the rural poor (Wilshusen et al, 2002). It is clear that local people carry a disproportionately huge burden of the negative social, cultural and economic impacts from conservation restrictions (Bennett and Dearden, 2014; Brockington and Igoe, 2006; Clements et al, 2014; van Schaik and Kramer, 1997). This therefore calls for a balance between local and non-local interests that is more realistic and objective.

Concerning the moral argument on the intrinsic rights of nature, biodiversity programmes should not hinder the attainment of human rights for people living in or near protected areas (Bennett and Dearden, 2014; Buta et al, 2014; Gurney et al, 2014; Scherl et al, 2004; Wilshusen et al, 2002). This is because if nature protection occurs at the expense of humans, it becomes indefensible (Wilshusen et al, 2002). Separating humans and nature as a means of protecting nature may produce polarised 'pro-nature' and 'pro-people' forces (Wilshusen et al, 2002). Measures therefore need to be taken so as to promote both human rights and the

intrinsic rights of nature, which actually eventually boils down to the more realistic notion of conservation with sustainable utilisation.

3.11.1.3 Conservation linked to development does not protect biodiversity

Proponents of protectionism, as shown earlier, view conservation and development as conflicting goals (Gustavsson et al, 2014; Kramer et al, 1997; Kramer and van Schaik, 1997; Mukul et al, 2010; Salafsky, 2011). The incompatibility of conservation and development has chiefly been supported by two main conclusions. First, advocates of strict protection argue that sustainable use depletes biodiversity (Redford and Richter, 1999; Robinson, 1993). Second, experience with ICDPs has shown them to be ineffective in safeguarding protected area core zones (Agrawal and Redford, 2006; Bauch et al, 2014; Brandon et al, 1998a; Galli et al, 2014; Higgins-Zogib et al, 2010; Minteer and Miller, 2011; Scherl et al, 2004; Wells and Brandon, 1992). Concerning the issue of sustainable use, Brandon et al (1998a) argue that while politically expedient and intellectually appealing, the promotion of sustainable use as a means to protect resources is not well grounded in biological and ecological knowledge. They further argue that not all things can be protected through use and, in addition, not all places should be open to use. While it is reasonable to argue that not all places should be open to use, a question automatically arises as to whether all protected areas should be closed to use (Wilshusen et al, 2002). There are suggestions that the evidence against controlled resource use in protected areas is not as conclusive as suggested by proponents of strict protection (Bauch et al, 2014; Redford and Sanderson, 2000; Wilshusen et al, 2002). In fact, some of those against sustainable use such as Kramer and van Schaik (1997) are careful to point out that use strategies may be worthwhile community development pursuits away from protected areas (Wilshusen et al, 2002).

Wilshusen et al (2002) argue that the view that sustainable use does not protect biodiversity would ignore the important role that it plays as one crucial component of a broader landscape conservation strategy. Indeed, controlled use may be the only viable political and economic alternative for large tracts of tropical forests and other ecosystems (Saha and Sundriyal, 2012; Schwartzman et al, 2000a; Shackleton and Pandey, 2014; Wilshusen et al, 2002). For example, sustainable use strategies have played a crucial role in reversing large-scale conversion of tropical dry forest in Quintena Rao in Mexico, where community forest management projects have saved forests against the expansion of industrial agriculture and cattle ranching (Schwartzman et al, 2000b).

Most arguments against sustainable use in and around protected areas tend to ignore the fact that, more often than not, parks adjoin areas with pre-existing land use rights, or where landless migrants arrive from other regions in search of resources or political refuge (Liu et al, 2010; Wilshusen et al, 2002). Such political realities could best be dealt with by working proactively with these communities in buffer zones to pursue local development so as to direct resource use away from core protected zones (Fisher and Christopher, 2007; Gurney et al, 2014; Meilby et al, 2014; Pinho et al, 2014; Turner et al, 2012; Wilshusen et al, 2002). Supporting strict protection under these circumstances would most certainly be detrimental to conservation. What emerges therefore is a more robust argument that exclusive reliance on authoritarian protection, just as with a universal application of sustainable use, will not protect species (Meilby et al, 2014; Robinson, 1993; West and Brechin, 1991; Wilshusen et al, 2002). There is therefore need for a context-specific balance between protection and sustainable use.

The second conclusion in support of the protectionist argument that conservation linked to development does not protect biodiversity draws from experiences with ICDPs (Wilshusen et al, 2002). The argument here is that conservation has been diluted by social goals like poverty reduction and social justice (Wilshusen et al, 2002), with ICDPs and other participatory strategies emphasising on development at the expense of nature protection (Agrawal and Redford, 2006; Bauch et al, 2014; Brandon, 1997; Redford et al, 1998). A number of myths associated with joining conservation and development have also been uncovered, chief of which being the assumption that local people will stop exploiting resources within protected areas if their incomes increase or are economically compensated for opportunity costs (Brandon, 1997; Brandon, 1998; Wilshusen et al, 2002). Such assumptions have been deemed too simplistic, given the complexity of human behaviour.

Some commentators have recorded that ICDPs actually increase rather than reduce human pressures on protected areas (Brandon, 1997; McShane et al, 2011; Scholte and de Groot, 2010; Terborgh, 1999). Terborgh (1999) argues that by stimulating the local economy, an ICDP may create mini-development poles that may in some cases vastly increase local populations and resource use demands. He further argues that by focusing entirely on local level processes, ICDPs ignore larger political and economic processes that affect resource use decisions by local people. Such broader forces are often the root causes of pressures on protected areas (Brandon et al, 1998b; Kramer et al, 1997; Sanderson and Redford, 2003;

Terborgh, 1999). For example, central government makes decisions on, among others, availability of rural credit, subsidies and tax incentives, raising or lowering of trade barriers, laws governing labour practices, receptivity to foreign capital, stability of national currency, all of which strongly affect the lives of rural people (Terborgh, 1999). These and other shortcomings have made ICDPs ineffective in ensuring sufficient biodiversity protection (Kellert et al, 2000; Wells et al, 1999), with many projects around the world presenting mixed results (Larson et al, 1997; Mukul et al, 2010; Naughton-Treves et al, 2005; Wells and Brandon, 1992).

While ICDPs may seem to have been ineffective in protecting biodiversity in most cases, abandoning this approach to conservation would be a serious mistake (Wilshusen et al, 2002). It is worth noting that a highly complex array of social, economic, political, and ecological factors shape the challenges of nature protection and perhaps an integrated approach like the one offered by ICDPs could respond more effectively to such challenges (Bennett and Dearden, 2014; Clements et al, 2014; Wilshusen et al, 2002). Advocates of protectionism also fail to recognise the important lessons that conservationists, through ICDPs, have learned from working with a wide range of groups including local communities, cooperatives, local government and state agencies (Wilshusen et al, 2002). This has helped in revealing how societies are organised and why they may or may not respect protected area management restrictions (Bennett and Dearden, 2014; Wilshusen et al, 2002). Protectionism would derail all existing attempts to build alliances and negotiate programmes with these various societal groups (Wilshusen et al, 2002), and this would certainly bring with it some negative consequences to biodiversity protection. While strict protection advocates argue that other parties should be responsible for social development (Brandon et al, 1998b; Kramer et al, 1997), conservation programmes cannot simply disengage themselves from the socio-political context they find themselves in (Buta et al, 2014; Rawlins and Westby, 2013; Wilshusen et al, 2002).

The protection paradigm also carries with it some misconceptions about local processes (Wilshusen et al, 2002). While local people are often hampered by economic and political decisions by central government (Terborgh, 1999), it is incorrect to assume that they are totally powerless in all cases (Wilshusen et al, 2002). For example, community forestry associations in Mexico played a critical role in shaping national forestry policy in 1986 and 1997 (Wilshusen et al, 2002). It is also worth noting that many observers, including some in

support of protectionism, recognise that timber, oil, mineral and other resource exploitation enterprises with strong political connections often represent much greater threats to protected areas than local rural communities (van Schaik and Kramer, 1997; Vira and Kontoleon, 2010; Wilshusen et al, 2002). While ICDPs might not have managed to effectively protect biodiversity, discarding them would be an act of 'throwing away the baby with the bath water', the good and the bad (Bauch et al, 2014; Wilshusen et al, 2002). There are some good aspects of ICDPs as highlighted above. The scope for improvement is huge and some analysts argue that ICDPs can still be successful with learning and modification, leading to new-generation ICDPs (Fisher et al, 2005).

3.11.1.4 Harmonious, ecologically-friendly local communities are myths

In reaction to a tendency towards the glorification of traditional communities in the conservation literature as being 'ecologically noble savages', strict protection proponents argue that community-based natural resource management by indigenous traditional peoples can no longer guarantee species protection (Terborgh, 1999; Wilshusen et al, 2002). This is because, they argue, rapid social change is causing such peoples to lose the traditional qualities that historically enabled them to live in relative harmony with nature compared to modern societies (Sanchez, 2014; Terborgh, 1999). Protectionists argue that significant changes in the modern era including growing population pressures, increased access to modern technology, erosion of traditional values and increasing market orientation mean that biodiversity conservation objectives can no longer be guaranteed in the hands of indigenous and traditional peoples (Kramer and van Schaik, 1997; Sanchez, 2014; Terborgh, 1999).

Protectionists even further argue that the very notion that indigenous peoples are thought to have lived in perfect harmony with other communities and with nature is mythical (Brandon, 1997; Coria and Calfucura, 2012; Oates, 1999; Redford et al, 1998; Redford and Richter, 1999). Oates (1999) and Coria and Calfucura (2012) point out that there is very little strong evidence suggesting that traditional societies anywhere in the world may have been natural conservationists. They further argue that resource exploitation was typically short-term and with little regard for sustainability, and often led to resource depletion and species extinction unless population numbers and technology were very low. According to Coria and Calfucura (2012), although in some cases indigenous communities have demonstrated a much better ability to maintain forests than have non-indigenous groups, the presumption that indigenous groups are inherently environmentalist is flawed. Many indigenous societies have found it

difficult to manage scarce resources in a sustainable way and over-utilisation of natural resources has been the norm (Coria and Calfucura, 2012; Fennell, 2008). For instance, the rate of clearing in some indigenous reserves in Amazonia was found to be as alarmingly high as 11.3% in a two-year period, with such evidence underlining the fact that the entire socio-cultural environment for indigenous communities is strongly tied to consumptive activities (Coria and Calfucura, 2012). Concerning inter and intra-community harmony, Borrini-Feyeraband (1996) and Agrawal and Gibson (1999) cite complex interests and processes within and between communities and other social actors even among the traditional communities.

The above arguments against traditional communities as natural conservationists however carry with them some simplistic assumptions about these communities. While indeed modern changes are affecting the social fabric of traditional communities, protectionists tend to ignore the possibility that even in the face of rapid change, such traditional groups might adopt sustainable resource use pathways especially with outside support (Cox et al, 2014; Liu et al, 2010; Wilshusen et al, 2002). Local people must therefore not be stereotyped as some will actively work to conserve biodiversity components while others will not (Redford et al, 1998; Wilshusen et al, 2002).

It is worth noting that both customary and modern governance processes shape resource use within and among rural communities and thus, discrediting traditional resource management approaches in favour of a protectionist non-participatory approach would be a mistaken move (Wilshusen et al, 2002). Instead, measures should be adopted that integrate customary resource governance attributes with modern conservation approaches. This could ensure the acceptability and legitimacy of resource management restrictions among traditional communities (Wilshusen et al, 2002).

3.11.1.5 Does the biodiversity crisis require the adoption of radical measures?

Protectionists and various other conservation practitioners rightly point to the rapid extinction of species as an emergency situation requiring the adoption of extreme measures other than current conservation approaches if ever the biodiversity crisis is to be effectively redressed (Brandon, 1998; Dunn et al, 2014; Galli et al, 2014; Geldmann et al, 2013; Kramer et al, 1997; Oates, 1999; Pfund, 2010; Rands et al, 2010; Terborgh, 1999). In this regard, van Schaik and Kramer (19997) identify three conservation proposals namely: increased statal

role in limiting personal freedom for the public good; investment in industrial and urban development so as to promote rural to urban migration; and the possibility of military intervention as a way of protecting biodiversity.

Van Schaik and Kramer (1997) argue that governments have a duty to restrain the freedom of their citizens if this serves the common good of all especially where a conflict of interests emerges. In the case of conservation, the proposal invokes government's stewardship role over natural resources in public trust for the common good of all citizens and can even claim forests as national property because these serve national, as well as international, interests (van Schaik and Kramer, 1997; Wilshusen et al, 2002). While this doctrine is perfectly reasonable, it harbours some profound risks and uncertainties (Wilshusen et al, 2002). It is wrong and dangerous to assume that governments always serve the public interest as most governments worldwide have always favoured some special interest groups with strong political connections such as logging and mineral exploitation industries at the expense of the common good of all citizens (Wilshusen et al, 2002). Such government actions have often been used by rural communities as a strong argument for denouncing any government-imposed conservation-related restrictions on individual freedoms (Wilshusen et al, 2002).

The second proposal by van Schaik and Kramer (1997) as an 'extreme measure' to stop the biodiversity crisis is the promotion of increased industrialisation and urbanisation so as to encourage mass rural to urban migration which would eventually lead to a significant reduction of pressures on biodiversity. The problem with this proposal, however, is that it fails to account for the resource consumption needs of the rural poor who would have moved to urban areas and, most likely, such resource needs would be met by the same rural areas (Wilshusen et al, 2002). The proposal might also result in heightened poverty levels within urban areas, thereby acting just as a tool for transferring poverty from one area to another (Wilshusen et al, 2002). Another possibility is that large enterprises with no interest in conservation would find it easier to buy up the depopulated land for large-scale resource exploitation (Sanchez, 2014; Wilshusen et al, 2002). It is therefore clear that those who think that conservation success can be guaranteed by depopulating the countryside have many questions to answer.

The third proposal for ensuring the protection of nature is military in nature. van Schaik and Kramer (1997) cherish the possibility of using the military in achieving conservation success. However, they are quick to hint that the military option may cause resentment among local

residents which may reduce local support for conservation and therefore may only be applied as a last resort. Drawing from the widely used concept of a peacekeeping force, Terborgh (1999) advocates for the creation of an internationally financed 'nature-keeping force' to safeguard nature. The first challenge with the military option for nature protection is that there is a possibility that authoritarian governments may use conservation to further their own political ends in rural areas, especially where ethnic groups are involved (Peluso, 1993; Wilshusen et al, 2002). It is worth noting that the military in most developing countries serve elite and not public interests (Wilshusen et al, 2002). The proponents of the military option are also not clear about which 'last resort' situations would call for military intervention in conservation (Wilshusen et al, 2002). Another question which has been asked by Duffy (2000) is on whether 'killing for conservation' would be a justifiable resource management move. The military alternative to ensure the success of conservation is certainly highly debatable, sensitive and, above all, capable of bringing far reaching negative consequences to the conservation cause.

3.11.2 A reflection on the protectionist arguments

No one disputes the fact that the world is experiencing an emergency situation in the name of the biodiversity crisis, and that greater, or probably extreme, protection measures need to be adopted in order to safeguard the world's biodiverse regions from imminent collapse. However, when it comes to which extreme measures to take, and the level of extremity to be contained in such measures, the disagreements are clearly obvious (Barbault, 2011; Brockington et al, 2008; Doak et al, 2014; McShane et al, 2011; Minteer and Miller, 2011). On one side are those suggesting that the "the stick must once again supplant the carrot" through the adoption of authoritarian protectionism (Wilshusen et al, 2002: 30). This, however, has the likely consequence of alienating key resource management allies at local, regional and international levels thus opening the floodgates of resistance to conservation measures. On the other side are those calling for participatory, ecologically-sound, politically-feasible and socially-just conservation programmes in specific contexts that can be legitimately enforced based on strong agreements with all affected parties (Buta et al, 2014; Meilby et al, 2014; Wilshusen et al, 2002). It is worth noting that most of the remaining ecologically rich zones of the world are located in areas with rampant poverty and political instability (Fisher and Christopher, 2007; Gurney et al, 2014; Meilby et al, 2014; Pinho et al, 2014; Turner et al, 2012).

While protectionism may more likely be effective in safeguarding biodiversity, it is also very likely to be resisted by local communities disproportionately dependent on nature for subsistence. On the other hand, combining conservation with development has been viewed by some as a recipe for ecological failure as the agendas become too broad to handle effectively (Agrawal and Redford, 2006; Bauch et al, 2014; Redford et al, 1998). What is certainly clear however is the fact that the room for a return to strict protectionism is quite limited as this represents a failed past difficult to justify socially, politically and economically. At the same time, it cannot as yet be concluded with confidence that ICDPs have failed on all accounts and are thus useless in all contexts (Wilshusen et al, 2002). There is huge scope for a further refinement and improvement of conservation-development initiatives as evidenced by the continued emergence of new-generation ICDPs such as PES, REDD+ and other poverty-conservation mechanisms (Lele et al, 2010; Mombo et al, 2014). The juxtaposition or colocation of most of the world's biodiversity hotspots with poor rural communities requires protected area managers to make some carefully crafted trade-offs between conservation and social justice, and this is the subject matter of the next section.

3.12 Trade-offs between conservation and development: from win-win to hard choices

Conservation and poverty reduction are legitimate societal goals (Roe and Walpole, 2010), which have both assumed pre-eminence on the international agenda (Redford et al, 2008). While the loss of global biodiversity is well documented, there is considerable debate among conservationists on which options to adopt for a most effective response (McShane et al, 2011). Given the colocation of human poverty and biological wealth (McShane et al, 2011; Redford et al, 2008; Roe and Elliot, 2005), one obvious approach is to design management responses that enhance the well-being of local people while simultaneously halting biodiversity decline (McShane et al, 2011). While, as shown earlier, there are some within conservation circles advocating for strict protectionism, such a move would be socially and politically unacceptable and hence eventually detrimental to conservation (Wilshusen et al, 2002).

During the past several decades, conservationists have sought win-win approaches that conserve biodiversity while also enhancing social and economic development for local people (McShane et al, 2011). This has been the basis of popular ICDPs and similar approaches (Fisher et al, 2005). Unfortunately, a growing empirical evidence seems to indicate that such win-win solutions that both conserve biodiversity and promote human well-

being are not easy to realise and it is naïve to expect them everywhere (Goldman et al, 2010; McShane et al, 2011). More realistically, trade-offs between the benefits afforded by conservation and those arising from mainstream approaches to poverty reduction are inevitable, and will occur across a variety of places and contexts (McShane et al, 2011; Roe and Walpole, 2010). A continued emphasis by conservation practitioners on win-win solutions, while ignoring the realities of trade-offs between conservation and development, creates a vicious cycle of optimism and disappointment as successive supposed panaceas fail to meet expectations (Hirsch et al, 2010; McShane et al, 2011). A new challenge for conservationists, therefore, is to find ways to identify and acknowledge the trade-offs and hard choices that are involved in advancing conservation and development in specific places and through specific approaches (McShane et al, 2011). A win-some-lose-some scenario in conservation and development is therefore more realistic.

This section explores the reasons behind a growing trade-offs and hard choices thinking and a dusking win-win rhetoric in the conservation-development nexus. Guiding principles for analysing trade-offs and hard choices are also presented, together with some challenges in trade-offs thinking.

3.12.1 The evasive promise of win-win and the need for trade-offs thinking

Win-win rhetoric has become common among international organisations to describe the simultaneous achievement of positive conservation and development outcomes especially regarding the link between the environment and poverty reduction (McShane et al, 2011). Such a win-win link between poverty and the environment is acknowledged and promoted by many international development platforms including the MDGs, the UNDP-European Commission Poverty and the Environment Initiative, and the CBD, with many conservation organisations increasing their efforts aimed at poverty reduction within their conservation portfolios (McShane et al, 2011). Three qualities of win-win approaches to conservation and development make them appealing: they appear ethical because they acknowledge the dual moral imperative of protecting ecosystems and reducing human poverty, they appear to be efficient as they seek to create synergies between local needs and conservation priorities and, finally, they appear to be marketable as they promise no losses to biodiversity and human well-being in a single approach (McShane et al, 2011).

While the win-win rhetoric is apparently so appealing, international conservation experience it the last four decades now seems to unfortunately suggest that such win-win solutions that both conserve biodiversity and promote human well-being are difficult to come across in reality (Campbell et al, 2010; Goldman et al, 2010; McShane et al, 2011; Roe and Walpole, 2010; Romero et al, 2012; Salafsky, 2011). Rarely have initiatives realised outcomes that benefit local people while simultaneously sustaining biodiversity conservation values (Hirsch et al, 2010; McShane et al, 2011; Miller et al, 2011). Indeed ICDPs have been criticised as being flawed and ineffective (Fisher et al, 2005; Wells and Brandon, 1992; Wilshusen et al, 2002). On the conservation side of the equation, critics argue that humans usually improve their condition at the expense of biological diversity, with initiatives in buffer zones acting as growth magnets attracting more people thereby exacerbating negative ecological impacts (McShane et al, 2011; Scholte and de Groot, 2010; Wilshusen et al, 2002). On the human well-being side of the equation, attempts to link economic benefits with conservation initiatives have been criticised for: not benefiting targeted communities early enough; for not being able to provide income-generating, labour-intensive activities that satisfy the livelihood needs of local people; for failing to distribute benefits effectively, with benefits going to the elites rather than the poorest of the poor disproportionately dependent on natural resources; and for coming into conflict with already existing livelihoods strategies (Leisher et al, 2010; McShane et al, 2011).

It eventually emerges therefore that labelling projects and policies as win-win emanates from a failure to provide a broad enough view of the multiple dynamics and complexities of most conservation and development scenarios (McShane et al, 2011). Many examples can be cited in support of the need to move beyond the win-win mind set. For example, in many countries, biofuels have long been viewed as promoting win-win outcomes for national governments, the global environment and local job creation (McShane et al, 2011; Venghaus and Selbmann, 2014). However, a deeper analysis of biofuels policies has exposed some serious negative impacts (McShane et al, 2011; Mitchell, 2008). Dramatic investments in biofuels in Brazil, Malaysia and Indonesia have also speeded up deforestation with forests rapidly being replaced by sugar and palm oil monocrops (McShane et al, 2011). Biofuels production has also been associated with rising land tenure conflicts, food insecurity and an increasing scarcity of water for local settlers in many parts of the world (Jumbe and Mkondiwa, 2013; McShane et al, 2011; Venghaus and Selbmann, 2014). The initial enthusiasm on biofuels

investments has begun to dampen as associated trade-offs increasingly become apparent, with doubt and uncertainty casting shadows on the future of the industry (McShane et al, 2011).

Another example exposing shortfalls in win-win thinking comes from REDD (Wunder, 2008). As shown earlier, REDD involves mechanisms for reducing carbon emissions through which landowners or governments are paid to lower their rates of deforestation and conversion of forest to other land use types that sequester less carbon, with most of the funding coming from industrialised countries in the form of donations or from funds linked to carbon markets (Delacote et al, 2014; Hirsch et al, 2010; Pandey et al, 2014). According to win-win narrative, REDD has been portrayed as an ideal mechanism which will produce positive results in the form of poverty reduction, ecosystem protection and climate-change mitigation (Hirsch et al, 2010; UN-REDD, 2009). The compensation of people, groups, or countries for their efforts to reduce deforestation and forest conversion has been hailed as a potential stimulus for economic development at local and national levels (Hirsch et al, 2010).

In spite of all the positive projects from REDD, many actual and potential negative impacts have been identified. Some commentators have argued that REDD may serve as an impetus for industrialised countries to reduce efforts to minimise carbon-emitting activities or to reduce investment in clean and renewable energy technologies (Delacote et al, 2014; Hirsch et al, 2010; Levin et al, 2008). There are also fears that while REDD policy may protect forests in some areas, losses may result in others through, for example, the growing of monocrops of fast-growing trees thereby reducing species richness and ecological complexity (Hirsch et al, 2010; Leventon et al, 2014; Levin et al, 2008). A major challenge with REDD is that it is usually the wealthy with more secure tenure and access to larger areas of forests who benefit disproportionately at the expense of the poor (Awono et al, 2014; Campbell, 2009; Hirsch et al, 2010; Levin et al, 2008). Local communities may also lose control of forest resources where, for example, government or other powerful interests appropriate newly valuable forests (Hirsch et al, 2010; Leventon et al, 2014). Hirsch et al (2010) further argue that this could increase deforestation where, for instance, community-based forest management has been proven to be more effective than other conservation approaches. It is therefore apparent that REDD involves both gains and losses, and this is in outright contrast with the win-win rhetoric that has often been associated with it.

A review of projects supported by the GEF revealed that expectations of win-win proved unrealistic in the majority of these projects (McShane et al, 2011; Salafsky, 2011). This is

because most GEF biodiversity projects involve some form of restriction on existing patterns of resource exploitation leading to loss of livelihood and development opportunities for some people particularly the poor (McShane et al, 2011).

Evidence is thus growing which suggests that win-win initiatives designed to simultaneously advance ecological conservation and social development have fallen short of one or both these goals (Campbell et al, 2010; Hirsch et al, 2010). Frustrated expectations have ushered in the new conservation debate pitting ‘ nature protectionists’ defending a strong protected areas approach turning away from the plight of communities adjacent to protected areas, against ‘social conservationists’ embracing sustainable use, ecotourism, and poverty alleviation efforts (McShane et al, 2011; Miller et al, 2011) as discussed earlier. Given the ecogeography of human poverty and biological richness, the first argument falters naturally. A positive development in the last few decades, which will certainly boost and somewhat legitimise the second argument, is the growing acknowledgement of trade-offs and hard choices between conservation and development (Goldman et al, 2010; Hirsch et al, 2010; McShane et al, 2011; Roe and Walpole, 2010; Romero et al, 2012).

The emergence of trade-offs thinking is a result of the growing recognition that many situations on the ground involve competing, rather than the complementary social, economic, and ecological goals preached by the win-win rhetoric (Hirsch et al, 2010; McShane et al, 2011; Romero et al, 2012). The essence of trade-offs thinking is that when some things are gained, others are lost, and acknowledging trade-offs thus implies acknowledging not only the gains, but also the real, potential and perceived losses incurred through various choices and activities in the domain of conservation and development (McShane et al, 2011).

Hirsch et al (2010) identify a couple of benefits inherent in trade-offs thinking. Identification and analysis of trade-offs can (Hirsch et al, 2010: 260):

- invite and promote dialogue, creativity, and learning
- allow for more comprehensive planning
- reduce the probability of disappointment associated with a policy or initiative that yields mixed outcomes
- allow for the acknowledgement of conflicting views and interests and thus facilitate deliberation and concerted negotiation

- help legitimise the possibility of choosing not to adopt a given policy or participate in a certain programme, which in turn increases the legitimacy of policies that are ultimately adopted
- help decision-makers and those to whom they are accountable confront and take responsibility for difficult choices
- help understand that some loss is inevitable which may allow for progress to be made towards conservation and human well-being objectives even though no alternative meets all interests and values

According to McShane et al (2011), hard choices in the conservation-development nexus are due to a variety of reasons. They are faced when there are trade-offs to be made between different interests and priorities; between long-term and short-term horizons (where typically biodiversity conservation as a long-term objective is traded-off against short-term economic benefits such as conversion to agricultural land); and between benefits at one spatial scale and costs at another. Thinking and communicating in terms of trade-offs and hard choices will thus result in better designed, more resilient, and more sustainable initiatives (Hirsch et al, 2010; McShane et al, 2011).

3.12.2 Paradigms in pitfalls: some challenges in trade-offs thinking

Although the move to trade-offs thinking and analysis in conservation is certainly important, such thinking, and the analytical tools that go with it, is however, not a panacea, and its application to conservation and development can have several pitfalls (Campbell et al, 2010; Hirsch et al, 2010). One of the pitfalls is that the trade-offs concept can be applied in ways that oversimplify or obscure important issues, often by reducing the analytical challenge to one of aggregating and comparing the quantifiable costs and benefits of conservation-development initiatives (McShane et al, 2011). Such an act may obscure values and interests that are difficult to quantify in a widely agreed upon manner (Hirsch et al, 2010). In addition, analytical methods that focus only on costs and benefits also obscure distributional issues such as who loses, who pays, and who benefits? (Hirsch et al, 2010). It is worth noting that there are few institutions yet able to adequately assess and distribute costs and benefits between competing interests once trade-offs have been identified (McShane et al, 2011).

Another pitfall which comes with the application of trade-offs thinking to conservation and development initiatives, and which should be avoided, is the tendency to assume that because

problems can be defined in terms of trade-offs, everything can thus be traded off (Hirsch et al, 2010). Contrary to such thinking, many actors in complex conservation scenarios may feel quite strongly that certain values, such as individual rights, cultural heritage, or species protection, should not be traded off at all (Campbell et al, 2010; Hirsch et al, 2010). Therefore, what constitutes a trade-off for one stakeholder may not be for another (Campbell et al, 2010). In this instance framing a problem in terms of trade-offs by one actor automatically undermines another's ability to protect what they value (Hirsch et al, 2010), and this may sometimes lead to a polarisation of interests.

The framing of a problem in terms of trade-offs, if understood as a means of defining problems in objective terms, can hide the political dimensions of contemporary conservation issues (Hirsch et al, 2010; McShane et al, 2011). This is because in conservation, positive and negative effects occur against a backdrop of inequality and ongoing disputes among the poor, between poor and elite groups, and among poor and elite groups and government (Hirsch et al, 2010). Trade-offs framing can therefore obscure differences in the ability to exercise power that makes it difficult for some actors to voice their interests in decision-making processes (Hirsch et al, 2010). Such societal differences should therefore be factored in if trade-offs outcomes are to be sustainable and resilient.

In spite of the above pitfalls, trade-off thinking and analyses are important for understanding and communicating the multiple dimensions of conservation-development initiatives. While overly optimistic win-win scenarios simultaneously promoting multiple conservation and development objectives may be strategic for funding, ignoring trade-offs can frustrate and even alienate important conservation partners as expected win-win outcomes are not realised (Goldman et al, 2010; Hirsch et al, 2010). What is needed for a more sustainable trade-offs thinking and analysis, however, are tools, methods and approaches that embrace the complexity of conservation's social and political contexts so that trade-offs framing does not obscure political realities, flatten multiple dimensions of value into a single term, or ignore marginalised interests or ways of thinking (Hirsch et al, 2010). The next section presents some general guiding principles for enhancing the analysis of trade-offs and hard choices in conservation-development initiatives.

3.12.3 Guiding principles in analysing trade-offs and hard choices

Resolving trade-offs between conservation and development and the hard choices they entail is difficult because it involves actors from a variety of backgrounds with multiple perspectives, beliefs, preferences and powers (McShane et al, 2011). McShane et al (2011: 969-970) have proposed four broad guiding principles to aid researchers and practitioners in developing a deeper understanding, and better ways of discussing, trade-offs in specific conservation and development initiatives and approaches:

Principle 1: Scale

- different social and ecological values manifest at different scales
- successful negotiation of trade-offs will come only with reasonable attention to political, economic, social, and ecological dynamics at multiple spatial and temporal scales, and are critically dependent on interactions across these scales
- in some cases, dynamics operating at one scale may prevent or constrain successful negotiation of trade-offs at another

Principle 2: Context

- approaches to understanding and negotiating trade-offs should respect the co-evolution of natural and human history
- analytical tools and methods should be applied with sensitivity to political, economic, institutional and social contexts in which decisions about conservation and development occur
- there are no panaceas or one-size-fits-all solutions, nor are there necessarily solutions with long-term staying power: decisions and strategies will have to be revised as new knowledge emerges, and as the social, political, economic and ecological contexts change

Principle 3: Pluralism

- trade-offs are experienced and understood from a variety of legitimate perspectives. At the root of many long-standing disputes are differing models and ways of understanding the complexity of trade-offs decisions

- each perspective highlights certain trade-off dimensions and obscures others. Better formulation of problems can occur when new ways of understanding conservation and development trade-offs are developed collaboratively and iteratively with the input of multiple voices and multiple perspectives
- diligence is necessary to ensure that the voices of all affected parties are heard, understood and respected

Principle 4: Complexity

- human and natural systems are inextricably linked
- many important environmental and developmental issues will always involve uncertainty
- all models and analytical tools for understanding conservation and development issues engage in some form of simplification of complexity, and none provide a comprehensive picture

From the foregoing, it has been shown that win-win outcomes in conservation and development initiatives, though appealing, are difficult to realise and have resulted in unfulfilled high hopes and hence disappointments. This led to the emergence of trade-offs thinking which acknowledges that both positive and negative impacts come out of programmes that attempt to combine conservation and development goals, with hard choices having to be made. The strength of trade-offs thinking lies in its potential to come up with more sustainable and resilient conservation-development initiatives as it embraces social, political, economic and ecological complexities in the real world compared to unrealistic win-win thinking.

The next section presents measures that could be adopted at site, national and international levels for promoting a more successful integration of conservation and poverty reduction strategies. Such measures, if adopted in conjunction with the guiding principles of analysing trade-offs presented above, could result in robust environment-development initiatives.

3.13 Towards integrating protected areas and poverty reduction strategies

Most countries of the world, especially in the developing world, now realise the immense value of natural resources to humans, especially the poor, and the obvious need to conserve such resources for the benefit of current and future generations (Scherl et al, 2004). The 5th

IUCN World Parks Congress in Durban in 2003 came up with a list of actions that need to be taken at three levels, that is, site, national, and international levels so that protected areas are part and parcel of sustainable development endeavours and these are listed below (Scherl et al, 2004: 42-46):

Site level

At the site level, protected area managers could:

- undertake social impact assessment during establishment and during routine management effectiveness evaluations of protected areas
- support integrated conservation and development programmes using innovative approaches
- increase investment in capacity-building among local communities for protected area management
- encourage active participation by local communities in management

National level

At the national level, governments could:

- put in place legal frameworks for the recognition of the right to tenure of land and other property such as natural resources by indigenous and local communities
- develop mechanisms to evaluate ecosystem services provided by protected areas and factor these into national accounting systems, leading to incentives and rewards for stewardship of national public goods such as watershed protection. However, this will only contribute to poverty reduction where the poor have title to land and other property
- encourage inclusive protected area governance systems that recognise customary and traditional rights and give a voice and empowerment to disadvantaged groups
- strengthen and expand protected areas that are co-managed by, for example, government agencies, indigenous and local communities, NGOs or the private sector, or even among state governments as in the case of trans-boundary protected areas
- give greater recognition and develop legal frameworks to support community conservation areas

- encourage the establishment of Category IV, V and VI protected areas that allow for sustainable resource use
- compensate for reduced investment in public infrastructure and services in protected areas
- integrate protected areas into larger scale land use planning for the long-term environmental, economic, and social sustainability of regions
- give greater recognition of the role of protected areas in poverty reduction strategies and the MDGs

International level

At the international level, governments, international aid agencies, NGOs, and the private sector could:

- better define the linkages between protected areas and poverty
- develop new financial mechanisms, in addition to GEF, to support stewardship of international public goods provided by protected areas such as watershed protection, biodiversity conservation, and carbon sequestration

The above three-tier actions echo some semblance to the guiding principles for analysing trade-offs between conservation and development presented earlier. Concurrent adoption of the guiding principles on trade-offs and these three-tier actions at the site, national, and international levels could result in more sustainable environment-development initiatives.

3.14 Conclusion from the review of the literature

Biodiversity conservation and poverty reduction have both become important international societal goals (Roe and Walpole, 2010). The continued decline in the world's biological resources has culminated in the drafting of the CBD among other policies, strategies and programmes, so as to reduce biodiversity loss while, on the other hand, the OECD developed the poverty-focused MDGs in 2000 aimed at reducing the number of the absolutely poor people of the world by 2015 (Ramchandani and Karmarkar, 2014; Turner et al, 2012).

The juxtaposition of most of the world's biodiverse regions with poor rural communities has called for the concurrent pursuance of the above biodiversity conservation and societal goals (Gurney et al, 2014; Meilby et al, 2014; Pinho et al, 2014). There has been a shift in

biodiversity conservation policy, since the second half of the 20th century, from a protectionist preservation paradigm towards a people-oriented conservation perspective embracing the sustainable utilisation of biological resources. This has come out of the realisation that biodiversity conservation areas will most likely not succeed if they ignore the plight of the often poor and marginalised rural communities they share boundaries with (Buta et al, 2014). In other words, conservation approaches that ignore or exacerbate the plight of poor rural communities are difficult to justify socially and morally, and will most likely be resented by these surrounding communities.

Some commentators have, however, argued that the simultaneous pursuit of conservation and development goals has resulted in a policy agenda too broad to handle (Brandon, 1998; Gustavsson et al, 2014; Kramer et al, 1997; Mukul et al, 2010; Salafsky, 2011; Walpole and Wilder, 2008). There are reported cases where conservation-development initiatives have failed to achieve one or both of these goals. It has increasingly been shown that it is unrealistic to always expect win-win outcomes from initiatives endeavouring to concurrently pursue conservation and development objectives thereby calling for the need to factor in some trade-offs and hard choices when pursuing conservation together with development goals (Hirsch et al, 2010; McShane et al, 2011). Trade-offs thinking in conservation-poverty endeavours acknowledges that while some things are gained, others are lost, with win-win scenarios not always attainable.

In spite of some commentators calling for a return to protectionism in conservation, such a move is not justified. This is because conservation, just like all other land uses, is now increasingly expected to play a pivotal role towards poverty reduction and sustainable development, and thus a return to fortress conservation would be tantamount to returning to a failed past, the reinvention of a square wheel.

CHAPTER FOUR: POLICY REVIEW

4.1 Introduction

Zimbabwe is situated in southern Africa between latitudes 15°30′ and 22°30′ south of the equator and between longitudes 25° and 33°10′ east of the Greenwich Meridian (Zimstat, 2010). It is a landlocked country bordered by Mozambique to the east, South Africa to the south, Botswana to the west, and Zambia to the north and north-west. The country covers a total land area of 390 757 km^2 that fall into four main physio-geographic regions which are the Eastern Highlands, the Highveld, the Middleveld and the Lowveld (Figure 4.1) (Feresu, 2010; Wels, 2003). The Eastern Highlands and the Highveld lie between 1200m and 1800m above sea level, the Middleveld lies between 600m and 1200m above sea level, whilst the Lowveld is below 600m above sea level (Feresu, 2010; Government of Zimbabwe, 1998; Wels, 2003).

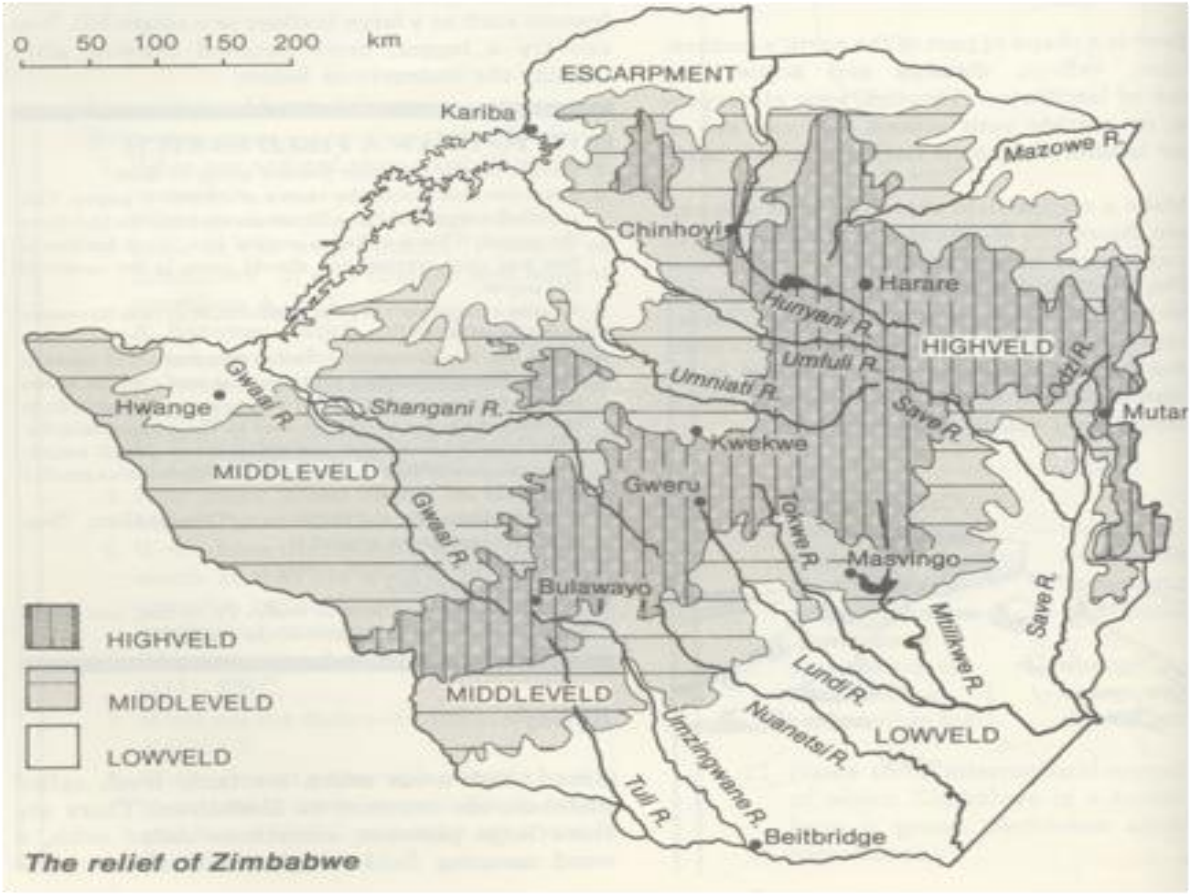

Figure 4.1: The physiographic divisions of Zimbabwe
Source: African Studies Centre (2014)

Zimbabwe is located along the Tropic of Cancer but lies wholly to the north of the Tropic of Capricorn (Chenje et al, 1998). Although well within the tropics, Zimbabwe's climate is sub-tropical, being moderated by altitude (Government of Zimbabwe, 1998; Wels, 2003). The rainy season stretches from November to March, while the cool dry winter season is between May and August. Annual rainfall varies from an average of below 450mm in the low-lying areas to 900mm over the Highveld and 1500mm in parts of the Eastern Highlands (Chenje et al, 1998; Government of Zimbabwe, 1998).

The country is also divided into five agro-ecological regions based on rainfall patterns and agricultural production potential (Vincent and Thomas, 1960) (Figure 4.2). Rainfall intensity and agricultural production potential decrease from Natural Region I towards Natural Region V, with Natural Region I receiving over 1000mm annually and suitable for specialised and diversified farming, while Natural Region V receives less than 450mm and is suitable for extensive cattle and game ranching (Deininger et al, 2004; Vincent and Thomas, 1960). It is important to note that the majority of the communal areas of Zimbabwe are located in Natural Regions IV and V which are less suitable for agriculture.

Zimbabwe is endowed with a rich diversity of life forms (Feresu, 2010). The country's varied climatic, adaphic, and topographic conditions support a wide range of fauna and flora that play a critical role in the socio-economic, and ecological well-being of the country (Ministry of Environment and Natural Resources Management, 2010). The country's economy heavily depends on natural resources for generating employment, income, and foreign exchange (Chenje et al, 1998; Feresu, 2010). For example, agriculture, forestry and fisheries contributed 18% to the country's GDP in 1996 in comparison to manufacturing, 17%; mining, 5%; and distribution, hotels and restaurants (including tourism), 18% (Chenje et al, 1998; Government of Zimbabwe, 1998). The forestry industry employed more than 13 800 people and generated over US$ 30 million in 2007 through the export of various timber products (Feresu, 2010).

Figure 4.2: Categorisation of agro-ecological regions in Zimbabwe
Source: Food and Agriculture Organisation (FAO, 1998)

The forests also produce various NTFPs including, *inter alia*, traditional medicines, edible insects, thatch grass, honey, fruits and vegetables, bark fibre, firewood, and 'wild' meat (Chenje et al, 1998; Feresu, 2010; Government of Zimbabwe, 1998; Maroyi, 2011; Mutenje

et al, 2011). NTFPs are particularly important in rural areas where the majority of the people depend on them for their livelihoods and income generation (Feresu, 2010; Maroyi, 2011; Mutenje et al, 2011). The FAO (2001) notes that NTFPs contributed over 35% of the average rural incomes in some parts of Zimbabwe in 2005. Although agriculture plays a vital role in rural households, the contribution of non-farm income sources, remittances and activities based on environmental resources has increasingly been recognised particularly among the poorer households (Stack and Sukume, 2006).

The population of Zimbabwe was 10.4 million in 1992, rose to 11.8 million in 1997, and decreased slightly to 11.6 million in 2002 (Central Statistical Office, 2004). According to the 2012 census, Zimbabwe's population stands at 12.97 million, with an annual average intercensal growth rate (2002-2012) of 11%, average household size of 4.2, and a population density of 33 persons per km^2 (Central Statistical Office, 2012). The population of Zimbabwe is growing geometrically and such a growing population poses challenges to the country's biodiversity as the demand for natural resources continues to increase (Central Statistical Office, 2012). It is worth noting that approximately 70% of the country's population resides in rural areas where, due to poverty, people tend to rely on natural resources for their survival (Feresu, 2010; Government of Zimbabwe, 1998).

Access to natural resources has changed over the years in Zimbabwe. At least three broad periods of natural resource utilisation and conservation can be identified in Zimbabwe, namely, the pre-colonial period, the colonial period and the post-independence period (Bond, 1999; Chenje et al, 1998; Mashinya, 2007; Muboko and Murindagomo, 2014). The post-independence period can, however, more conveniently be discussed as two separate periods which are the first two decades after independence (1980-2000), and the third decade starting in 2000. This chapter reviews the relationship between people (particularly in the rural communal area) and natural resources in Zimbabwe during these four periods. It ends by exploring rural development initiatives in post-independence Zimbabwe and the reasons for the increasing role that conservation areas are now playing, or expected to play, towards rural development in the country.

4.2 Natural resource access and use in pre-colonial Zimbabwe: pre-1890

According to Chenje et al (1998), the people who settled in what is now Zimbabwe came into the area in the later Iron Age around AD 1000. Bond (1999) estimated that the area now

called Zimbabwe contained a population of between 600 000 and 700 000 people before colonialism. The people had access to resources such as land, wildlife, and minerals and were involved in activities such as trade in ivory and gold with Arab and Portuguese traders (Chenje et al, 1998). Small grains and livestock were the main agricultural commodities and estimates indicate that there were approximately 500 000 herd of cattle in the area by 1890 (Bond, 1999).

Bouchier's description of the area as "a wilderness of bush and native timber, teeming with game of every variety which found ample feeding ground in the rich valleys and grasslands that abound in all parts of the country", indicates that the people had access to abundant natural resources (Chenje et al, 1998: 18). However, access to these resources was not uncontrolled but was limited by some traditional beliefs, taboos and customs (Chenje et al, 1998; Kwashirai, 2007; Mapedza, 2007; Muboko and Murindagomo, 2014). Pre-colonial African communities in the country were aware that unsustainable natural resource utilisation would cause environmental degradation and thus came up with various institutional prohibitions so as to foster positive societal attitudes towards the environment (Chemhuru and Masaka, 2010; Kwashirai, 2007; Mapedza, 2007). For example, some sites were believed to be hosts to some spiritual forces and it was taboo to visit these sacred sites (Chemhuru and Masaka, 2010; Mapedza, 2007). Such sites would include mountains and forests and visiting, hunting, collection of fruits, firewood and other natural products was prohibited. It was believed that anyone who visited such sites would temporarily get lost, disappear forever or become insane (Chemhuru and Masaka, 2010). While the sacredness of sites is highly debatable, it is, however, clear that such myths helped protect the natural environment as some areas remained intact nature conservation areas.

Traditional societies in pre-colonial Zimbabwe also enforced wildlife conservation by discouraging indiscriminate killing of animals and birds. It was believed that wanton killing of wildlife was punishable by the spirits and control mechanisms are found in traditional taboos, totems and customs (Chenje et al, 1998; Kwashirai, 2007; Mapedza, 2007). For example, totemism was one of the observed taboos where one was not allowed to eat their totem animal (Chemhuru and Masaka, 2010; Chenje et al, 1998; Duri and Mapara, 2007). Breaking such prohibitions was believed to invite illness or the loss of teeth by the offender (Chemhuru and Masaka, 2010). Totemism was a very effective wildlife conservation measure against extinction because different groups of people would now eat different kinds of

animals thereby avoiding the overexploitation of certain preferred species. There were also taboos forbidding the killing of young animals and females in gestation, while in some parts of the country harvesting of premature edible caterpillars was also taboo (Chenje et al, 1998). The killing of young animals, harvesting of premature edible insects, and the exploitation of resources before certain periods of the year was believed to result in loss of eyesight for the offender (Chenje et al, 1998).

There were also taboos for protecting rare or endangered animal species under immediate threat from extinction such as the python, the pangolin, and certain rare fish species (Chemhuru and Masaka, 2010; Chenje et al, 1998). For example, society believed that if one killed a python rain would not fall and therefore it became a protected species as killing it was now associated with the occurrence of drought (Chemhuru and Masaka, 2010).The killing of such rare species could only be done with the approval of the chief (Chenje et al, 1998).

There were also some traditional taboos restricting the cutting and using of certain types of vegetation. For example, indigenous fruit trees such as Muzhanje (*vapaka kirkiana*), Mutamba (*strychnos species*), Mutohwe *(azanza garkaena*), and Munhengeni (*ximena*), among others, could not be used as firewood (Chemhuru and Masaka, 2010; Kwashirai, 2007; Mapedza, 2007). As a way of discouraging people from using these trees as firewood, the trees were said not to burn properly, did not last in the fire and produced a lot of chocking smoke (Chemhuru and Masaka, 2010). Such explanations were merely meant to protect these trees so as to ensure a continuous supply of fruit that were an important part of the people's diet (Chemhuru and Masaka, 2010; Duri and Mapara, 2007). Some trees such as Muhacha (*parinari curatellifolia*) were nutritionally and culturally significant (Chemhuru and Masaka, 2010; Kwashirai, 2007; Mapedza, 2007). The fruit of the tree was important for both animals and humans especially during droughts while rain-making ceremonies were also performed under it, and thus cutting it was strictly forbidden (Chemhuru and Masaka, 2010).

The above, and other traditional taboos and customs enabled the people in pre-colonial Zimbabwe to live in harmony with nature by maintaining a healthy balance between them and their environment (Chenje et al, 1998). Chenje et al (1998) further state that these people were not only close to but part of nature, acknowledging that their very existence depended on it. For this reason, no single major environmental challenge has been reported by any researcher to date in Zimbabwe during this period.

4.3 Natural resource access and use in the colonial period

The advent of colonialism in the last decade of the 19th century in Zimbabwe severely disrupted the harmony and close ties that had existed between the indigenous people and nature (Chenje et al, 1998; Kwashirai, 2007; Mapedza, 2007; Muboko and Murindagomo, 2014). The white colonialists saw the indigenous populations as "a bunch of ignoramuses" who feared nature and thus failed to tame it for their benefit (Mapara, 2009: 148).

The newly established colonial administration soon introduced protective and command type natural resource and wildlife legislation in order to preserve once plentiful wildlife populations which had been severely decimated by the great rinderpest epidemic of 1896-1897 combined with exploitation by slave traders, hunter explorers, prospectors and adventurers (Bond and Cumming, 2006; Child, 2009a). For example, the 1893 Game Law Amendment Ordinance made it illegal to sell, barter or hawk game without a licence (Chenje et al, 1998, Child, 2009a). Different licences were required for killing, catching, pursuing, hunting or shooting game with each licence costing three pounds (Chenje et al, 1998). What this meant is that the local people could no longer hunt as in the past as they could not afford the high licence charges which were virtually unaffordable to them (Roe et al, 2009).

The Game Law Amendment Ordinance was replaced by the 1929 Game and Fish Preservation Act which gave the governor of Southern Rhodesia (now Zimbabwe) sweeping powers to control the exploitation of wildlife (Bond and Cumming, 2006; Chenje et al, 1998). The law also provided for the establishment of Wankie Game Reserve (now Hwange National Park), Vitoria Falls Reserve, Matobo (now Matoposi) National Park and Urungwe (now Hurungwe) Game Reserve which set the foundation for the current system of protected areas in the country that now covers approximately 12% of the country's total land area (Bond and Cumming, 2006; Chenje et al, 1998; Child, 2009a; Muboko and Murindagomo, 2014). Hunting for game was banned in the newly created protected areas and indigenous populations living adjacent to these areas could no longer hunt for sustenance as hunting became poaching (Chenje et al, 1998). The Game and Fish Preservation Act was amended in 1938 in tune with the 1933 International Convention for the Protection of the Fauna and Flora of Africa which made additional provisions to control trade in wildlife products and the movement of trophies (Bond and Cumming, 2006).

While the above laws resulted in the recovery of wildlife populations, such population increases also threatened human settlement and commercial cattle ranching by competing for grazing and harbouring pests and diseases (Bond and Cumming, 2006; Child, 2009a). Some cattle farmers declared that they could not continue 'farming in a zoo' (Child et al., 2012; Muboko and Murindagomo, 2014). Consequently, large-scale hunting to eradicate large mammals for the control of the spread of tsetse fly and diseases was introduced in 1920 and continued through to the 1960s (Bond and Cumming, 2006; Child, 2009a; Child et al, 2012). Approximately 690 000 wild animals were destroyed between 1919 and 1960 in this exercise (Bond, 1999; Muboko and Murindagomo, 2014).

Perhaps the most influential land use planning and administrative intervention that disposed and alienated indigenous people in colonial Zimbabwe from the natural resources they had always enjoyed was the Land Apportionment Act of 1930 (Bradley and McNamara, 1993; Chenje et al, 1998; Mombeshora and Le Bel, 2009; Muboko and Murindagomo, 2014). The Act divided all the land into European areas, African native reserves and other areas. While the settlers could hold land in the reserves, the Act prohibited Africans from holding or occupying land in the European areas (Chenje et al, 1998). The gradual implementation of the Land Apportionment Act eventually led to the emergence of a landholding structure where only 4 800 large-scale white commercial farmers occupied 11.2 million hectares of land while one million communal-area families occupied only 16.3 million hectares (Chenje et al, 1998). In addition, 74% of the native reserves or communal lands were located in the marginal agricultural areas of agro-ecological regions IV and V while the white commercial farmers were mainly allocated land in the prime agricultural areas in agro-ecological regions I, II and III (Chenje et al, 1998). Table 4.1 summarises the main features of the farming sub-sectors in Zimbabwe which came about as a result of the Land Apportionment Act of 1930. While on average the large-scale commercial farmer held 2 200ha, the communal farmer had an average landholding of 16.3 ha (Chenje et al, 1998). However, increasing population pressure in the communal areas led to a further fragmentation of the land. For example, a 1989 survey established that 70% of communal households had access to only 2.5 ha of arable land with the remaining 30% having less than 1,5 ha (Chenje et al, 1998).

Table 4.1: Major features of Zimbabwe's farming sub-sectors, 1980

	Communal	Resettlement	SSC	LSC (Priv.)	LSC (Gov.)
Number of farms	1 000 000	56 794	8 500	4 832	55
Total land area (million ha)	16.34	3.29	1.38	10.74	
Share of total agric. land (%)	50.8	10.2	4.3	33.4	
Average farm size (ha)	18	58	162	2 224	
% of land in Natural Regions					
I and II	9	19	19	35	4
III	17	38	35	22	32
IV and V	74	43	46	43	64

SSC = Small-scale commercial; LSC = Large-scale commercial

Sources: Chenje et al (1998: 156); Zimstat (2010: 21)

Legislative controls were also established so as to govern use of natural resources in the native reserves or communal areas. The 1928 Native Reserves Forest Produce Act restricted access to forest products for native reserve residents to own use only (Mapedza, 2007; Scoones and Matose, 1993). The sale of forest products was only allowed through the issuing of a permit. Movement of forest products between communal lands was also restricted (Scoones and Matose, 1993). Native reserve residents were also prohibited from exploiting protected forest areas within their lands (Kwashirai, 2007; Mapedza, 2007; Scoones and Matose, 1993). The Native Reserves Forest Produce Act also prohibited Africans from exploiting reserved tree species in their lands (Bond 1999; Chitsike, 2000; Scoones and Matose, 1993). In addition, the Act prohibited natives from using forests within their lands where commercial licences had been granted to concessionaires (obviously white) for the extraction of timber for commercial purposes (Bond, 1999; Kwashirai, 2007). The Native Reserves Forest Produce Act thus made it very difficult, if not impossible, for indigenous Africans to use woodland resources in the reserves. It is important to note that most of the restricted tree species included important fruit and agro-forestry species (Bond, 1999). While a strict regulatory framework for natural resource use was imposed on the African population through the Native Reserves Forest Produce Act, on the contrary, voluntary regulation was encouraged in the white farming areas mainly through the Forest Act of 1948 (Kwashirai, 2007; Mapedza, 2007; Scoones and Matose, 1993). These acts reflected the prevailing ideology of racially determined legislative controls (Scoones and Matose, 1993).

The period 1960 to 1980 witnessed some major changes in the perception of wildlife in Southern Rhodesia (now Zimbabwe) (Bond and Cumming, 2006). For example, there was a growing international interest in wildlife as a source of protein in Africa which contrasted sharply with colonial policies of wasteful slaughter of large numbers of wildlife on cattle ranges and in tsetse control operations (Bond and Cumming, 2006). On the other hand, taking advantage of the rising international interest in African wildlife and a rising demand for wildlife products and tourism, the private sector increasingly demanded control over wildlife (Nelson and Agrawal, 2008; Bond and Cumming, 2006). Such mounting tensions over wildlife resulted in the re-examination of wildlife management and conservation in the country culminating in the development and promulgation of the Parks and Wildlife Act of 1975 which devolved responsibility for wildlife to the private landowner (Bond and Cumming, 2006; Child, 2009b; Frost and Bond, 2008; Muboko and Murindagomo, 2014; Murombedzi, 2010). According to Duffy (2000), the granting of Appropriate Authority to the private sector was also intended to solve three other pressing concerns in the wildlife sector. First, there was a realisation that wildlife populations within some protected areas were increasingly becoming isolated as migration routes had been severed, while other protected areas were being affected by degradation due to the overpopulation of certain wildlife species, particularly elephants. Second, the transfer of wildlife responsibility would ease pressure on dwindling budgets for wildlife. The weakening financial situation in the Parks Department acted as a major impetus for transferring wildlife to the private sector as the Department failed to attract the required sums of money from central treasury for it to effectively manage the country's wildlife in the face of spiralling conservation costs. Third, wildlife was becoming more and more subject to personal interests and power struggles in the government and involving the private sector would help ease such tensions (Duffy, 2000). The major provisions of the Parks and Wildlife Act were (Bond and Cumming, 2006: 481):

- to confer on land holders and occupiers of alienated land the responsibility for the management and use of wildlife on their land;
- to extend the definition of wildlife to include all indigenous plants and animals, both vertebrate and invertebrate;
- to allow landowners and occupiers to invoke legislation to provide additional protection to wildlife on their land; and
- to provide for the creation of special conservation areas outside of the nationally administered parks and wildlife estates.

The Parks and Wildlife Act, however, did not confer ownership of wildlife on landowners. The predominant legal code in southern Africa is Roman Dutch Law where the legal status of wildlife is *res nullius,* meaning that wildlife belongs to no one (Bond and Cumming, 2006; Child, 2009b). One can only own an animal after confining, capturing or killing it and also can only have the right to use an animal while it is on their land (Bond and Cumming, 2006). The Act therefore only gave incentives for landowners to manage and benefit from wildlife resources on their land without having to seek government permission (Bond and Cumming, 2006). In fact, there were sufficient safeguards to check on wildlife abuses by the landowners through the Natural Resources Act of 1941 which had already established Intensive Conservation Area Committees (Bond and Cumming, 2006; Child, 2009a).

The Parks and Wildlife Act laid the foundation for the initial and subsequent development of the wildlife industry in Zimbabwe. According to Cumming Bond and Cumming (2006), it was not until some wildlife ranches diversified into commercial safari hunting that wildlife became a viable alternative to beef production.

Unfortunately, the Appropriate Authority for managing and utilising wildlife conferred to private landowners through the Parks and Wildlife Act was not extended to the communal areas (Bond, 1999; Bond and Cumming, 2006; Scoones and Matose, 1993). Instead, the Act allowed for the devolution of Appropriate Authority for wildlife in the communal lands to a designated officer, the Secretary for Internal Affairs responsible for administering communal lands, who delegated it to the District Commissioners (Bond, 1999). This meant that indigenous Africans in the communal lands remained with no access to natural resources in their lands in stark contrast to private owners of land who could now freely utilise wildlife resources on their lands.

Perhaps the only major attempt towards allowing indigenous Africans in the communal lands to use and benefit from natural resources during colonialism was the Wildlife Industries New Development for All (WINDFALL) project in the late 1970s (Bond and Cumming, 2006; Muboko and Murindagomo, 2014; Murombedzi, 2010). The primary objective of WINDFALL was to model the success registered in commercial wildlife ranching to communal areas and to reduce human-wildlife conflicts that were becoming pandemic (Muboko and Murindagomo, 2014). Under WINDFALL, meat was returned to surrounding villages from elephant culling. The experimental project failed mainly because of local community marginalisation, ambiguity, negative perceptions and retention of revenue by

government agencies including the Department of National Parks and Wildlife Management (DNPWLM) and Rural District Councils (RDCs) (Bond and Cumming, 2006; Muboko and Murindagomo, 2014). The collapse of WINDFALL led to a reassessment of approaches to community involvement in wildlife management culminating in the development of the CAMPFIRE programme in 1989 discussed later in the chapter (Diaw et al, 2008; Gandiwa et al, 2013).

The colonial period in Zimbabwe resulted in the loss of access to natural resources by indigenous African communities who had depended on these for centuries for their sustenance. Colonialism also disrupted the sustainable traditional natural resource utilisation institutions that the Africans had developed over a long period of time. Additionally, settler actions such as the decimation of large numbers of wild animals considered as pests and the opening up of large tracts of land for agriculture, mining and settlement set the foundation for the socio-economic and ecological challenges the country is facing today.

4.4 Natural resource access and use in the first two decades after independence: 1980-2000

This section explores natural resource access and use during the first two decades of independence in Zimbabwe. In particular, it looks at the land question, wildlife conservation and use on private land, and wildlife conservation and utilisation in the communal areas.

4.4.1 Land

The relevance of discussing the land issue in this chapter lies in the fact that anyone who controls or owns the land will automatically have access, control or ownership over all the other resources found on the land, biodiversity included. The protracted liberation struggle that led to Zimbabwe's independence in 1980 was rooted in redressing colonial land expropriation and broader societal injustices introduced by successive colonial governments (Chavunduka and Bromley, 2013; Deininger et al, 2004; Moyo, 2006; Waeterloos and Rutherford, 2004). The post-independence government inherited a land tenure system comprising three main tenure forms (Chimhowu and Hulme, 2006; Wels, 2003):

- state land, which comprised mainly national parks and state forests
- communal areas, which were formerly known as Tribal Trust Lands or native reserves

- commercial land consisting of large scale commercial farms, mainly white, and small-scale commercial farms, mainly black, and formerly known as African Purchase Areas

Expectations were high among indigenous Africans at independence that the land issue would finally be settled in a just way, restoring the reciprocal relationship between the land and the people that had existed before colonialism (Chimhowu and Hulme, 2006; Wels, 2003). However, considering that land was the major motivation for the liberation struggle, nothing much happened in this regard after independence in the 1980s (Clover and Eriksen, 2009; Moyo, 2006; Wels, 2003). Shortly after independence in 1980, Zimbabwe introduced a series of agrarian reform measures which, however, were restrained by the Lancaster House Agreement which resulted in a major compromise by the liberation movements (Clover and Eriksen, 2009; Deininger et al, 2004; Waeterloos and Rutherford, 2004; Wels, 2003). The Lancaster House Agreement of 1979 contained two important stipulations which hindered a radical land reform programme after 1980: first, that all land acquired by government be purchased on a 'willing-buyer-willing-seller' basis and secondly, that owners of any land seized by the government must be compensated in foreign currency (Chimhowu and Hulme, 2006; Deininger et al, 2004; Wels, 2003). Thus, the Lancaster House Constitution was instrumental in restraining land acquisition throughout the first decade of independence constitutionally and financially (Moyo, 2006; Wels, 2003).

In spite of the above institutional and financial constraints to land redistribution, the new government set up an ambitious resettlement programme. In 1980, a target was set to resettle 18 000 families on 1.1 million ha of acquired commercial farmland over a three-year period, later revised upwards with a new ambition to resettle 162 000 families on 9 million ha of land (Deininger et al, 2004; Wels, 2003). However, only 36 000 people were resettled on 2.46 million ha of land by 1985 (Wels, 2003). Between 1981 and 1991, the yearly average of resettled farms was 4 800 which was only a third of the target of 15 000 a year set in 1985 (Wels, 2003). In 1988 the government reduced its land acquisition budget by more than 50% from Z$11 million in 1987 to Z$4 million in 1988 (Wels, 2003).

During the 1980s, most of the land acquired through the market was agro-ecologically marginal while the bulk of the prime land in agro-ecological regions I and II remained untouched (Clover and Eriksen, 2009). In addition, the land offered to the state was geographically scattered making it very expensive to move small groups of settlers to isolated

farms (Clover and Eriksen, 2009). Moreover, the newly resettled farmers were not given security of tenure. The state retained ownership of land and controlled it through the issuing of permits for usufruct (Wels, 2003). It is not surprising therefore that at the end of the 1980s the whole land resettlement programme had lost much of its initial enthusiasm and reputation (Wels, 2003).

With the expiry of the Lancaster House Agreement in 1990, hopes were high that new opportunities could now be secured for a more equitable distribution of land in Zimbabwe. In 1992, government enacted the Land Acquisition Act to speed up the process (Clover and Eriksen, 2009; Waeterloos and Rutherford, 2004; Wels, 2003). The Land Acquisition Act of 1992 provided the legislative machinery for the second phase of land reform and resettlement in Zimbabwe (Waeterloos and Rutherford, 2004). Under this new Act the President was given powers to compulsorily acquire (Land Acquisition Act 1992, Chapter 20:10 cited in Wels, 2003:73-74):

a) any land where the acquisition is reasonably necessary in the interest of defence, public safety, public order, public morality, public health, town and country planning or the utilisation of that or any other property for a purpose beneficial to the public generally or to any section of the public
b) any rural land, where the acquisition is reasonably necessary for the utilisation of that or any other land:
   i) for settlement for agricultural purposes; or
   ii) for purposes of land reorganisation, forestry, environmental conservation or the utilisation of wildlife or other natural resources; or
   iii) for the relocation of persons dispossessed in consequence of the utilisation of land for the purpose referred to in subparagraph (i) and (ii)

Despite the introduction of the Act, progress in land acquisition and redistribution was surprisingly slow (Clover and Eriksen, 2009). According to Wels (2003), between 1992 and 1997, only 100 farms were designated. The adoption of the structural adjustment programme for macroeconomic reforms in the country during this period also delayed substantive land redistribution, and it was only in the face of rising popular demands for land and political pressure from various interest groups that the government officially launched the second phase of land reform in September 1998 (Waeterloos and Rutherford, 2004). In 1997, basing on the Land Acquisition Act, the Zimbabwe government published a list of 1471 large farms

for possible compulsory acquisition (Deininger et al, 2004; Moyo, 2006; Wels, 2003). However, government could not acquire the land due to financial constraints. Most of the farms were delisted as the government, donors and large-scale commercial farmers sought a negotiated framework culminating in the donors' conference in September 1998 (Moyo, 2006). However, the conference was a disappointment for government as only Z$17 million was realised out of the expected Z$21.6 billion (Moyo, 2006; Wels, 2003). The donors withheld their funding citing lack of transparency in the land designation process, echoing an earlier UNDP Report which had also labelled the land designation exercise as biased (Wels, 2003). In addition, a constitutional referendum in February 2000, which could have facilitated a speedier governmental land acquisition was rejected by the people (Moyo, 2006).

By 2000, after 20 years of land reform effort by government, whites who made up 1% of the population owned 28% of all land in Zimbabwe and accounted for 60% of the country's exports (Clover and Eriksen, 2009). Only 71 000 households had been resettled by 2000 against an original target of 162 000 households (Clover and Eriksen, 2009; Moyo, 2006). This shows that land reform efforts in the first two decades after independence in Zimbabwe were a dismal failure as the colonial status quo was virtually maintained.

4.4.2 Private wildlife conservation and use

The passing of the Parks and Wildlife Act of 1975, which devolved appropriate authority over wildlife to land owners, laid the foundation for private wildlife conservation in Zimbabwe. Unlike many other African states which have, until recently, mainly focused their efforts on state protected areas, a major component of Zimbabwe's policy on sustainable wildlife utilisation is the conservation of wildlife on land outside national parks (Child, 2009b; Duffy, 2000; Lindsey et al, 2009). While the government remains responsible for wildlife within the Parks and Wildlife Estate, wildlife conservation has increasingly been transferred to the private sector since the 1970s through policies that encourage the devolution of authority and responsibility for wildlife to the landholder, coupled with the definition of wildlife as an economic resource (Duffy, 2000).

Though the roots of private wildlife ranching in Zimbabwe can be traced back to the 1970s, its real growth and establishment was experienced after independence particularly in the 1980s up to the late 1990s. While security of tenure, which remained guaranteed after independence through the Lancaster House Agreement, was a necessary condition for the

management of wildlife by farms in the large-scale commercial farming sector, it was not a sufficient factor for the successful establishment of the wildlife industry (Bond and Cumming, 2006). Changing macro-economic conditions and the growth in live game sales and tourism in the 1990s improved the incentive structure for wildlife which saw many farms increasingly allocating resources to the management of wildlife (Bond and Cumming, 2006; Child, 2009b; Wolmer et al, 2004). A decline in beef prices and severe drought in the early 1990s, coupled with the collapse of the Zimbabwean dollar and a broader shift towards export-oriented agriculture, also greatly increased the popularity of game ranching (Wolmer et al, 2004).

In addition, a research programme in the 1980s and 90s coordinated by the WWF on multi-species systems of animal production revealed highly favourable comparisons of the wildlife industry's prospects with those of beef production (Child, 2009b; Lindsey et al, 2009; Wolmer et al, 2004). The average financial return on investment of wildlife enterprises was 10% for Natural Regions III and IV while it exceeded 10% for Natural Region V (Bond and Cumming, 2006; Child, 2009b). In contrast, the average return on investment to cattle was below 5% in all natural regions against a 10% level considered profitable by the survey (Bond and Cumming, 2006). The significant changes in land use, where ranchers destocked cattle in favour of wildlife during the period 1990 to 2000, fully substantiated the results of the WWF survey (Bond and Cumming, 2006; Lindsey et al, 2009; Nelson, 2010). A further indicator of the relative viability of wildlife over livestock production systems was the formation of wildlife conservancies such as the Save Valley, Bubiana and Chiredzi River (Lindsey et al, 2009; Muboko and Murindagomo, 2014; Wolmer et al, 2004). Economic and ecological arguments were cited in support of the establishment of these large properties for managing and utilising wildlife (Bond and Cumming, 2006; Wolmer et al, 2004). The large conservancies would enhance viability through economies of scale and in terms of sustainable carrying capacities that would more efficiently exploit the foreign exchange raising potential of wildlife through hunting and ecotourism (Lindsey, 2009; Wolmer et al, 2004). Ecologically, wildlife species were better adapted to the dry environments and thus were more resilient in times of drought, while the mixture of browser and grazer wildlife translated into a higher carrying capacity for the conservancies hence higher productivity (Wolmer et al, 2004). By 1994 wildlife ranching was one of the fastest growing new uses of commercial farmland in Zimbabwe (Wolmer et al, 2004).

By 1997, a robust and diversified wildlife sector emerged in Zimbabwe under three broad subsectors (Bond and Cumming, 2006; Child, 2009b; Feresu, 2010), namely:

- extensive multi-species production systems where properties were converted from extensive cattle ranching systems to large conservancies where safari hunting is the main source of income
- intensive to semi-extensive multi-species production systems where game farming occurs in enclosed areas and the animals produced may be part of an ecotourism venture that complements farming activity
- intensive single species production systems for example where crocodile (*crocodylus niloticus*) and ostrich (*struthio camelus*) are produced in captivity for their leather with meat as a by-product
- non-commercial, where land owners tolerate a limited range of wild animals on their property with limited off-take for home consumption

Prior to 2000, there were 669 game farms and conservancies registered with the Wildlife Producers Association of Zimbabwe with a combined area of 2.5 million hectares and constituting at least 20% of the country's commercial farmland (about 5% of the country) (Feresu, 2010).

The rapid growth and establishment of the private conservation sector, particularly after independence, was an important development for the Parks and Wildlife Department for both economic and political reasons (Duffy, 2000). As shown earlier, it became increasingly clear in the 1980s that conservation budgets were no longer able to keep pace with spiralling conservation costs and hence wildlife conservation on private lands presented itself as an effective cost-saving management plan (Duffy, 2000). In addition, the giving away of some control over wildlife to private individuals and groups was a political move by the Parks Department to prevent the growing corrupt use of wildlife by certain elements in the Department, Ministry of Environment and Tourism and in government (Duffy, 2000).

The development of private conservancies and game ranching in the large-scale commercial farming sector was, however, criticised for perpetuating the existing unequal distribution of land and economic power (Child, 2009b; Duffy, 2000; Wolmer et al, 2004). Political and historical factors saw white commercial farmers becoming the main beneficiaries of the development of the conservancies and game ranches due to colonial policies which reserved

the best land for European Areas (Duffy, 2000). For government officials, separating overpopulated poor communal areas by electric fences from relatively empty game ranches was politically, economically and morally unacceptable (Wolmer et al, 2004). Additionally, there was no regulatory framework for the rapidly growing conservancies and thus they were viewed as attempts by white commercial farmers to hide and privatise a national resource, with some in government viewing this as a move to challenge statal control over wildlife (Wolmer et al, 2004).

In addition, the economic motivation that saw large-scale white commercial farmers switching to wildlife from cattle was also problematic (Duffy, 2000). This was because, the same financial considerations (and not conservation objectives) that first attracted cattle rangers to wildlife farming could also be used in moving away from wildlife conservation and back to cattle or any other profitable form of land use if wildlife became unprofitable (Duffy, 2000). It is important to note that tourism is a very sensitive industry which can easily be affected by issues such as regional or national strife, changes in holidaying tastes, and income increases in air fares and this can adversely affect any activity based on it including wildlife ranching (Duffy, 2000; Jalani, 2012; Leisher et al, 2010; Youdelis, 2013). For this reason, some elements in government treated the transfer of appropriate authority over wildlife to private landowners with caution (Duffy, 2000).

The expiry of the Lancaster House Agreement in 1990, and the subsequent enactment of the Land Acquisition Act in 1992, presented a major threat to wildlife ranches and conservancies as government could now easily and compulsorily acquire any land for resettlement (Wels, 2003). In 1995, the then Minister of Environment and Tourism, Chenhamo Chimutengnde, stated that conservancies had to be closely monitored in order to prevent them from threatening food security as they were developing in areas suitable for both commercial and subsistence crop production (Duffy, 2000; Wolmer et al, 2004). This was followed in the same year by a similar statement from the then Deputy Minister of Lands and Water Resources, Cain Mathema, pledging to curb the expansion of game farming as it threatened to swallow up the country's crop lands (Duffy, 2000).

In response to the apparent and growing threat to their survival, game ranchers attempted various survival strategies. Recognising that failure to indigenise will ultimately threaten their long-term survival, the white commercial wildlife ranchers tried to attract black entrepreneurs into their ventures (Duffy, 2000). In a move to gain some political and social legitimacy,

others responded with some 'community trust' and 'neighbour outreach schemes' through activities such as, *inter alia*, borehole drilling, school fee hand-outs, and access to sacred areas for the neighbouring communities (Wolmer et al, 2004). However, in spite of such moves, wildlife continued to be perceived by the wider Zimbabwean society as a white-controlled area of the economy (Child, 2009b; Duffy, 2000; Wolmer et al, 2004). The neighbour outreach schemes were criticised as cosmetic attempts to maintain the status quo or as 'strategic tokenism' for attracting donor funding (Wolmer et al, 2004).

So, prior to the fast-track land reform programme in 2000, game farms and conservancies as a conservation policy were viewed by many in government as a hangover from the colonial period perpetuating a racially unequal distribution of land and resources. Despite the above controversies surrounding private wildlife ranching in Zimbabwe, it is clear that a switch to wildlife farming proved to be quite successful both as a profitable form of land use and as a tool for the effective conservation of wildlife resources in the country. The neighbour outreach schemes by private conservancies have also relatively contributed to some form of rural development in various parts of the country.

4.4.3 Incentives for wildlife as a land use in the communal farming sector: CAMPFIRE

In parallel with the politically controversial development of game ranching on large-scale commercial farms, there have been attempts by the state, since colonial times, to disburse wildlife revenue and devolve authority to local communities in the communal areas (Frost and Bond, 2008; Muboko and Murindagomo, 2014; Murombedzi, 2010; Wolmer et al, 2004). This eventually culminated in the now world-renowned CAMPFIRE programme explored below.

4.4.3.1 Historical background, objectives and principles of CAMPFIRE

The concept of CAMPFIRE has its origins in the 1970s with schemes that tried to emulate successes with the use of wildlife on large-scale commercial farms (Frost and Bond, 2008; Scoones and Matose, 2003; Taylor, 2009). In the 1970s, as shown earlier, the Department of National Parks developed and implemented operation WINDFALL, which returned benefits from elephant culling in the newly established Chirisa Safari Area to the surrounding communities (Frost and Bond, 2008; Olthof, 1995; Murombedzi, 2010). However, operation WINDFALL failed in the communal areas because, unlike on private farms, revenue could not accrue locally and was diverted to central government (Murombedzi, 2010; Mutandwa

and Gadzirayi, 2007; Scoones and Matose, 2003; Taylor, 2009). The initiative did not propose new tenure arrangements regarding the wildlife resources, and shared the financial revenues from safari hunting with district authorities and not their constituent village-level communities (Murombedzi, 2010). It was a top-down programme without the participation of the people in areas with wildlife, with all decisions coming from government agencies (Gandiwa et al, 2013; Murombedzi, 2010; Olthof, 1995). CAMPFIRE was born out of the Sebungwe regional planning exercise in the early 1980s after a realisation that the development of the Sebungwe area (Binga, Gokwe and Kariba Districts) would have to be based on wildlife utilisation as much of the region is not suitable for arable agriculture (Olthof, 1995).

The legal mechanisms through which CAMPFIRE now operates was the granting of appropriate authority to District Councils through the amendment of the Parks and Wildlife Act (1975) in 1982 (Bond, 2001; Frost and Bond, 2008; Murombedzi, 2010). This allows revenues derived from wildlife, through safari operators, hunting concessions and trophy fees, to be accrued by the Council rather than being diverted to central treasury, which in turn increases incentives for councils to invest in wildlife-based revenue-earning activities. The gross wildlife revenue received by district councils is allocated to wildlife management activities, district council levies, and to wildlife producer wards (Bond, 2001). While there is a considerable variance concerning wildlife management activities between districts, most have a small core of personnel whose duties involve law enforcement, problem animal control (PAC) and wildlife monitoring (Bond, 2001). The revenue devolved to sub-district levels, mostly to wards, provides the financial incentive for individuals and households to participate in the common management of wildlife (Bond, 1999; Bond, 2001; Taylor, 2009). Figure 4.3 summarises the CAMPFIRE financial model. It was hoped that devolution of appropriate authority would eventually be extended to wards and finally villages, but there are no legal mechanisms to allow this as yet (Duffy, 2000).

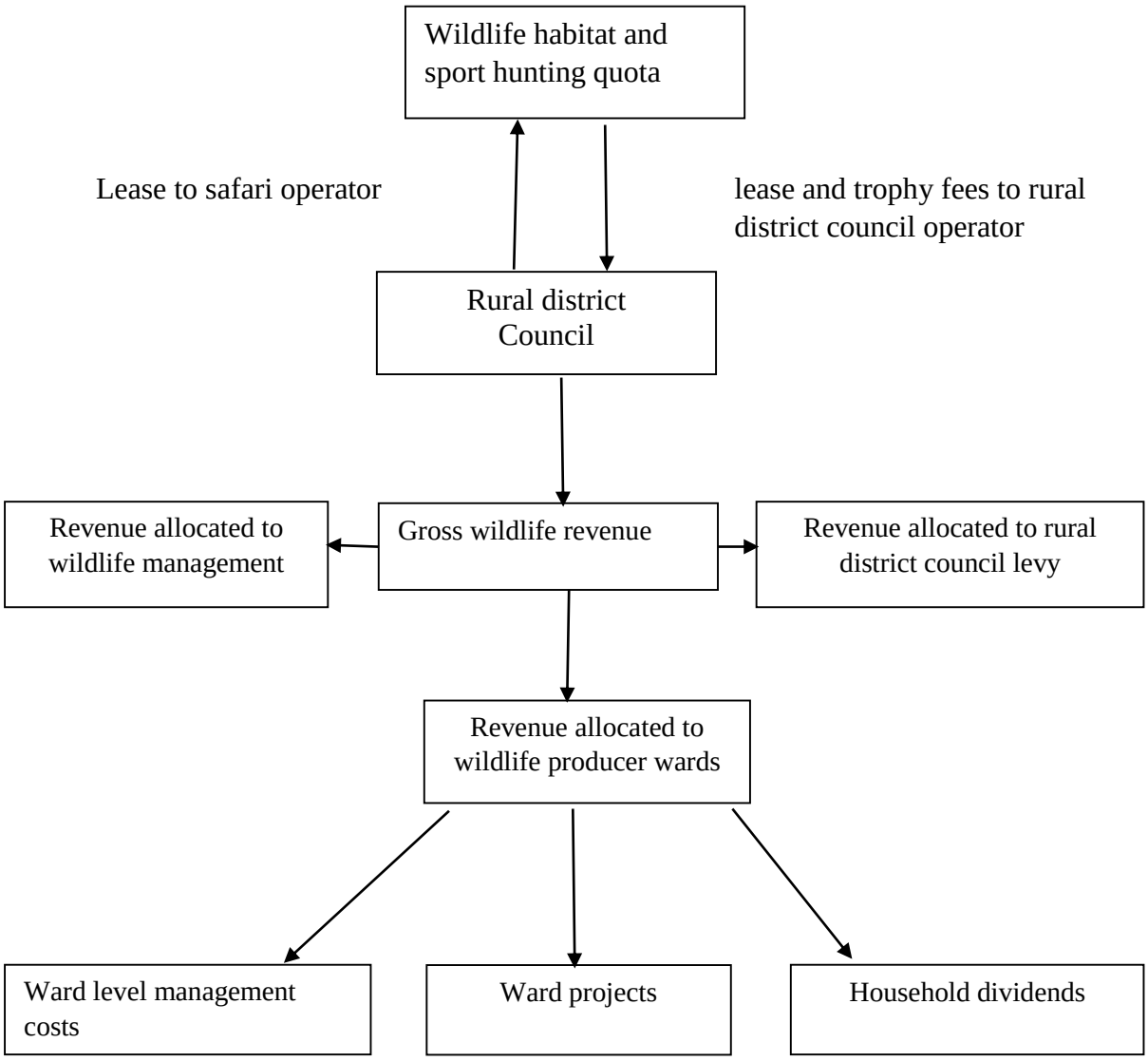

Figure 4.3: The CAMPFIRE financial model
Source: Bond (2001: 229)

While the initial project proposals for CAMPFIRE were written and accepted in 1982, the programme only started in 1989 (Olthof, 1995). The delay was due to the reluctance of the Ministry of Natural Resources to grant appropriate authority before the setting up of convincing management structures by District Councils while, on the other hand, Councils were hesitant to set up such structures before the granting of appropriate authority (Bond and Cumming, 2006; Olthof, 1995). Towards the end of 1988 the first two District Councils, Nyaminyami and Guruve, obtained appropriate authority status (Duffy, 2000; Olthof, 1995), with the Mahenye CAMPFIRE project in Chipinge District following soon after these first two areas (Mashinya, 2007). Since then, the number of districts with appropriate authority to manage wildlife has been growing rapidly and by 1992 twelve districts had been granted appropriate authority status (Olthof, 1995), while by the end of 1998, 36 of the country's 56

districts had been granted appropriate authority (Mashinya, 2007). While currently 54 of the country's 56 districts now have appropriate authority (Feresu, 2010), only 14 of these districts have been consistently earning revenue from CAMPFIRE since 2000 (Mashinya, 2007). Lack of sufficient wildlife populations to support revenue generating activities such as trophy hunting or ecotourism has hampered the successful establishment and development of CAMPFIRE in many districts (Mashinya, 2007). While those districts less endowed with wildlife tried different programmes based on, for example cultural tourism, natural scenery, bird watching, bee keeping among others, these take long to establish and are less likely to be economically viable compared to wildlife (Child et al, 2003; Mashinya, 2007).

CAMPFIRE aims at the sustainable utilisation of a wide range of local resources by combining conservation, local resource management, community empowerment, and development (Frost and Bond, 2008; Murombedzi, 2010; Olthof, 1995; Taylor, 2009). It aims to remove the conflict between environment and development through sustainable resource use, based on a safe minimum standard offtake, in order to ensure long-term satisfaction of basic human needs (Duffy, 2000; Taylor, 2009). It is also informed by the idea that poverty is a major cause and effect of environmental degradation (Duffy, 2000). The central tenet of CAMPFIRE is that in contrast to colonial-style 'fortress conservation', there should be no conflict between the economic survival of rural agricultural communities and foraging needs of wildlife but rather these should complement each other (Wolmer et al, 2004). According to Martin (1986: 17), the objectives of CAMPFIRE are to:

- obtain the voluntary participation of communities in a flexible programme which incorporates long-term solutions to resource problems;
- introduce a new system of group ownership and territorial rights to natural resources for the communities resident in the target areas;
- provide the appropriate institutions under which resources can be legitimately managed and exploited by the resident communities for their direct benefit; and
- provide technical and financial assistance to communities which join the programme so as to enable them to realise these objectives.

In order to ensure a successful achievement of the above objectives, a number of important CAMPFIRE principles have evolved over the years, core of which include the following (Olthof, 1995: 114-116):

- *The identification of producer communities, that is, communities living with a natural resource (such as wildlife), including the costs and therefore qualify to receive the benefits as well*. Small and homogenous communities have been found to be better able to successfully manage common property resources.
- *A direct link between the degree of involvement and the amount of benefits a community receives*. Communities with more game bear higher costs in terms of crop damages, livestock losses, costs of preventing these losses, and the opportunity costs of assigning land to wildlife and these should therefore receive higher benefits.
- *Support for participatory structures in decision making and resource management*. Under CAMPFIRE various committees have been established including District Wildlife Committees, Ward Wildlife Committees and, in some cases, even Village Wildlife Committees for the coordination and management of wildlife activities such as anti-poaching programmes, the control of problem animals, and for advising on the use of wildlife benefits.
- *A choice with respect to the way benefits are spent*. Producer communities have the freedom to decide on the form and purpose of benefits accruing to them. The choice is usually between community development projects (such as schools, grinding mills etc.), household cash dividends, or a mixture of the two.
- *A conscious utilitarian approach and an acceptance of the market value of natural resources, though within bounds dictated by their sustainable use*. The DNPWLM establishes annual hunting and cropping quotas for each CAMPFIRE area which are then put out to public tender with the highest bidder gaining the right to organise hunting safaris in the area. Values for individual species are dictated by laws of demand (safari operators, hunters) and supply (animals, trophies). Animal quotas may not be fully exploited for some smaller animals and these are then culled and their meat and hides sold. The meat is usually sold to residents of the CAMPFIRE areas at prices below the market.

The DNPWLM, initially envisaged a state-run CAMPFIRE Agency which would recruit communities, implement the preliminary stages of CAMPFIRE and then reduce its involvement in a transitional period followed by eventual take-over of programmes by communities (Duffy, 2000). However, lack of expertise and financial resources could not permit this (Duffy, 2000). The gap in finance, research and expertise was eventually filled in by a number of NGOs, in partnership with various bilateral donors, and these institutions

have been extremely crucial in the establishment and development of CAMPFIRE (Duffy, 2000; Frost and Bond, 2008). A CAMPFIRE Collaborative Group (CCG), chaired by the DNPWLM and consisting of governmental agencies and NGOs was then formed to coordinate the CAMPFIRE programme. Specifically, the CCG comprised the DNPWLM, Ministry of Local Government, Rural and Urban Development (MLGRUD), the Zimbabwe Trust (ZIMTRUST), Africa Resources Trust (ART), the University of Zimbabwe's Centre for Applied Social Sciences (CASS), WWF, and the CAMPFIRE Association (CA) (Child et al, 2003; Frost and Bond, 2008).

The main donors for the CAMPFIRE programme were the United States Agency for International Development (USAID), the Norwegian Agency for Development Cooperation and DFID, with USAID accounting for about two-thirds of this external financial support (Frost and Bond, 2008). Between 1989 and 2003, USAID spend approximately US$ 25.2 million on natural resource management in Zimbabwe, including the development of CAMPFIRE (Child et al, 2003; Frost and Bond, 2008). These funds were used for meeting project administration costs by USAID contractors (20.9% of total expenditure); community development, including infrastructure - vehicles, fencing and buildings (24.4%); development projects and institutional capacity building (12.7%); technical support for wildlife conservation (11.8%); planning and applied research (6.9%); communications and training (3.6%); and grants to the participating NGOs (19.7%) (Frost and Bond, 2008). None of these funds were, however, used in funding the basic transactions between the producer communities and safari operators (Frost and Bond, 2008).

ZIMTRUST's role in CAMPFIRE was to assist in training and institutional building and in supporting communities at ward and district level in their efforts to create the required mechanisms for them to be granted appropriate authority status by central government (Duffy, 2000; Olthof, 1995). CASS provided support for the CCG, concentrating on the sociological, planning and project implementation aspects of CAMPFIRE (Duffy, 2000). WWF-Zimbabwe has been important in terms of capital investment and provision of ecological surveys of potential and existing CAMPFIRE areas (Olthof, 1995). Finally, ART and the CA were involved in public relations. ART concentrated on international public relations and has promoted the concept of CAMPFIRE around the globe, while the CA is a representative umbrella organisation for CAMPFIRE areas articulating and promoting the interests and needs of the rural people at a national level (Duffy, 2000). However, the build-

up of political turmoil after 2000 saw most civic organisations in Zimbabwe being marginalised, including those that had been involved in CAMPFIRE (Child et al, 2003; Rihoy et al, 2010). This led to the collapse of the CCG leaving the CA in charge of a far much weakened CAMPFIRE programme (Child et al, 2003).

4.4.3.2 CAMPFIRE achievements

The CAMPFIRE programme has realised several remarkable achievements since its inception in 1989. Economically, total annual income from safari hunting increased rapidly from US$350 000 in 1989 to US$2 million in 2001 (Figure 4.4) (Child et al, 2003). During the same period (1989-2001), CAMPFIRE areas earned a total of US$20.3 million (Child et al, 2003; Frost and Bond, 2008; Nelson, 2010). Through the multiplier effect, this earned the country over US$ 100 million (Child et al, 2003). A significant improvement in marketing and a steady increase in hunting quotas accounted for the impressive growth in CAMPFIRE revenue during this period (Child et al, 2003; Taylor, 2009).

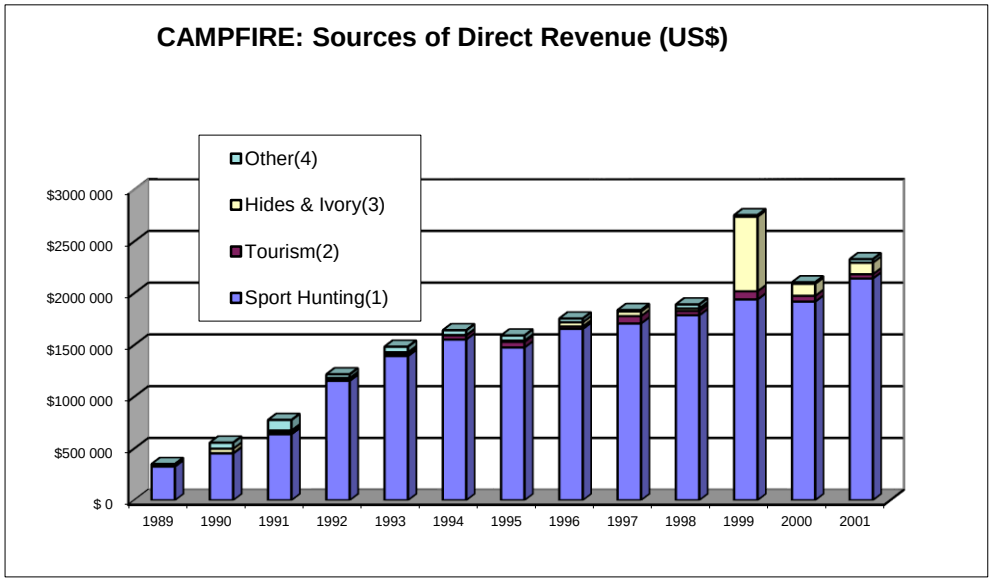

Figure 4.4: Direct income generation from CAMPFIRE, 1989-2001
Source: WWF Database, cited in Child et al (2003: 59)

Another important indicator of the economic success of CAMPFIRE has been the gross annual benefit for communities in CAMPFIRE areas (Bond and Cumming, 2006; Taylor, 2009). This increased steadily from an all-time low of 38% in 1990 up to 59% in 1995 (Figure 4.5) with revenue retained by councils declining remarkably (Child et al, 2003). However, the revenue disbursed to communities suddenly went down to less than 50% after 1996, eventually getting back to the 1990 level of 38% by 2001, with councils now retaining

around 40% of CAMPFIRE revenue thereby adversely reducing benefits to the local communities (Child et al, 2003). In spite of the decreasing trends, the revenue that was disbursed to communities from council was instrumental in funding various community development projects including the building of schools and clinics, the purchasing of grinding mills, and the sinking of boreholes among other development activities. Some of the revenue disbursed to communities was paid out as household dividends though, compared to agricultural production, the cash benefits from wildlife in most wards were merely supplementary to crop and livestock production (Bond, 1999). Only a few wards with low human population densities and endowed with higher wildlife populations produce significant annual household cash dividends (Bond and Cumming, 2006; Mutandwa and Gadzirayi, 2007).

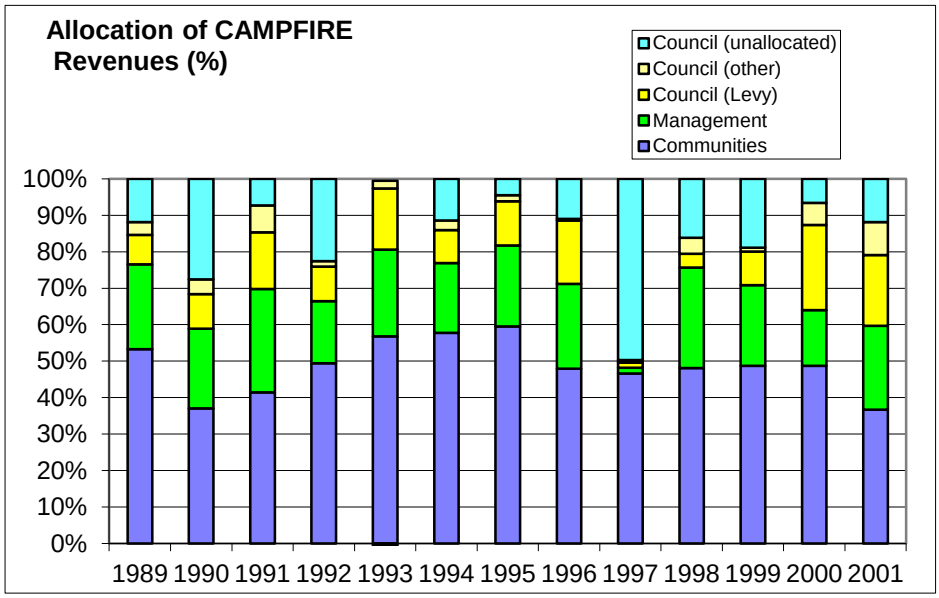

Figure 4.5: Summary of the allocation of CAMPFIRE revenues to RDCs and producer communities, 1989-2001
Source: WWF Database cited in Child et al (2003: 63)

The CAMPFIRE programme has also immensely contributed to the conservation of natural resources in Zimbabwe (Dunham et al, 2003; Mutandwa and Gadzirayi, 2007; Taylor, 2009). CAMPFIRE protects an area of land roughly equivalent in size to Zimbabwe's Parks and Wildlife Estate (Child et al, 2003). The country's protected areas comprise 12.7% of the country covering a total area of 49 700 km^2 while the total area protected by CAMPFIRE is 48 522 km^2 (Figure 4.6) (Child et al, 2003; Mombeshora and Le Bel, 2009). According to Duffy (2000), when CAMPFIRE protected areas and ranches under wildlife are added to the Parks and Wildlife Estate, the area of land under wildlife comes up to 33%. This is apparently

a major indicator of the successful impact of the CAMPFIRE programme to biodiversity conservation in Zimbabwe.

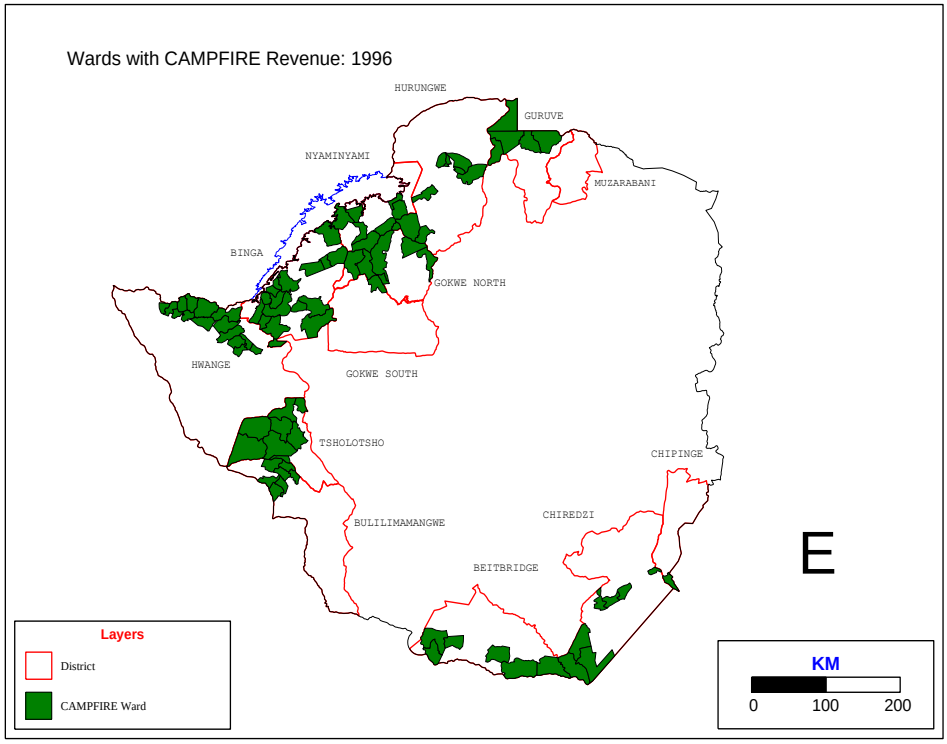

Figure 4.6: CAMPFIRE producer wards in 1996
Source: WWF Southern African Regional Programme Office Database cited in Child et al (2003: 52)

CAMPFIRE has also remarkably promoted conservation awareness through various awareness raising activities including the "formation and establishment of natural resource management committees from village to district levels; training workshops targeted at producer communities; conservation awareness among schools; and information dissemination through the print and electronic media" (Child et al, 2003: 50). Natural resource monitors and CAMPFIRE promoters have also been recruited so as to motivate communities in the management and sustainable utilisation of natural resources (Child et al, 2003). An estimated 2 400 000 copies of Action Magazine, the main vehicle for the dissemination of conservation awareness information for CAMPFIRE was distributed in six countries in Southern Africa including Zimbabwe (Child et al, 2003).

Another significant achievement of CAMPFIRE has been an institutional development programme aimed at creating new forms of communal organisation for wildlife management (Child et al, 2003; Murombedzi, 2001; Mutandwa and Gadzirayi, 2007). Such institutional

management development capacity building has been implemented mainly through the creation of village, ward and district wildlife management committees with the help of ZIMTRUST (Murombedzi, 2001; Rihoy et al, 2010). These new committees are actually sub-committees of the local government units: the Village Development Committee (VIDCO), the Ward Development Committee (WADCO) and the RDC (Duffy, 2000; Murombedzi, 2001). At the village and ward levels ZIMTRUST ran training courses on conflict resolution, confidence building and awareness raising, accountability, the link between wildlife and community livelihood needs among many other courses (Child et al, 2003). ZIMTRUST also played a key role in the establishment of CAMPFIRE committees and ensuring that they were democratically elected to represent varied interests in the villages and wards (Child et al, 2003). However, the evolving institutionalisation of wildlife management at the local level has not developed into a process for defining local rights over wildlife resources, with RDCs still wielding full control over wildlife (Murombedzi, 2001).

At the district level, CAMPFIRE helped in developing RDCs management capacities in areas such as financial management, natural resource management, devolved governance, and interaction with the private sector (Child et al, 2003). Several RDCs were recipients of grants aimed at capacity building for the effective management of CAMPFIRE activities. Even at the national level, CAMPFIRE induced some institutional changes so as to create an enabling legal and policy environment for the programme (Child et al, 2003). This saw government agencies such as the MLGRUD and the DNPWLM, in collaboration with various NGOs, becoming actively involved in the CAMPFIRE programme, though these increasingly became less active with the passage of time (Child et al, 2003; Rihoy et al, 2010).

An amazing achievement of CAMPFIRE has been its ability to curve out a high regional and international profile as the flagship community-based natural resource management programme in Southern Africa within a very short period from its inception (Child et al, 2003; Frost and Bond, 2008; Harrison et al, 2014; Mashinya, 2007; Murombedzi, 2010; Mutandwa and Gadzirayi, 2007; Nelson, 2010; Rihoy et al, 2010; Taylor, 2009;). This has been achieved by ART mainly through international information dissemination on CAMPFIRE and sustainable resource use principles; through arranged study tours in the region as well as in the USA and UK; and also through hosted visits to CAMPFIRE areas (Child et al, 2003). CAMPFIRE has been so much of a success story such that other countries in the Southern African Development Community (SADC) region such as Botswana,

Namibia, Mozambique and Zambia have adopted the programme's principles with some adaptations to suit local circumstances and institutional frameworks (Child et al, 2003; Murombedzi, 2010; Rihoy et al, 2010). Botswana and Namibia have gone further than CAMPFIRE by directly devolving rights and authority over wildlife to local communities, an area that still needs to be realised in Zimbabwe (Child et al, 2003; Chiyaka, 2003; Rihoy and Maguranyanga, 2007). Mashinya (2007) gives reference to countries further afar as Mongolia embracing the CAMPFIRE model. Indeed, CAMPFIRE can arguably be regarded as one of Zimbabwe's major international export products.

4.4.3.3 Criticism of CAMPFIRE

Despite its achievements, CAMPFIRE has also been criticised on a number of areas. The main criticism of CAMPFIRE has been its failure to devolve appropriate authority to sub-district levels. The CAMPFIRE concept was founded on the principles embodied in the 1975 Parks and Wildlife Act that had devolved authority over wildlife to large-scale freehold commercial farmers (Child et al, 2003; Nelson, 2010). Through the Act, freehold farmers and ranchers were transformed into proprietary units for wildlife with the ability to make significant management decisions including the right to hunt, to allow someone else to hunt, the right to buy and sell game, to carry out trophy hunting, and to accrue all benefits derived from these activities (Child et al, 2003; Duffy, 2000). Similarly, CAMPFIRE founding documents aimed at an institutional change that would grant residents in communal areas territorial rights over defined tracts of land; custody and responsibility over natural resources; and the right to benefit directly from the exploitation of the natural resources on their land (Martin, 1986; Nelson, 2010). CAMPFIRE was thus originally intended to be a rights-based approach that would give communal area residents significant d*e jure* control over their land and natural resources (Child et al, 2003; Chitsike, 2000) through, as Martin (1986) puts it, Natural Resource Cooperatives or Village Companies.

However, the implementation of CAMPFIRE saw a number of compromises being made, with appropriate authority for the formal control over wildlife eventually being devolved to RDCs rather than to sub-district local communities as had originally been envisaged (Frost and Bond, 2008; Harrison et al, 2014; Muboko and Murindagomo, 2014; Murphree, 2005; Nelson, 2010). There were no legal mechanisms to enable the devolution of appropriate authority to wards and villages as the RDC is the lowest recognisable legal entity (Chitsike, 2000; Duffy, 2000). The institutional context of the country's communal lands is such that

there are no community level governance institutions with rights over a defined area of land (Murphree, 2005; Nelson, 2010). Due to a pre-existing administrative system of local government, CAMPFIRE producer communities had to be represented by WADCOs and VIDCOs which unfortunately are not body cooperate as they have no legal status but are merely advisory bodies to councils (Child et al, 2003; Chitsike, 2000). The granting of appropriate authority to RDCs gives them, rather than local communities, the power to sign contracts with hunters and to accrue all the generated income. The 2002 CAMPFIRE Revenue Guidelines stipulate that: the RDC cannot keep more than 15% of the revenue to cover their overheads; RDCs may receive a maximum of 26% of revenue to be spent on wildlife management activities such as law enforcement and monitoring; the CA may receive 4% of gross revenue as a levy from councils; leaving producer communities with only 55% of gross revenue (Child et al, 2003; Duffy, 2000). The retention of such a large proportion of wildlife revenues at the district level (41% of gross revenue) represents a very large tax on wildlife activities in the communal areas which makes wildlife less profitable compared with agricultural produce and livestock which are not subject to taxation (Duffy, 2000; Murombedzi, 2001; Nelson, 2010). This has degraded the local incentive for investing in wildlife production and conservation among communal area residents considering the huge opportunity costs they incur, including damage to crops by wild animals, and has emerged as the chief critique of CAMPFIRE (Murombedzi, 2001; Nelson, 2010). The ultimate goal of CAMPFIRE is for producer communities to receive 80% of all the revenue generated with the RDCs retaining not more than 20% (Duffy, 2000), and this has not been realised as yet.

Attempts by the Parks Department in the 1990s to legislate for appropriate authority to be vested in sub-district levels have been resisted (Child et al, 2003). The MLGRUD argued that legislation gives appropriate authority to councils and these, by right, should retain this authority and the income for general development goals (Child et al, 2003; Chitsike, 2000). The recentralisation of powers and revenue to the RDC level was also partly as a result of the Economic Structural Adjustment Programme (ESAP) which resulted in budget cuts for all government departments (Duffy, 2000). Diminishing budget allocations from central government resulted in RDCs increasingly becoming unwilling to devolve appropriate authority for wildlife to producer communities (Duffy, 2000). The granting of appropriate authority over wildlife to RDCs instead of producer communities therefore represents a major structural and implementational shortfall within the CAMPFIRE concept and is indicative of the disinclination of political and economic elites to give up access and benefits that

accrue from the wildlife resources (Larson and Lewis-Mendoza, 2012; Muboko and Murindagomo, 2014; Tom, 2011). Because of limited rights to land and natural resources, communities have little discretion to determine actual resource use and only have rights to part of the revenue generated from resource exploitation by external interests, and often cannot participate in that exploitation themselves (Murombedzi, 2010). Such natural resource decentralisation reforms can best be described as 'charades' due to a lack of substantive depth of institutional reform on the ground to match the rhetoric of decentralisation, devolution and local empowerment (Nelson, 2010; Ribot, 2004; Ribot et al, 2006; Ribot, 2008). These limitations are recognised by some new regional initiatives such as recent tourism joint venture models being developed in South Africa that are based on enabling communities to gain equity at all levels of the game lodge tourism industry on the basis of secure rights to land on which game lodges are developed (Murombedzi, 2010). In another regional example, CBNRM in Botswana has witnessed a more complete devolution of the benefits from wildlife to community trusts which are recognised legal entities thereby giving communities greater leverage over the use of resources and the benefits derived from such use (Chitsike, 2000; Chiyaka, 2003; Rihoy and Maguranyanga, 2007). Namibia has also sought to extend authority over wildlife to communal lands by passing some legislative reforms in 1996 which enabled communities to form their own self-defined 'conservancies' with direct proprietorship over wildlife (Nelson, 2010).

In addition to the Parks and Wildlife Act which give appropriate authority over wildlife to RDCs instead of local communities, a number of other laws also give the RDCs, and other statal organisations, considerable control over natural resources in the communal areas. Despite a change in government from colonial rule to independence in 1980, the country's natural resource and rural development legislation remained highly top-down (Chitsike, 2000). A World Bank study edited by Bradley and McNamara (1993) highlights the implications of these Acts on sustainable development in the communal areas and the observations below are largely drawn from this study:

The Communal Land Act of 1982 (amended in 1985) superseded the Tribal Trust Lands Act (1969) and reassigns control over land to the President, with administration by the RDCs, rather than chiefs or headmen (which under the Land Tenure Act (1970) existed in terms of a tribal land authority). The Act represents another return to the central control of land and is an extension of the colonial drive towards state control via community control, subordinating

custom to state control. By-laws enacted by the RDC may override any customary claims. As Thomas (1991:15) pointed out, "the rather autocratic nature of these model by-laws tends to preclude their potential to enable rural people to plan their own land use strategies". The technocratic style is reminiscent of colonial land use planning, and runs counter to the rhetoric of participation and decentralised planning of the Prime Minister's Directive of 1984 which outlined the institutional framework for rural development (Bradley and McNamara, 1993).

The Natural Resources Act (1942) has been amended 25 times, although not substantially. It is a highly interventional piece of legislation, particularly as it applies to the communal areas and has resulted in the last 70 years in probably the most extensive level of state intervention in natural resource management anywhere in Africa (Bradley and McNamara, 1993). The Natural Resources Board administers the Act and is independent of government (section 3). It is unelected and unaccountable (except to the President). The Board may order the owner, occupier or user of any land to undertake measures or cease any activity the Board may deem necessary for the conservation of or prevention of injury to the natural resources of the land (section 46). The President, on the recommendation of the Natural Resources Board, may set aside whole parts of communal areas for resource preservation, conservation works or if the land is deemed to be despoiled (sections 61 and 63).

The Forest Act (1948), amended in 1982, allocates large areas of former communal land to the Forestry Commission, which leases timber, hunting and photographic tourism concessions. The Act defines regulations over forest and tree management that set the parameters of state intervention to protect forests or set aside land for production forestry. Section 33 gives sweeping powers to the President (through the Forestry Commission) to protect forested land. Land owners are offered some rights of compensation (section 33 (2), but this does not apply to trust land in the communal areas. Section 34 gives equally wide powers to set aside land for production forestry. With control over a vast forest estate, the Forestry Commission is empowered by the Act to govern the use of demarcated forests (including cultivation, grazing, residence, camping and picnicking) under section 56. Lease arrangements are permitted within demarcated forests where rents accrue to the Forestry Commission.

The Communal Land Forest Produce Act (1928) was amended in 1987 although the content is virtually identical to its colonial predecessor. The Act outlines specific regulations that

apply to communal areas. It restricts the use of forest products in communal areas to own use (section 4) and excludes use of products from protected forest areas (declared by the Minister under section 15), reserved trees (listed in schedule 1), areas where licences, agreements or permits to cut have been granted to others (sections 5,6,7) and where plantation rights exist (section14). Exceptions may exist when trees are cut in the course of clearing for agricultural land (section 4). The Act restricts the sale of forest products or use of forest products by people not resident in the area (section 4). It also allows for charging levies to those wishing to sell wood products. In other words, without a permit or licence, any use of woodland is virtually illegal in the communal areas.

The Rural District Council Act of 1988 reinforces the power of the council as the major force in local administration and governance. Under this Act, councils are empowered to carry out planning and development functions, raise levies and charge rents from residents, enter into contracts and tenders and engage in commercial activities for council revenue earning. The general powers relating to resource management include powers to plant trees, to take measures to conserve natural resources, to provide fencing for common land, to clear land and to permit grazing and cultivation (section 71). These powers may be enacted through by-laws adopted by council (section 88).

It is apparently clear from the foregoing that natural resource legislation in Zimbabwe concentrates considerable power in the hands of RDCs and other agencies of central government without regard for devolution of functions and decision-making to sub-district levels. This has severely hampered the progress of the CAMPFIRE concept which thrives on a complete devolution of rights over resources to villages and wards at the sub-district level.

Figure 4.2 presented earlier graphically highlights another source of criticism for CAMPFIRE, that of a lack of diversification in income generating activities. Despite a drive to diversify CAMPFIRE through investments in projects not linked to wildlife management in areas outside the traditional wildlife districts, trophy hunting and wildlife products continue to dominate CAMPFIRE revenues (Child et al, 2003; Chitsike, 2000). Over 95% of CAMPFIRE income continues to come from sport hunting or wildlife products (Child et al, 2003; Feresu, 2010). However, it is important to note that the drive towards diversification coincided with a period of serious economic challenges in the country. Lack of revenue diversification explains why only those districts endowed with wildlife such as Binga, Guruve, Chiredzi, Nyaminyami, Tsholotsho, Hurungwe, Hwange, Muzarabani, Beitbridge,

Chipinge, Gokwe North and Gokwe South, referred to as the 'big twelve' wildlife districts, have consistently received some relatively significant income from CAMPFIRE activities (Child et al, 2003).

4.5 The third decade after independence: 2000-present

The year 2000 was a watershed year which heralded a dramatic shift in the political register in Zimbabwe (Chimhowu and Hulme, 2006; Potts 2006; Wolmer et al, 2004). At the heart of this political shift was the issue of land which eventually culminated in the so-called fast-track land reform programme (Wolmer et al, 2004). As has already been shown, not much was done in the first decade of independence in terms of redressing the land ownership imbalances created during the colonial period. This was mainly due to the Lancaster House Agreement based on the willing-buyer-willing-seller principle which prevented a radical approach to land redistribution from being adopted. However, with the expiry of the Lancaster House Agreement, in 1990, followed by the enactment of the Land Acquisition Act in 1992, the pace of land redistribution did not change much. It soon became clear that the slow pace of land redistribution could not, after all, be blamed on the constraints and excuses of the Lancaster House Agreement (Waeterloos and Rutherford, 2004; Wels, 2003). It became apparent that land resettlement was just not a first priority on the national agenda of the new post-independence government (Chimhowu and Hulme, 2006; Waeterloos and Rutherford, 2004; Wels, 2003). In 1983, the budget of the Ministry of Lands was cut by 53%, which was the largest cut for any ministry that year, followed in 1986 by the abolishment of the Ministry of Lands as a separate ministry which was then put under the Ministry of Agriculture, culminating in the eventual reduction of the land acquisition budget by more than 50% in 1988 (Wels, 2003). All this was proof that land redistribution had never been a top priority for the new government. Some argue that since the white commercial farmers contributed considerably to export earnings and were major tax payers, the Zimbabwe government was reluctant to pursue a radical implementation of land resettlement fearing a collapse of the highly agricultural economy (Mashinya, 2007; Moyo, 2006; Wels, 2003). It was only during or around elections that the issue of land redistribution would resurface, and merely as political rhetoric (Chimhowu and Hulme, 2006; Wels, 2003).

Many researchers now view the adoption by government of the fast-track land redistribution programme at the beginning of the new millennium as a politically motivated rather than a consciously planned move (Chavunduka and Bromley, 2013; Makadho, 2006; Waeterloos

and Rutherford, 2004; Wels, 2003). At the beginning of 2000, the government was faced with difficult choices concerning the land issue (Makadho, 2006). First, the failure of the donors' conference to raise funds for land redistribution was one indicator of mounting political pressure on the government (Chavunduka and Bromley, 2013; Makadho, 2006; Wels, 2003). More and more people were showing signs of disgruntlement and impatience with how government had handled the land issue, with some expressing this through some isolated illegal land occupations which government increasingly could not condemn (Chimhowu and Hulme. 2006; Makadho, 2006; Wels, 2003). This was followed by the defeat of the 'yes' vote in a constitutional referendum in February 2000 which could have allowed government to more expeditiously and constitutionally acquire land for redistribution (Chavunduka and Bromley, 2013; Makadho, 2006; Moyo, 2006; Raftopoulos, 2009; Wolmer et al, 2004). The Zimbabwe African National Union Patriotic Front (ZANU PF) led government saw the rejection of the constitution as a serious threat to its political survival as this was a clear indication that its political support base was fast dwindling (Chavunduka and Bromley, 2013; Pottie, 2003; Raftopoulos, 2009; Wels, 2003; Wolmer et al, 2004). This was of grave concern for the ruling party as it was faced with decisive elections where the majority of the people were questioning the ability of government to deliver its promises on land resettlement (Makadho, 2006; Waeterloos and Rutherford, 2004). Parliamentary and Presidential elections were set for June 2000 and March 2002, respectively. The rejection of the referendum was the last straw which ignited the process of land reform code-named 'fast-track' (Makadho, 2006). This was followed by politically motivated violence mainly targeting the newly formed Movement for Democratic Change (MDC) which was fast growing and posing as a viable opposition to ZANU PF (Wels, 2003). The fast-track land reform programme is discussed in greater detail below.

4.5.1 The fast-track land reform programme

The fast-track approach to the land reform programme in Zimbabwe was officially launched on 15 July 2000 and was expected to last until December 2001, though the process was still going on by 2006 (Chavunduka and Bromley, 2013; Mashinya, 2007). The fast-track programme was a turning point in government land policy in terms of philosophy, practices and procedures of acquiring land and resettling people (Chimhowu and Hulme, 2006; Moyo, 2006; Waeterloos and Rutherford, 2004). The objectives of the fast-track phase were to immediately identify not less than 5 million hectares of land for compulsory acquisition

(revised to 11 million hectares in 2001), followed by a planning, demarcation and settlement process of landless peasant households on the acquired land (Makadho, 2006; Moyo, 2006). The government would then proceed to provide limited basic infrastructure and farmer support services (Makadho, 2006). While the fast-track programme was initially targeted at decongesting communal lands, it was extended in the latter stages to incorporate the creation of an indigenous commercial farming sector (Makadho, 2006), with such an afterthought indicative of poor planning. The legal framework governing land acquisition was significantly amended so as to take account of the rapidly changing policy environment of the fast-track programme (Makadho, 2006). The Eleventh Amendment to the Constitution in June 2000 absolved the Government of Zimbabwe from compensating for land, which became the responsibility of the colonial power, Britain (Government of Zimbabwe, 2000a). The government was only obliged to pay for improvements on the farm. The Land Acquisition Act of 1992 was also amended in line with the constitutional amendments of June 2000 to reflect the new government stance on rapid land redistribution (Government of Zimbabwe, 2000b). This was done, firstly, so as to free the government from any obligation to pay for unimproved land and to define the processing and valuation of compensation for improvements (Moyo, 2006). Second, the Land Acquisition Act of 2000 streamlined the previous Act's dual route of compulsory acquisition by eliminating the designation route and retaining the direct acquisition route with clearly defined procedures for compensation (Government of Zimbabwe, 2000b). The obligation to compensate the white commercial farmers for compulsorily acquired land was passed on to Britain, the former colonial power, with government only compensating for improvements on the land (Government of Zimbabwe, 2000b; Hellum and Derman, 2004). Third, the Land Acquisition Act Amendment removed the numerous administrative and legal encumbrances which previously led to more successful litigations against compulsory acquisition between 1993 and 1999 (Hellum and Derman, 2004; Moyo, 2006). What was now happening is that parliament was enacting legislation for the compulsory acquisition of land, which had been rejected in the constitutional referendum in February 2000 (Mashinya, 2007). About 90% of large-scale commercial farmland was confiscated and resettled without compensation (Mashinya, 2007). There were serious disagreements over the value of improvements on the land between government and landowners' valuators, resulting in most of the former landowners refusing to hand over the title deeds of their properties (Makadho, 2006).

The fast-track land reform programme was chaotic, violent and poorly implemented and thus had far reaching negative impacts on almost all aspects of life in Zimbabwe including the diplomatic, social, economic, and ecological spheres (Clover and Eriksen, 2009; Hellum and Derman, 2004; Mashinya, 2007; Potts, 2006; Waeterloos and Rutherford, 2004). This resulted in donors, international financial institutions and investors leaving the country resulting in severe economic damage to the country (Moyo, 2006). The International Monetary Fund delayed and eventually cancelled a balance of payments support disbursement primarily because of concerns over government's land policy and its effect on investment (Moyo, 2006). This saw the economy, since 2000, spiralling out of control with massive unemployment and inflation levels in the thousands (Clover and Eriksen, 2009).

There was a significant loss of employment in the tourism sector which was bringing about US$30 million annually to the country in the 1990s (Clover and Eriksen, 2009). This was due to a rapid decline in tourist arrivals in Zimbabwe as news of politically motivated violence spread across the globe. Perhaps the largest drop in employment since 2000 was registered in the agricultural sector, from 26% of total labour force in 2000 down to 15% in 2004 (Clover and Eriksen, 2009). This saw about 1.5 million farm workers not only becoming unemployed but also homeless as the majority of them were third generation Zimbabweans of Mozambican, Malawian and Zambian descent with no right to farm in the customary tenure lands (Clover and Eriksen, 2009).

There was also massive decline in agricultural productivity as large scale commercial farmers who had gained experience over several decades were suddenly ejected from the farms (Chavunduka and Bromley, 2013; Makadho, 2006; Moyo, 2006). The newly resettled farmers lacked expertise, in addition to lacking the resources with which to work the land (Makadho, 2006; Mashinya, 2007; Moyo, 2006). Government had no funds to subsidise the new indigenous farmers which resulted in most of the resettled farms lying idle, a situation persisting up to today (Chavunduka and Bromley, 2013). Tobacco production, a major foreign currency earner before 2000, dropped from 230 million kg in 2000 to about 50 million kg in 2006 (Mashinya, 2007). Total agricultural output declined by 44% by 2007, with commercial and small-scale production reduced by 55% and 22%, respectively (Clover and Eriksen, 2009). There was a deficit of 891 000 metric tonnes for the staple maize in 2007, a situation which worsened in 2008, prompting humanitarian agencies to scale up food aid to about 4.1 million people (Clover and Eriksen, 2009). The specialised beef and dairy

industries also registered significant decline due to the fast-track resettlement programme, with the new farms facing shortages of inputs (Clover and Eriksen, 2009).

An attempt to control hyperinflation through price controls on basic commodities and agricultural inputs worsened the situation by fuelling a parallel market (Mashinya, 2007). By 2006, US$1 was equivalent to Z$99 202 at the official rate, while it traded at Z$200 000 on the parallel market (Mashinya, 2007). This saw salaries and wages becoming virtually useless.

Thus, despite aiming at addressing overcrowding and resource scarcity in the marginal communal areas of the country, the fast-track land reform programme has paradoxically precipitated new ecological, economic, political and social challenges for Zimbabwe (Clover and Eriksen, 2009). This was largely due to the unplanned, chaotic and politically motivated nature of the programme, attributes which future land reform endeavours should avoid at all costs.

4.5.2 Impact of the fast-track land reform programme on biodiversity conservation and rural livelihoods

Zimbabwe has undergone significant and far-reaching political, economic, ecological and social upheavals since adopting the accelerated land reform exercise in 2000, which has seen the country descending into a state of protracted crisis (Rihoy et al, 2010). This has seen its relatively strong economy being reduced to the weakest in the region, with once reasonably stable political conditions now characterised by civil unrest and political repression, in addition to a previously well-functioning bureaucracy being reduced to tatters (Bauer and Taylor, 2005; Hill, 2005; Rihoy et al, 2010). In light of the above, the fast-track land reform programme has brought with it adverse impacts on biodiversity conservation activities in the country and this section shall concentrate on the impacts of the accelerated land reform exercise on private conservancies and game ranches, and CAMPFIRE areas.

As a recap, it is important to note that before the fast-track land reform programme in 2000, private wildlife conservation had become well established in Zimbabwe. However, as shown earlier, the state viewed the wildlife sector with suspicion and argued that wildlife production, which requires large blocks of contiguous land, was incompatible with land reform, and tended to perpetuate colonial land imbalances (Bond and Cumming, 2006). With the coming of the accelerated land reform in 2000, the private wildlife sector was certainly

not spared. Records indicate that 655 game farms and conservancies were acquired (wholly or partially) for resettlement during the fast-track land reform period (Feresu, 2010). Some of the acquired game ranches and conservancies continued with wildlife activities while others were partially or wholly converted into agricultural land (Bond and Cumming, 2006; Feresu, 2010). For example, Bubiana Conservancy, measuring 84 803 ha ceded more than 17 000 ha for the AI farming model, while Bubye River Conservancy ceded 5 600 ha also for AI resettlement (Feresu, 2010). The Save Valley Conservancy in Chiredzi, one of the largest private conservancies in the world, also lost some of its area to resettlement. This was in line with Statutory Instrument 288 of 2 000 which set out maximum permissible farm sizes per agro-ecological region, though this was not strictly adhered to in the implementation of the land resettlement programme (Makadho, 2006).

While there is generally a dearth of information on the current status of wildlife on the game farms and conservancies, unconfirmed reports indicate that species populations declined by about 30% on average, mainly as a result of inadequate supplementary provisions such as water and feeds and illegal off-take and inadequate security on those acquired farms and conservancies where the wildlife land use system was maintained (Feresu, 2010). The UNDP estimates that about 40% of wildlife was lost as a result of change from wildlife management to agriculture (Feresu, 2010). Another estimate indicates that wildlife declined by 80% in conservancies and game farms and by 60% in national parks (Clover and Eriksen, 2009). Hunting and cutting down of trees by the new farmers so as to open up virgin lands for agriculture, reduce competition for grazing from wildlife, and protect livestock from predation were some of the main reasons for the decline in wildlife (Clover and Eriksen, 2009). Clover and Eriksen (2009) further argue that the elimination of wildlife by the new settlers was also a way of protesting against the historical loss of land where every black African was stereotyped as a potential poacher and every white man a land robber, a concept they have termed ‘eco-retribution’.

Some of the few game farms and conservancies that have not changed hands after the fast-track land reform programme include Save Conservancy, Bubiana Conservancy, Malilangwe Ranch, Halglen Ranch, Bubi Ranch, Bally Vaughn Game Ranch, Antelope Park, Imire, Johnsyls, Mbizi, and Rosslyn Ranch. These have a combined area of 300 000 ha (Feresu, 2010), indicating a marked resilience of the private wildlife sector in Zimbabwe.

The fast-track land reform process has also had several important impacts on CAMPFIRE. Firstly, the effective destruction of institutions for the control of land and natural resources in the large-scale commercial farming sector has also been mirrored in the communal farming sector, severely undermining some of the evolving institutions for the control and management of wildlife and wildlife habitat (Bond and Cumming, 2006). In addition, the demand for land created by deindustrialisation and movement of people (labourers) off large-scale commercial farms has further exacerbated the situation (Bond and Cumming, 2006). Resultantly, wildlife habitat is now under greater pressure than at any time since the start of CAMPFIRE in the late 1980s (Bond and Cumming, 2006). Secondly, the fast-track land reform process resulted in a shift in attention towards the large-scale commercial farming sector (Bond and Cumming, 2006). This has reduced the attention that is needed to resolve the ongoing land and natural resource problems within the communal areas of Zimbabwe (Bond and Cumming, 2006).

Perhaps one of the greatest impacts on CAMPFIRE, of the fast-track land reform exercise and the ensuing political and economic turmoil, is related to the decline in tourist arrivals into the country owing to increased negative international publicity (Clover and Eriksen, 2009; Nemarundwe, 2005). This has seen trophy hunting declining markedly in many CAMPFIRE areas thereby depriving impoverished rural communities of a significant source of income (Clover and Eriksen, 2009; Nemarundwe, 2005). It is important to note that much of the income from CAMPFIRE has been instrumental in various community development projects such as schools and clinics, in addition to being paid out as household dividends which acted as a significant add-on to other livelihood activities such as crop and livestock production (Clover and Eriksen, 2009; Nemarundwe, 2005; Wolmer et al, 2004). Inflation rates reached 1700% by 2005 while record hyperinflation overtook the economy by 2008, rendering the Zimbabwean dollar virtually worthless (Rihoy et al, 2010). Under such circumstances, the losses to inflation of CAMPFIRE cash benefits were massive, thereby undermining community investment projects, in addition to rendering as worthless any household cash dividends (Rihoy et al, 2010). While the Reserve Bank of Zimbabwe has scrapped the Zimbabwean dollar and adopted a multi-currency system since the latter part of 2009 as a way of arresting spiralling inflation, tourist arrivals have remained low due to the country's continued negative international publicity.

The economic decline following the fast-track land reform programme also saw many RDCs, as the appropriate authorities for wildlife, holding on to most of the revenue generated through CAMPFIRE as they were now facing some serious financial dire straits (Child et al, 2003; Duffy, 2000; Rihoy et al, 2010). The absence of other income or taxable options has presented itself as a strong disincentive for fiscal or other devolution in CAMPFIRE by RDCs (Rihoy et al, 2010; Taylor and Murphree, 2007). The reduction in the flow of benefits down to sub-district levels in turn has reduced the incentive for wildlife conservation among many CAMPFIRE communities leading to an increase in illegal off-take in many areas.

The 1980s and 1990s witnessed the growth of a vibrant civic society in Zimbabwe, with NGOs receiving generous support from donors and effectively collaborating in many government programmes (Rihoy et al, 2010). The CAMPFIRE programme was no exception, with government agencies, NGOs, academic institutions, and donors working together in implementing the programme (Child et al, 2003; Rihoy et al, 2010; Rihoy and Maguranyanga, 2007). The volatile political climate that built up after 2000 presented a difficult operational environment for civil society particularly in rural development as many civic organisations were accused of siding with the opposition by government, culminating in the 2005 NGO Bill which considerably curtailed NGO functions and independence (Bauer and Taylor, 2005; Nemarundwe, 2005; Raftopoulos and Savage, 2005; Rihoy et al, 2010). The marginalisation of civic society had significant impacts on CAMPFIRE as such organisations were prevented from playing any significant role in the programme (Child et al, 2003, Rihoy and Maguranyanga, 2007; Rihoy et al, 2010). In addition, most of the donors that had bankrolled the various NGOs involved in CAMPFIRE withdrew from the country resulting in loss of access to crucial funding for the programme, a situation that has persisted up to the present moment (Rihoy et al, 2010).

The deindustrialisation and ensuing massive unemployment that was triggered by the fast-track land reform programme also negatively impacted upon the remittances that had supplemented the incomes of many rural households (Clover and Eriksen, 2009). This led to increased diversification into off-farm activities exploiting the natural environment such as wildlife poaching, stream bank gold panning, and deforestation for fuel wood selling, among other environmentally detrimental and unsustainable activities (Clover and Eriksen, 2009). Such activities have in turn threatened the same wildlife resource base upon which CAMPFIRE relies.

While the area under wildlife was declining in Zimbabwe after the fast-track land reform programme particularly for private conservancies and game ranches, the opposite was taking place in other countries in the region (Bond and Cumming, 2006). For example, land under wildlife expanded by 40% in Namibia and by 10% in Mozambique and Zambia between 1996 and 2000 (Bond and Cumming, 2006).

4.6 Whither rural development in Zimbabwe?

The agrarian structure based on the allocation of land to exclusive white commercial and black communal sectors in colonial Zimbabwe produced one of the most polarised and dualistic agrarian structures based on race in sub-Saharan Africa (Mehretu and Mutambirwa, 2006). Such a structure presented a major challenge to rural development in Zimbabwe (Mehretu and Mutambirwa, 1999). In the communal lands, Africans were not only impoverished by virtue of the poor land resources they had but were also restricted by a variety of social, legal and physical barriers from access to development resources in the commercial white sector (Mehretu and Mutambirwa, 2006). In the face of increasing population pressure, communal lands began to experience high densities which in turn led to the degradation of already limited land resources and reduced carrying capacities for livestock and people (Whitlow, 1988a; Whitlow, 1988b). As time passed, and as better arable land in the communal lands became appropriated for commercialisation, the communal lands not only faced high population densities but were also exposed to severe exploitation of their labour force by the commercial sector (Mehretu and Mutambirwa, 2006). In addition to having adverse effects on agricultural productivity in the communal lands, these developments exacerbated and sharpened the prevailing profiles of poverty among Africans in the communal areas (Mehretu and Mutambirwa, 2006).

With the coming of independence in 1980, the new government had a huge challenge of addressing the acute imbalance in social and physical infrastructure between the communal and commercial farming areas (Bond, 1999). The post-independence government adopted the ‘growth with equity’ policy whose focus was the development of the communal lands (Bond, 1999). One of the targets of the policy was infrastructural development in the communal areas which included roads, bridges, schools, and clinics. It is worth noting that the liberation war which brought independence had also destroyed most of the limited infrastructure in the communal areas (Bond, 1999). However, despite impressive figures in terms of

infrastructural development and the extension of services to communal lands, this did not result in poverty reduction in the communal areas (Bond, 1999).

Another crucial component of the growth with equity policy was the resettlement programme which aimed at easing population pressure in the communal lands. However, as has been shown earlier, the resettlement programme fell far short of the expected targets (Clover and Eriksen, 2009; Makadho, 2006; Moyo, 2006). A latter version of the resettlement programme, the so-called fast-track land reform programme, was politically motivated and poorly planned and executed (Clover and Eriksen, 2009; Wels, 2003; Wolmer et al, 2004), and even adversely affected the rural livelihoods it was initially meant to improve (Clover and Eriksen, 2009). Closely related to the initial phases of the resettlement programme was the agricultural pricing policy. This policy initially resulted in a significant expansion of marketed output from communal lands but was eventually unsustainable due to the high costs involved in maintaining the parastatal marketing organisations, in addition to the agro-ecological constraints to production in the majority of the communal areas (Bond, 1999; Scoones and Wolmer, 2003).

The growth centre strategy was also adopted so as to bring development to the communal rural sector (Auret, 1990; Rambanapasi, 1990; UNDP, 2004). Such growth points were principally to service the rural areas left out due to colonially racist policies (Wekwete, 1988). Each established centre would service a productive hinterland that would then foster economic development in the centre. It was assumed that these new centres would generate residual growth through the trickle-down effect thereby eventually modernising and urbanising the rural sector (Thirlwall, 1994).

Substantial public expenditure was made in the growth centres during the 1980s (Auret, 1990; Government of Zimbabwe, 2002; Murithi, 2009). However, the impact of the growth centres on economic development in the communal areas has been disappointing (Conyers, 2001; Murashiki, 2010; Rambanapasi, 1990). Although lack of an economic base has been the main reason for the low level of investment in most growth points, other factors were also involved, including lack of financial incentives such as tax concessions especially in the initial stages of the implementation of the growth point strategy (Auret, 1990; Hurungo, 2007; Rambanapasi, 1990). The cuts in government expenditure which occurred in the 1990s due to ESAP came into effect before the programme of infrastructure and service provision was completed thereby further hampering the growth of these centres (Auret, 1990; Conyers,

2001). Consequently, the growth-centre strategy failed to bring development to the communal areas.

The persistent failure of the above strategies, programmes and policies aimed at rural development has fostered a perpetuation of poverty in the communal areas of Zimbabwe even at three decades after independence. As such, rural development policy in the country appears to be at a crossroad, with policy makers seeking for alternative rural development paths (Scoones and Wolmer, 2003). It is within this context that biodiversity conservation areas in Zimbabwe are increasingly playing (or expected to play) a significant role as an alternative to the conventional approaches to rural development (Bond, 1999). Indeed, CAMPFIRE's role in rural development in Zimbabwe is well documented while private protected areas have also forged some development partnerships with surrounding communities through various outreach activities.

4.7 Conclusion

The chapter has reviewed biodiversity conservation and natural resource management policy in relation to rural livelihoods in Zimbabwe. It has been shown that access to, and use of, natural resources in the country has gone through various periods. The pre-colonial period represents a time period when access to resources by indigenous populations was unlimited, with people and their natural environment coexisting in harmony (Chenje et al, 1998). The colonial period was characterised by the appropriation of land by white settlers from the indigenous black people, culminating in one of the most racialised land and natural resource ownership and utilisation patterns in the world (Chenje et al, 1998; Kwashirai, 2007; Mapedza, 2007; Muboko and Murindagomo, 2014). This represented a major loss of livelihoods as natural resources had played a crucial role in the daily sustenance of the people. The communal areas or reserves to which the indigenous people were evicted were soon characterised by overcrowding and poverty which eventually led to serious land degradation.

At independence in 1980, the new majority government sought to redress the land and natural resource ownership imbalances created during colonialism. However, efforts in that direction were significantly curtailed by the Lancaster House Constitution which slowed down the pace of land reform through the willing-buyer-willing-seller clause (Chimhowu and Hulme, 2006; Clover and Eriksen, 2009; Wels, 2003). However, even after the expiry of the Lancaster

House Agreement in 1990, the pace of land reform remained slow such that by 2000, the colonial land and natural resource ownership status quo was largely maintained proving that, after all, land reform was not top on the agenda of the new government (Wels, 2003).

The late 1980s witnessed some devolution in natural resource management to local communities from central government through the CAMPFIRE programme. CAMPFIRE has been hailed as an important step towards empowering local communities through the sustainable use of natural resources which is key for improving the livelihoods of poor rural communities (Frost and Bond, 2008; Muboko and Murindagomo, 2014; Murombedzi, 2010). However the devolution of natural resource management to local communities has been criticised as a half-measure as such devolution has not reached the lowest possible levels truly representing local community institutions (Muboko and Murindagomo, 2014; Nelson, 2010).

The year 2000 saw government implementing the accelerated land reform programme code-named 'fast-track', mainly as a political survival move and also as a reaction to mounting disgruntlement over the slow pace of land reform since independence (Chavunduka and Bromley, 2013; Makadho, 2006; Wels, 2003). The fast-track land reform programme was however poorly planned which eventually plunged the whole country into a prolonged economic, social and political crisis that has isolated the country from the international community. Ecologically, the fast-track land reform programme also adversely affected conservation activities in the private wildlife conservation sector as some of the game farms were also earmarked for resettlement (Clove and Eriksen, 2009). CAMPFIRE activities have also been severely affected by the adverse political, economic and social climate born out of the politically motivated and ill-planned accelerated land reform exercise (Bond and Cumming, 2006; Clove and Eriksen, 2009; Feresu, 2010). This has mainly been through the pulling out from the country by donors and NGOs that had been critical in the initial success of CAMPFIRE as the crisis in the country deepened.

In response to the clarion call in international biodiversity conservation literature calling on protected areas to be actively involved in the improvement of the livelihoods of surrounding communities, conservation areas in Zimbabwe have increasingly been involved, in various ways, towards contributing to the sustainability of local livelihoods. The need for such a social responsibility by the country's protected areas has further been necessitated by the failure of various conventional rural development initiatives in the country since

independence (Bond, 1999; Scoones and Wolmer, 2003). The current economic and political crisis in Zimbabwe has, however, also negatively affected the performance and integrity of some of the various protected areas in the country, which in turn has also adversely impacted upon their social responsibilities to surrounding communities.

CHAPTER FIVE: RESEARCH METHODOLOGY

5.1 Introduction

This chapter outlines the processes and procedures that were followed in conducting the study. It begins by presenting the research questions framing the study. The chapter then gives a description of the study sites and the reasons why these were selected for this particular study. It then presents the study design, the instruments that were used for data collection, sampling procedures employed, and the data analysis procedure.

5.2 Research questions

The key questions framing this study derived from the research objectives presented earlier in Chapter One are:

- What are the current livelihood strategies and levels of socio-economic development of the communities in or adjacent to the study sites and how do these link to the natural resource base?
- How have the two conservation areas positively impacted upon the livelihoods of the local communities?
- What factors hinder the flow of conservation benefits to local communities?
- How have the two conservation areas negatively impacted upon the livelihoods of the local communities?
- What are the perceptions of various stakeholders on the state of biodiversity in the two conservation areas and what are the factors threatening biodiversity?
- How best can the conservation and livelihoods objectives in the two conservation areas be balanced?

5.3 Study sites

Two case study sites, Mahenye and Malilangwe, representing a community-based conservation area and a privately owned conservation area respectively, were chosen for the purpose of comparing them regarding their impacts on local livelihoods. These are presented below.

5.3.1 Mahenye ward

Mahenye ward is situated in south-eastern Zimbabwe (Figure 5.1). It lies in the extreme southern end of Chipinge District in Manicaland Province in Ndowuyu communal land. The ward consists of a narrow wedge of land of about 210 km^2 in extent lying between the Save River in the west and the Rupembi River in the east, which also forms the border with Mozambique (Anstey, 2009; Murphree, 2001; The Africa Resources Trust, 2002). To the south across the Save River is the northern boundary of Gonarezhou National Park, the second largest protected area in Zimbabwe, and also the Sangwe Communal Land in Chiredzi District (Murphree, 2001; The Africa Resources Trust, 2002). The northern boundary of Mahenye is Mutandahwe ward, also in Ndowuyu Communal Land.

The average annual rainfall for Mahenye is between 450-500mm (Murphree, 2001). Such a low rainfall makes the ward unsuitable for farming with local communities growing crops and keeping livestock on a purely subsistence basis (Mashinya, 2007). Most of the ward is covered by mixed mopane and combretum woodland with some dense riverine forest occurring along the Save River (Murphree, 2001). The alluvial soils along the Save River are used for the cultivation of vegetable and dry season grains by local communities (Murphree, 2001).

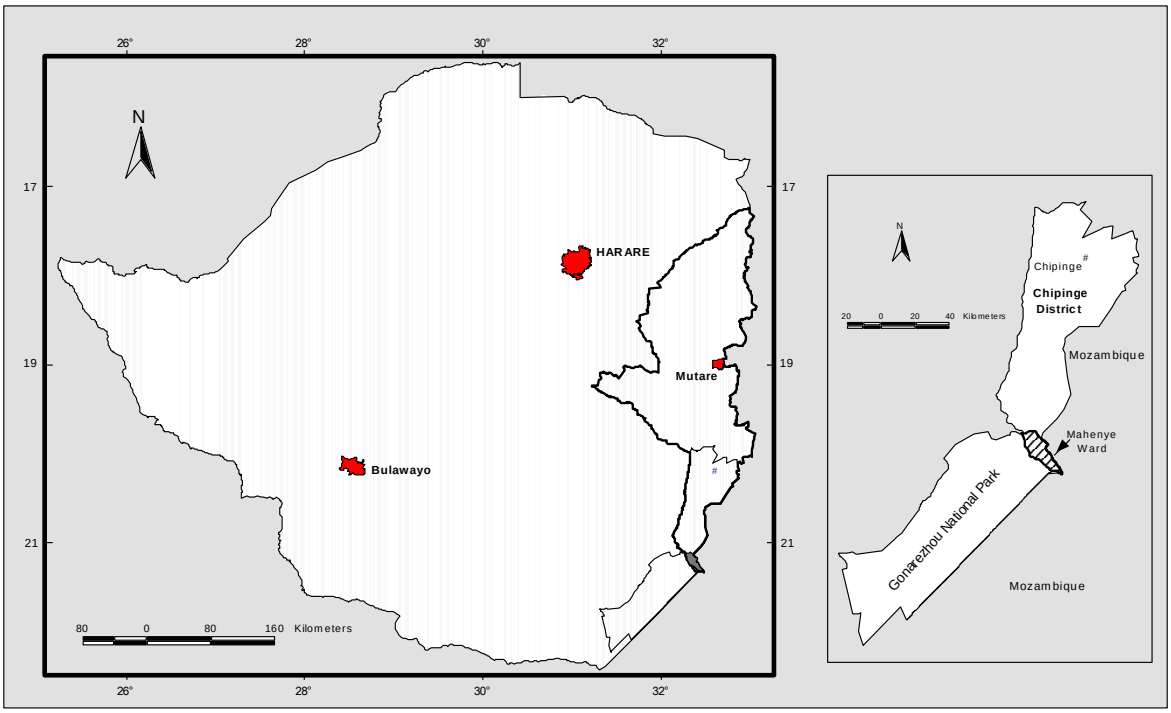

Figure 5.1: Location of Mahenye ward

One of the defining characteristics of Mahenye ward is its isolation (Murphree, 2001). The eastern boundary of Mahenye is a different country, Mozambique. The western neighbours of the ward are administratively in a different district, Chiredzi District, in yet a different province, Masvingo Province (Murphree, 2001). In addition, the Mahenye community is also ethnically distinct within Chipinge District (Murphree, 2001). While all the other wards in the district are made up of Shona-speaking Ndau peoples, Mahenye ward comprises Shangaan-speaking peoples (Murphree, 2001). The Shangaan people migrated from South Africa during the Nguni uprising before the 18th century (Hlambela and Kozanayi, 2005). Mahenye ward is also far from the main regional urban centres (Mashinya, 2007). The geographic isolation of Mahenye has greatly contributed to its socio-economic backwardness (Mashinya, 2007; Murphree, 2001).

In contrast to the rest of the wards in Ndowuyu Communal Land, which are highly populated and overgrazed, Mahenye ward is still relatively underpopulated and ecologically intact (Murphree, 2001). With a current total population of about 5000 people from about 1000 households, Mahenye ward has a population density of about 20 persons per km^2 (Mashinya, 2007). The average population density for Chipinge District, within which Mahenye is situated, is about 43 persons per km^2 (Central Statistical Office, 2012).

In the pre-colonial era, the Mahenye community originally settled in part of the area that is now under Gonarezhou National Park (Balint and Mashinya, 2006; The Africa Resources Trust, 2002). This area was rich in biodiversity including wildlife and the people heavily relied on wildlife and other natural resources to meet their daily basic needs (The Africa Resources Trust, 2002). The Mahenye people were finally evicted by the colonial Rhodesian government in the 1960s to make way for the expansion of Gonarezhou National Park and were resettled where they are now. Colonialism ushered in state ownership of all wildlife both within and outside of protected areas with hunting now forbidden. The people were forced to resort to subsistence pastoralism and cropping which, however, were unsuitable for the hot and dry area (Balint and Mashinya, 2006; The African Resources Trust, 2002). The inevitable result was an increase in poaching activities by local communities in both Gonarezhou National Park and adjacent areas.

While Mahenye is one of the first communities to be involved in CAMPFIRE, historically it is not a product of CAMPFIRE as communal natural resources management initiatives in Mahenye predate the CAMPFIRE Programme (Murphree, 2001). An attempt to reduce conflicts between the Mahenye community and Gonarezhou National Park in 1982 resulted in an innovative arrangement which acted as a precursor to CAMPFIRE (Balint and Mashinya, 2006). Under this arrangement, the Mahenye community was allowed to earn some income from government-approved trophy hunting while the community, in return, agreed to reduce poaching activities (Balint and Mashinya, 2006). Conflicts between the Mahenye community and Chipinge Rural District Council however hampered the successful implementation of the programme (Balint and Mashinya, 2006). The Mahenye CAMPFIRE project officially started in 1990 when Chipinge Rural District was granted appropriate authority to manage wildlife in the district.

5.3.2 MPWR and the adjacent Chizvirizvi resettlement area

MPWR is situated in the south-eastern Lowveld of Zimbabwe in Chiredzi District of Masvingo Province (20°58′–21°15′ S, 31°47′–32°01′ E) (Figure 5.2) (Capon et al, 2013; Clegg and O'Connor, 2012; Barson et al, 2008). MPWR is bordered by Gonarezhou National Park to the south and Hippo Valley Game Reserve in the west (Capon et al, 2013). MPWR also shares borders with three communal lands namely Matibi II Communal Land in the south western corner, a resettlement land to the north, and then Chizvirizvi resettlement area

to the east. The Chiredzi River forms the western boundary of MPWR while the Runde River divides the reserve from Matibi II communal Land.

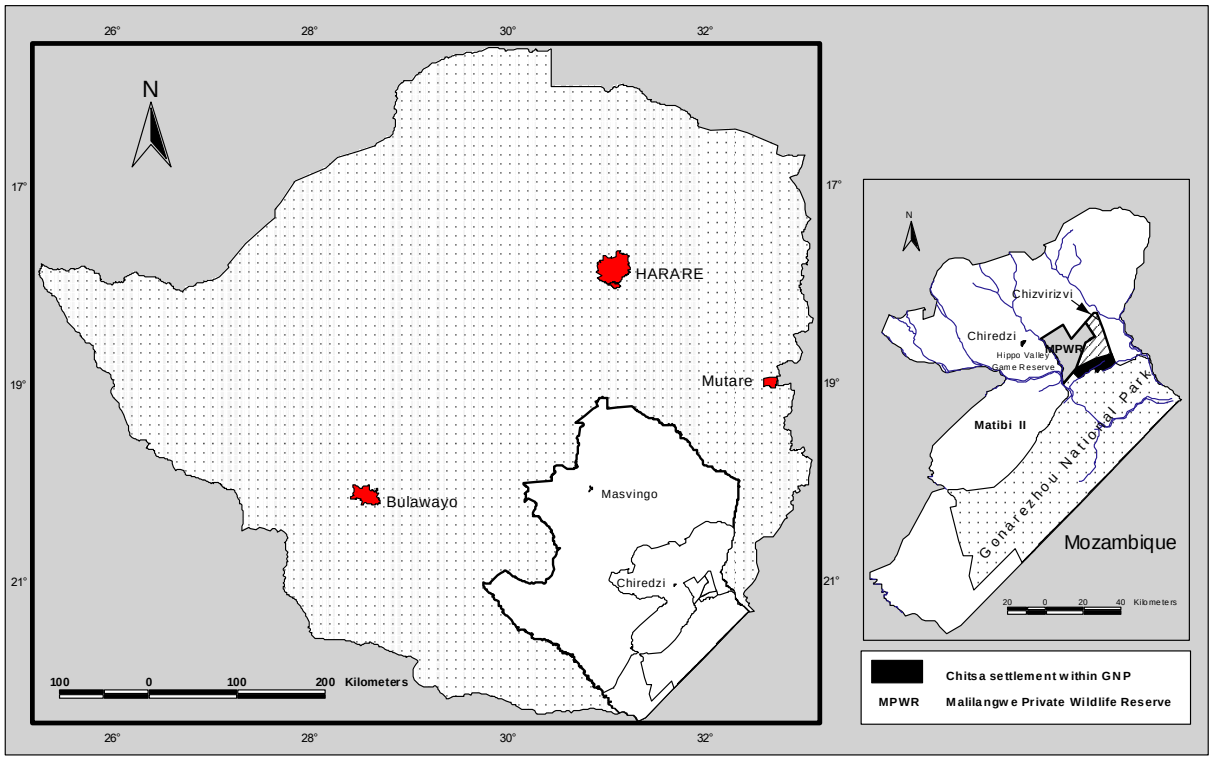

Figure 5.2: Location of MPWR and Chizvirizvi resettlement area

The MPWR's climate is characterised by three distinct seasons comprising a hot wet season from November to March, a cool dry season from March to August, and a hot dry season from September to October (Capon et al, 2013. The average minimum monthly temperature ranges from 13.4°C (July) to 23.7°C (December), while average maximum monthly temperature ranges from 23.2°C (June) to 33.9°C (November) (Clegg, 2010a). MPWR receives a seasonal low average annual rainfall of about 560mm with approximately 84% occurring during summer (November to March) while the remainder occurs during winter as light drizzle (Clegg and O'Connor, 2012).

The topography of MPWR is dominated by the Malilangwe Range, composed of rugged forest sandstone hills dividing the reserve along an east-west axis into northern and southern sections (Clegg and O'Connor, 2012). The area north of the Malilangwe Range is undulating and underlain by gneisses intruded by numerous doleritic dykes. Immediately to the south of Malilangwe Range is a gently sloping region with deep, well-drained, sandy soil outwashed from the Malilangwe Range (Clegg and O'Connor, 2012). Further south of the Range is a

plain underlain by karoo basalt (Clegg and O'Connor, 2012). The Malilangwe land surface slopes gently downwards in a south-westerly direction towards the Chiredzi and Runde rivers with altitude ranging from 510m at Hunyungwe in the Malilangwe Range to 300m at the Chiredzi-Runde confluence (Clegg and O'Connor, 2012). The western, northern and central regions of the reserve form the drainage basin for Chipimbi, Gananda and Nyamasikana rivers which all flow into Chiredzi River. The Nyamsaan, Mulovele, Mahande and Chiloveka rivers drain the eastern and southern parts of Malilangwe and these flow into the Runde River in the south (Clegg and O'Connor, 2012).

The MPWR is made up of a complex mosaic of geologic formations which include sandstones, gneisses, basalts, dolerites, grits, shales and sandstones (Clegg and O'Connor, 2012). The wide array of parent materials in MPWR has also resulted in various types of soils in the reserve. The sandstones have produced fine grained sandy soils, the gneisses have given rise to moderately shallow sandy soils, dolerite has weathered to form very shallow heavier textured soils, while soils on the basalt formations vary from deep vertisol clays to shallow sandy loams (Clegg and O'Connor, 2012). The grits are associated with moderately shallow, coarse grained sandy soils while the shales and mudstones have resulted in very shallow lithosols (Clegg and O'Connor, 2012). In addition, alluvial soils occur along the rivers of the reserve.

The vegetation of MPWR is dominated by a variety of open *colophospermum* mopane woodland with *Brachystegia* woodland characterising the Malilangwe Range (Capon et al, 2013). The varied adaphic characteristics of MPWR have also given rise to a wide variety of vegetation types, with Clegg (2010a) classifying the ranch into 38 vegetation types. The area also supports a large and varied wildlife population.

MPWR was formed in 1994 when the Malilangwe Trust purchased Lone Star Ranch and a neighbouring property forming one of the largest game reserves in the country. MPWR's current form of land use is ecotourism. Some cattle losses due to persistent droughts in the 1980s turned the southeast lowveld of Zimbabwe away from cattle ranching towards game ranching. MPWR occupies 39 378 ha (400 km^2) of land (Barson et al, 2008; Clegg et al, 2007; Clegg and O'Connor, 2012). The MPWR is secured by an electric fence, though this does not completely stop occasional break throughs especially by bull elephants (Clegg, 2010a).

Immediately to the east of MPWR is the Chizvirizvi resettlement area (Figure 5.2). The Chizvirizvi community was selected by this researcher so as to assess the conservation-livelihoods initiatives of MPWR with surrounding communities. The Malilangwe Trust, which owns MPWR, is a non-profit organisation pursuing conservation and social welfare objectives through investments in surrounding communities (Clegg et al, 2007).

Colonial land alienation and apportionment policies crafted in the early 1930s left a deep imprint on present-day patterns of land tenure and settlement in the Chizvirizvi area (Hlambela and Kozanayi, 2005). Chizvirizvi adjoins a private wildlife conservancy to the west, MPWR, and a national park to the south, Gonarezhou National Park (Figure 5.3). These nature parks were created through the eviction of communities and their relocation to the adjacent Sangwe communal lands (Chirozva, 2009). Over time, natural population growth inevitably resulted in population pressure in the communal areas (Chirozva, 2009).

With independence in 1980, a government-driven resettlement scheme based on a system of consolidated villages was developed and implemented in Chizvirizvi aimed at decongesting the communal lands (Hlambela and Kozanayi, 2005). The resettlement scheme was established on land purchased by government from adjacent commercial farms. Under the scheme land was divided into clustered villages, grazing areas and cropland with each household allocated five hectares of arable land while grazing was communal. The aim of such centralised settlement was enhanced peasant access to services including electricity, roads, schools, clinics and grinding mills (Hlambela and Kozanayi, 2005). A total of 10 villages comprising 283 households were established in the Chizvirizvi resettlement scheme. The scheme was under the control of a government paid resettlement officer. Almost all of the households under the scheme were of the Shangaan tribe which had earlier been displaced from the same area (Hlambela and Kozanayi, 2005).

The passage of time saw the people of Chizvirizvi becoming disillusioned mainly due to the scheme's failure to decongest the settlement. The five hectare arable land was not sufficient for most households to grow enough food as the low annual rainfall received in the area could not support rain-fed agriculture. Although the soils around Chizvirizvi are highly fertile, low erratic rainfall heavily deterred pastoralism and arable farming (Hlambela and Kozanayi, 2005). Community concern about congestion and environmental degradation in the Chizvirizvi resettlement scheme were heightened in 1987. These concerns marked the beginning of a community-led and demand-driven vision of land use planning and natural

resource management based on self-contained plots as opposed to the overcrowded cluster villages (Chirozva, 2009; Hlambela and Kozanayi, 2005).

The Chizvirizvi Development Committee then solicited for the support of the Department of Natural Resources for a more dispersed resettlement scheme comprising individual plots with plot holders having exclusionary rights over their plots. This would eliminate the 'tragedy of the commons' responsible for the land degradation that was occurring in the communally owned woodlands (Hlambela and Kozanayi, 2005). Further support was solicited from the Ministry of Lands and Agriculture in 1989. Although the ministry could not provide financial support for the programme, it gave endorsement for the Chizvirizvi Development Committee to access alternative funding arrangements including donor support (Hlambela and Kozanayi, 2005).

A funding meeting was finally organised (on request by the Chizvirizvi Development Committee) by the Malilangwe Trust, bringing together 49 community representatives and 15 visitors mostly from the University of Zimbabwe and foreign visitors from Zambia (1), Malawi (2), South Africa (2), Botswana (2) and the USA (1) (Hlambela and Kozanayi, 2005). The Malilangwe Trust donated Z$100 000 (US$2 632) for surveys, mapping and demarcation of plots. The Malilangwe Trust also repaired a broken down vehicle donated from the Masvingo provincial office which provided transport for the survey team, including an additional cash donation of Z$4 000 for fuel (Hlambela and Kozanayi, 2005).

A total of 294 self-contained plots, each measuring 85 hectares (or more for some in villages 6 and 10 more ecologically unsuitable) were finally demarcated out of the initial consolidated village scheme (Figure 5.3).

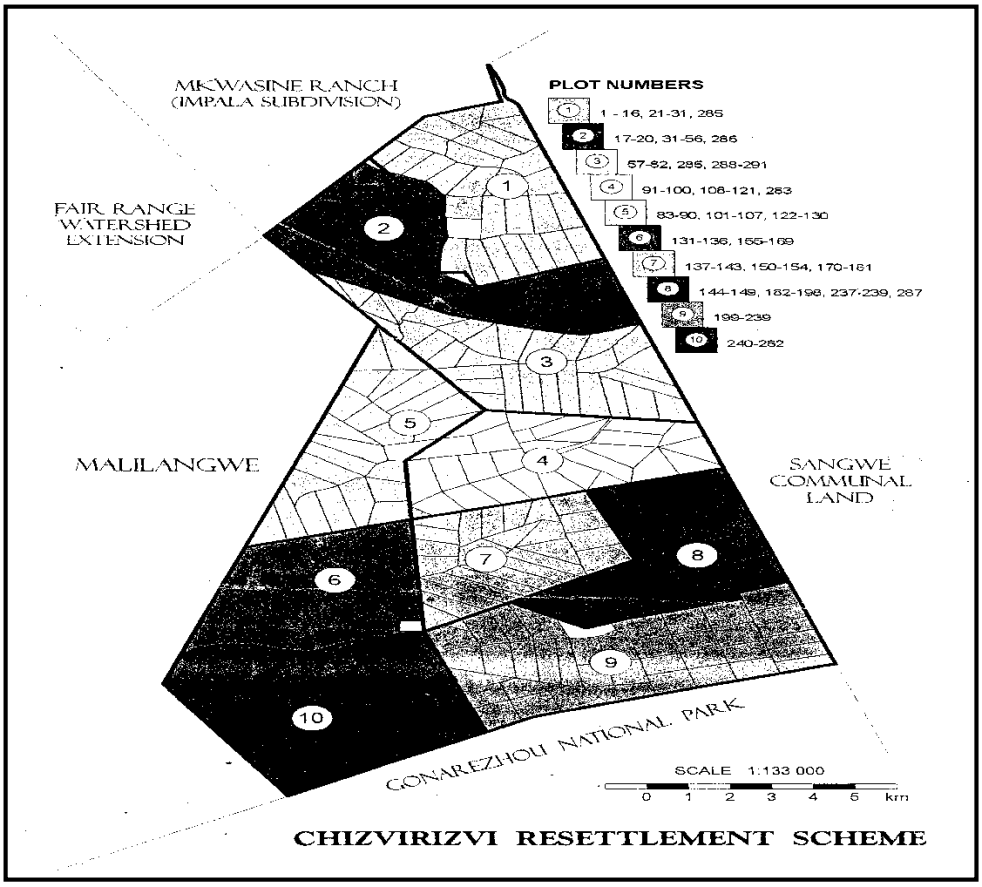

Figure 5.3: Some of the demarcated plots in Chizvirizvi
Source: Chiredzi Rural District Council

The relatively large plot sizes were necessitated by a need to compensate for low yields per area due to aridity. People began occupying these plots from March 2000. First preference to take up the new plots was given to people formerly residing in the government-consolidated villages. The area is still divided into 10 villages for administrative purposes, with each village presided over by a village chairperson. The plot holders however, do not have title deeds to the land to enable them to exercise exclusionary rights on resources in their plots. Like in the communal areas, they only enjoy rights to land based on usufruct, with the land legally being state land. The Chiredzi Rural District Council has been dragging its feet concerning the granting of title deeds (Chirozva, 2009; Hlambela and Kozanayi, 2005).

5.3.3 Rationale for the choice of study sites

The choice of the study sites was a result of several considerations. To begin with, Mahenye ward's experience with community-based natural resource management is one of the longest in the country. Such an experience, as shown earlier, antedates the national CAMPFIRE programme and can be traced back to 1982. This automatically makes Mahenye ward one of

the best examples of community-based natural resource management in Zimbabwe and, arguably, the whole of southern Africa.

The long experience with CBNRM initiatives in Mahenye ward, coupled with several researches conducted in the area over the years, has also yielded a sizeable body of literature which was quite useful for this research. This has made Mahenye to be more attractive to the researcher compared to other CAMPFIRE projects in the country with scant or even non-existent secondary information.

With regard to MPWR, it is one of the largest private game reserves in Zimbabwe. In addition, MPWR is also one of the best-managed private game ranges in the country. Additionally, MPWR is still intact and was not disturbed by the politically motivated fast-track land reform programme which began in 2000. Other private game reserves and conservancies such as Save Valley Conservancy, Bubiana Conservancy and Bubye River Conservancy have lost some of their land to the resettlement programme while others have even ceased to exist as they have been wholly acquired for resettlement.

MPWR's objectives are biodiversity conservation and community development. Such objectives are exactly the focus of the current study. This naturally attracted the researcher to MPWR as it guaranteed that meaningful results would come out of a study of conservation-livelihoods initiatives in MPWR. Some of the comparable potential study sites either did not incorporate the livelihoods objective or vaguely did so.

The above attributes of Mahenye and MPWR made them suitable case study sites for community-based and private conservation initiatives in the country respectively. While case studies for comparative purposes do not necessarily need to be in the same geographic vicinity (Biggam, 2011), the proximity of the two study sites to each other proved quite advantageous logistically. In addition to their proximity, the Mahenye CAMPFIRE area and MPWR came into existence around the same time period, 1991 and 1994 respectively. Their experiences with conservation-development initiatives have thus occurred within a more or less similar time frame thereby further enhancing their comparability.

The Chizvirizvi community was selected alongside MPWR because of its more enhanced accessibility to the game reserve compared to other surrounding areas. The accessibility of Chizvirizvi to MPWR has attracted more conservation-development initiatives from the conservation area compared to other surrounding communities. In addition, the Chizvirizvi

community has no CAMPFIRE project which could have confounded the identification and assessment of conservation-livelihoods initiatives by the private game reserve. The settlement of the Chitsa people along the whole Chizvirizvi-Gonarezhou National Park boundary (Figure 5.2) has also effectively cut off the Chizvirizvi community from the national park. This is also part of the reason why Chizvirizvi has no CAMPFIRE project as only communities sharing a boundary with public protected areas are given priority in joining the national CAMPFIRE programme. This isolation of Chizvirizvi from Gonarezhou National Park has in turn increased its interaction with MPWR.

5.4 Research design

The research design that this empirical study adopted to achieve its objectives and answer the research questions is the case study design. According to Biggam (2011), a case is one example of a particular type of something. Rule and John (2011) define a case as a particular instance which is singular and distinct. They elaborate further by stating that a case is a specific example of something that belongs to a larger category of instances. Gillham (2000: 1) defines a case as:

- a unit of human activity embedded in the real world;
- which can only be studied or understood in context;
- which exists in the here and now (is contemporary); and
- that merges in with its context so that precise boundaries are difficult to draw.

A case may be a process, activity, event, programme, organisation, institution, individual, group or community (de Vos et al, 2011; Gillham, 2000; Rule and John, 2011; Yin, 1994). It may even refer to a period of time (de Vos et al, 2011).

The word ‘study’ on the other hand, means an investigation into or of something (Rule and John, 2011). Studying a phenomenon involves examining it in detail often from a variety of perspectives, in order to understand it thoroughly. A study involves some kind of systematic method that requires a depth of examination (Rule and John, 2011). A case study is therefore a systematic and in-depth investigation of a particular instance in its context in order to generate knowledge (Rule and John, 2011). According to Bryman (2008), a case study entails the detailed and intensive analysis of a single case. Yin (2003) describes a case study as an empirical inquiry that investigates a contemporary phenomenon within its real life context,

especially when the boundaries between phenomenon and context are not clearly evident. In other words, a case study approach attempts to examine a modern phenomenon and the associated context that is not clearly evident. As a research strategy, the case study methodology aims at investigating a specific phenomenon so as to understand it completely by observing all of the variables and their interacting relationships (Dooley, 2002). It is a comprehensive account of a specific situation or occurrence describing who, what, where, when and how and this allows for the exploration of complexity and uniqueness, a task that is often beyond the reach of many research approaches (Dooley, 2002; Yin, 1994).

Several aspects of the case study method make it attractive. One strength of the case study approach is that it allows for the examination of a particular instance in a greater deal of depth, rather than looking at multiple instances superficially (Rule and John, 2011). It focuses on the complex relations within the case and the wider context around the case as it affects the case, and is therefore intensive rather than extensive (Rule and John, 2011). The singularity of focus of a case study also makes it more manageable than a large-scale survey or wide ranging policy review, especially in a research situation facing constraints of time and resources (Rule and John, 2011; Thomas, 2011). Another strength of the case study method lies in its flexibility. A case study can use a very wide variety of methods, both for data collection and for data analysis, depending on what is appropriate to the case (Bryman, 2008; Rule and John, 2011; Thomas, 2011). These may include interviews, documents, observations, archival records and questionnaires (de Vos et al, 2011). Such a mixture of data collection techniques enables the case study approach to obtain a rich output of data which helps in achieving data convergence (Biggam, 2011; Yin, 1994). The flexibility of the case study method is also in terms of what it studies. The unit of a case study can range from for example, an individual person to a country or continent (Rule and John, 2011).

Three types of case studies can be identified namely, descriptive/ intrinsic case study, explanatory/ instrumental case study, and collective/ comparative case study (de Vos et al, 2011; Yin, 1994). A descriptive case study is applied where extreme or unique cases occur and an intensive study is undertaken in order to produce detailed descriptions of these cases. The purpose of an explanatory case study is both theory building and testing. Finally, a collective or comparative case study is an instrumental case study extended to a number of cases where cases are chosen so that comparisons can be made between them in addition to theory building and testing (de Vos et al, 2011; Yin, 1994). Where a researcher choses to do

multiple case studies (more than one), the same research approach must be applied to each of the cases so as to allow for comparison between them (Biggam, 2011).

The present study, which examines a contemporary phenomenon encompassing biodiversity conservation and livelihoods, took the form of a comparative case study approach. It compares two conservation sites (cases), one a community-based conservation area, and the other, a private conservation area, in terms of their impacts on the livelihoods of local communities interacting with them. An in-depth study of these two cases was conducted through the use of mixed methods which were uniformly applied to both cases to enable comparison.

While the case study design adopted by this research proved quite appropriate and useful in achieving the study objectives and answering the research questions, its shortcomings, as with many other research designs, should however not be ignored. One of the standard criticisms of case study research concerns its external validity or generalisability (Bryman, 2008). The findings derived from the case study provide little basis for generalisation (Yin, 1994). Exponents of case study research counter by saying that it is not the purpose of this research design to generalise to other cases or to populations beyond the case (Bryman, 2008). However, case study researchers are often in a position to generalise by drawing on findings from comparable cases investigated by others (Bryman, 2008). Case studies are therefore generalisable to theoretical propositions and not to populations or universes (Bryman, 2008; Yin, 1994).

5.5 Research instruments

As indicated earlier, this study adopted the mixed methods approach in data collection and analysis so as to address the research objectives and answer the research questions. de Vos et al (2011) define a mixed methods research as a type of research strategy in which both quantitative and qualitative approaches are used in data collection and analysis procedures in a single study. A household questionnaire (quantitative) was used together with key informant interviews, focus group discussions and observation (qualitative) for the collection of data. Various secondary data sources were also consulted.

Mixed methods research provides strengths that offset the weaknesses of qualitative and quantitative research and therefore has the potential to provide better inferences (Bryman, 2008). Combining qualitative and quantitative research helps in triangulating findings so that they may be mutually collaborated which brings with it greater validity (Bryman, 2008). The

researcher can bring together a more comprehensive account of the area of enquiry he or she is interested in if both qualitative and quantitative research methods are employed in a single study (Bryman, 2008). In addition, qualitative and quantitative research can each answer different research questions put forward by a study (Bryman, 2008). The above attributes of mixed methods research proved quite useful for the current study.

In spite of its relevance and rising popularity, the mixed methods approach has also been criticised. Some researchers argue that research methods carry epistemological and ontological commitments and therefore qualitative and quantitative research are separate paradigms and, as such, mixed methods research is not feasible or even desirable (Bryman, 2008; de Vos et al, 2011). In spite of increasingly becoming methodologically fashionable, mixed methods research is subject to the same considerations and constraints as mono-method research or any other research method or design. No single method should therefore be treated as being universally applicable panacea (Bryman, 2008; de Vos et al, 2011).

5.5.1 Primary data

Primary data were collected through the use of four instruments namely, household questionnaire, key-informant interviews, focus group discussions, and observation.

5.5.1.1 Questionnaire

A household questionnaire (Appendix A) was used as one of the sources of primary data. It targeted the Chizvirizvi community adjacent to MPWR and also the villagers within Mahenye ward. Closed-ended questions were used so as to facilitate the collection of quantitative data. The questionnaire was personally administered with the help of three trained research assistants in each of the two targeted communities. The questionnaire collected data on the socio-economic characteristics of the respondents such as, inter alia, age, marital status, level of education, household size, income sources and levels, type of dwelling and access to services (such as schools, health facilities, water, energy and sanitation). Data were also collected on the conservation status of conservation areas, the livelihood benefits and costs from conservation areas to local communities, hindrances to the flow of livelihood benefits from conservation, and measures to be adopted for enhancing benefits to local communities from conservation.

The questionnaire method was chosen because of its ability to collect large quantities of data over a larger sample in a shorter period of time (Bryman, 2008). The questionnaire was

piloted in November 2012 among a few households in both study sites so as to assess its effectiveness in data collection. This provided an opportunity to refine its wording and content. Piloting also proved to be quite useful in identifying the training needs of the research assistants who were to help in administering the questionnaire.

Weaknesses inherent in the questionnaire as a method of data collection include its inability to allow for the probing of respondents so as to get deeper and richer data (Bryman, 2008; de Vos et al, 2011). Qualitative research instruments therefore addressed this weakness of the questionnaire method of data collection.

5.5.1.2 Structured interviews

The interview method of collecting data in a face-to-face situation with key informants was also employed in this study. A prepared interview guide (Appendix B) was used during the interviews. However, flexibility was adopted so as to allow respondents to raise additional issues and for the interviewer to probe aspects further. This allowed for the gathering of additional information thereby enriching interviewee response.

For Mahenye, targeted key informants included the CAMPFIRE Committee Chairperson, selected committee members, resource monitors and the accounts clerk. Former CAMPFIRE committee chairpersons and committee members were also interviewed. The Chipinge District CAMPFIRE Coordinator and the Zimbabwe CA Coordinator were also interviewed so as to solicit their views on the CAMPFIRE project in Mahenye and the national CAMPFIRE programme respectively. Interviews were also held with the traditional leadership in Mahenye, including the Chief and selected village heads. School authorities, a representative from the Mahenye clinic, and also the Agricultural Research and Extension (AREX) officer for the area were also interviewed.

Interviews were also held with a representative from Zambezi Hunters, the current hunter for the Mahenye CAMPFIRE project. A representative of the Chilo Lodge, which oversees ecotourism activities in Mahenye was also interviewed. Ecotourism, photographic hunting, and trophy hunting are the main sources of income for the Mahenye CAMPFIRE project. Interviews were also held with a representative from CASS based at the University of Zimbabwe which is one of the organisations that played a pivotal role in the formative years of the national CAMPFIRE programme. Unfortunately, other NGOs that had played key roles in the establishment of CAMPFIRE were no longer operational.

In MPWR, interviews were held with the Director, the Resident Ecologist, the Human Resources Manager, the Community Outreach Officer, and selected game guards. In Chizvirizvi, the community adjacent to MPWR, key informants included the Chief, Chief Thsovani, selected village chairpersons, the Councillor, school heads or their representatives, and the sister in charge at Chizvirizvi clinic. The other key informants in Chizvirizvi included representatives from selected feeding points for the feeding scheme being bankrolled by MPWR, and the AREX officer for the area.

Information solicited through the structured interviews included the conservation status of conservation areas, the livelihood benefits and costs from conservation areas to local communities, hindrances to the flow of livelihood benefits from conservation to communities, and measures to be adopted for enhancing benefits to local communities from conservation. The interview guides were designed so as to allow for the collection of the same information from both study areas so as to allow for comparisons. Questions for interviewees were selected basing on their position or status within their communities or organisations and therefore not everyone was asked the same questions.

5.5.1.3 Focus group discussions

Focus group discussions were also organised through local leaders such as chiefs and headmen, with the local communities adjacent to (Chizvirizvi) or within (Mahenye) the two conservation areas (Appendix C). Focus group discussions were used in this study because they promote self-disclosure among participants through group dynamics (Hennink et al, 2011). This provided an environment for participants to reveal what they really feel and think about conservation activities in their areas in relation to livelihoods. More specifically, the group discussions were useful in gathering the opinions and attitudes of the people towards conservation as such qualitative information is best collected through qualitative research instruments such as group discussions.

Two group discussions were held, one in Mahenye and the other in Chizvirizvi. Just like with the structured interviews, there was flexibility so as to allow for participants to air out other relevant views.

5.5.1.4 Non-participant unstructured observation

The researcher also employed simple observation as a data collection method. Non-participant observation is where the observer observes but does not participate in what is going on in the social setting (Bryman, 2008). Observation was also unstructured as the researcher did not use an observation schedule for the recording of behaviour. The researcher tried as much as possible to be unobtrusive and not be observed by his targets of observation. This was aimed at attempting to avoid a situation whereby people would change their behaviour because they knew they are being observed, a concept referred to as the 'reactive effect' (Bryman, 2008). More often than not, observation was used simultaneously in conjunction with the other data collection methods.

Observation proved quite useful for the researcher. For instance, observation was used as a means of verifying some of the information collected through the other data collection instruments. Among some of the things that were observed include livelihood strategies of local communities, the status of biodiversity in conservation areas, and costs and benefits to communities from conservation. In other words, the observation method contributed immensely towards addressing all the research objectives and answering the research questions.

5.5.2 Document analysis

Various secondary sources of information of relevance to the study were also accessed and analysed so as to help in meeting the objectives of the study. These included both published and unpublished documents. Key among these documents included those kept at the two conservation areas, relevant government policy documents, documents kept by other relevant private organisations, journal articles, conference and seminar proceedings, books and websites. These were critically reviewed so as to yield relevant discussions on biodiversity conservation and rural livelihoods enhancement. The information from the secondary sources was corroborated with that obtained through the other data collection sources. This enabled the generation of more varied and hence more valid information upon which sound discussions and conclusions could be based.

5.6 Sampling

Financial, personpower and temporal constraints could not allow the researcher to solicit for information on conservation and livelihoods in the targeted research sites from everyone. Sampling was therefore employed so as to draw representative samples from the target populations.

Starting with the household questionnaire, representative samples were drawn from the Mahenye ward and Chizvirizvi community so as to gather socio-economic data representative of the situation in these communities. The sampling frame for Mahenye were the approximately 1 000 households in the ward and 150 households, representing 15% of the total household population, were selected for questionnaire interviews. For Chizvirizvi, the approximately 300 households constituted the sampling frame from which another 150 households were also selected for interviews. The drawing of similar sample sizes (in terms of absolute numbers) was necessitated by the need to enhance comparability. Simple random sampling was employed in selecting households into the samples. However, to ensure that the samples were drawn uniformly from across whole study sites, sampling was conducted at village level. Fifteen households were therefore randomly selected out of each of the 10 villages of Chizvirizvi, while 30 households were randomly selected from each of the 5 villages of Mahenye ward. An adult in each household, most preferably the household head, was the prime target for interviewing. Where no suitable person could be found for interviews (for example, a child under 18 years), another household was randomly selected. This was done so as to ensure the collection of reliable information. A 10% sample is considered sufficient for controlling for sampling errors (de Vos et al, 2011; Hennink et al, 2011).

For the key informants, purposive sampling was employed. Purposive sampling is a particular technique that aids the researcher in identifying individuals for interviewing according to the research topic and objectives (de Vaus, 2002). The snowballing technique was further used for identifying additional participants through individuals already interviewed (Somekh and Lewin, 2005). Simple random sampling was however used in selecting village leaders for interviews. Three village heads and three village chairpersons were selected from Mahenye and Chizvirizvi respectively. Selection was done through two separate raffles in which three assistants in each raffle were asked to randomly pick a single card each bearing the name of a village leader.

A total of 15 people were included in each of the two group discussions that were separately held in Mahenye and Chizvirizvi. The older, the younger, men, women, the richer and the poorer were all represented in these group discussions through purposive sampling organised with the help of community leaders. This ensured the capturing of a wide diversity of views on conservation and livelihoods from the two study sites. Precaution was taken to ensure that everyone in the groups had an equal chance to express their views.

5.7 Data analysis procedure

The Statistical Package for the Social Sciences (SPSS) was used as the main tool for quantitative data analysis. Simple descriptive statistics were employed in describing and investigating the responses among several choices given to interviewees on the questionnaire. These included the mean, mode, range and percentage frequency. The findings were presented using tables. For multiple response questions, relative frequencies in percentage were calculated on the basis of the number of respondents giving each response, which is why the sum of responses per question with multiple responses exceeded 100%.

Qualitative data from group discussions, structured interviews, and observation were analysed into various conceptual or thematic categories in line with the research objectives. Data acquired from document analysis was synthesised into emerging themes and was used to reinforce or clarify ideas emerging from the primary data sources.

The constant comparative approach was used in comparing the two case study sites regarding conservation and livelihoods using the data synthesised from the various sources. The conclusions of this study were thus based on varied evidence from the multiple sources of information used in the study.

5.8 Conclusion

This chapter has presented the methodological approach used in data collection and analysis to aid in addressing the research questions and objectives of the study. The chapter has also provided a detailed description of the study areas. The following chapter now presents and analyses the findings of the study.

CHAPTER SIX: RESULTS, DISCUSSION AND COMPARATIVE ANALYSIS

6.1 Introduction

This chapter presents, analyses and discusses the results of the study. A comparative analysis of the key findings and trends from the study sites is also provided.

As a recap, the study investigates the impacts of two conservation areas, a community-based conservation area (Mahenye) and a privately-owned conservation area (Malilangwe), on the livelihoods of nearby communities. The adjacent Chizvirizvi resettlement area was selected as a representative community for investigating the livelihood impacts of Malilangwe on local communities. Since Mahenye is a community-conserved area, the investigation of its impacts on local livelihoods was therefore confined to the same area.

A total of 300 local community households (150 in Mahenye and 150 in Chizvirizvi) were selected for questionnaire interviews. These, together with key-informant interviews, group discussions, secondary data and field observations were instrumental in gathering the data presented, analysed and discussed in this chapter, and are used corroboratively in addressing the research objectives and answering the research questions.

6.2 Demographic and socio-economic characteristics of respondents

The study sought to describe the demographic and socio-economic characteristics of communities adjacent to the conservation areas, the ultimate goal being to establish current and desired livelihood strategies and levels of socio-economic development. The findings are presented below.

6.2.1 Demographic profile of respondents

The overall gender distribution of community household respondents (Table 6.1) shows an even balance, with slightly more males (50.7%) than females (49.3%). There were, however, some disparities in the gender distribution of the respondents in the two study sites. There was a higher gender representation for males (56%) than females (44%) in Mahenye, while in Chizvirizvi there were more females (54.7%) than males (45.3%).

Table 6.1: Gender distribution of respondents (in %)

Gender	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Male	56.0	45.3	50.7
Female	44.0	54.7	49.3
Total	100	100	100

Gender issues are important in biodiversity conservation and environmental management (Feresu, 2010; Makindi, 2010). In Zimbabwe's rural areas, women are at the forefront of environmental use and management through their involvement in agricultural production and through the harvesting of various natural resources (Cavendish, 2000; Feresu, 2010). The 2002 census showed that there were more females (52%) than males (48%) in Zimbabwe, while the recent 2012 census also showed a dominance of females in the gender representation of the country both at provincial and national levels. However, despite their higher numbers, women are not treated equally with men in Zimbabwe as evidenced by a low gender-related development index (GDI) and also a low gender empowerment measure (GEM) (Lopez-Claros, 2005; UNDP, 2007). "The low GDI and GEM reflect the general low status of women with respect to access, control and ownership of economic resources and positions in decision-making processes" due to "patriarchy, cultural constraints and an electoral system that does not adequately support women participation" (Feresu, 2010: 24). Studies in Zimbabwe and elsewhere have revealed that women's participation in the rural economy is largely confined to agricultural production for domestic consumption and the collection of wild resources for immediate household-level food security (Cavendish, 2000; Sunderland et al, 2014). In addition, the traditional land tenure system in Zimbabwe's communal areas does not allow women to own land (Government of Zimbabwe, 1998). The higher number of female respondents in Chizvirizvi was partly due to the fact that some men have gone to work in neighbouring South Africa leaving their wives in charge of their households. In contrast, the relative isolation of Mahenye from the major urban centres of the country (Mashinya, 2007; Murphree, 2001) has helped in maintaining a more patriarchal society. Feresu (2010) notes that key gender issues that impact on the environment in Zimbabwe are related to access and ownership of resources and, therefore, women should more centrally be involved in the development and management of environmental policies, programmes and projects. Evidence around the world indicates that women, particularly in female-headed households, are largely marginalised from the livelihood benefits of most conservation projects due to discrimination based on gender (Leisher et al, 2010).

The overall average age (x) for the study sites (Table 6.2) was 47.3 years, with the respondents more or less evenly distributed throughout the six age groups except for age group 18-25 years which constituted only 5% of the respondents, while the largest number of the respondents (24%) fell within the 36-45 years age group. Mahenye had an average age of 49.3 years, with the largest number of the respondents (26%) falling within the 46-55 years age group, while only 2.7% of the respondents were in the 18-25 years age group. For Chizvirizvi, a slight majority of the respondents (30.7%) were in the 36-45 years age group, while 7.3% of the respondents fell within the 18-25 years age group. The lower number of respondents in the 18-25 years age group for both study sites was most probably due to the fact that the majority of people in this age group would not yet have started their own families, with many still in school.

Table 6.2: Age distribution of respondents (in %)

Age	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
18-25	2.7	7.3	5.0
26-35	16.0	17.3	16.7
36-45	17.3	30.7	24.0
46-55	26.0	16.7	21.3
56-65	18.7	10.7	14.7
>65	19.3	17.3	18.3
Total	100	100	100
	x = 49.3	x = 45.3	x = 47.3

The difference in the average ages between Mahenye (49.3 years) and Chizvirizvi (45.3 years) could possibly be explained by the fact that Chizvirizvi only came into existence in 2000 and, being a resettlement area, settler selection was obviously biased towards economically active people in their prime. On the other hand, Mahenye, a communal area which has existed since the 1920s, has more people within the older age groups compared to Chizvirizvi as shown in Table 6.2.

Just like gender above, age may also affect access, control and benefit from resources, with the younger members of society being marginalised. This may particularly be crucial among child-headed households, who may be excluded from benefiting from various community development activities, including conservation-livelihoods initiatives. The advent of the Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome (HIV/ AIDS) has seen an increase in the number of child-headed households, with a study by the UN

International Children's Emergency Fund (UNICEF) in 2007 revealing that 1 million orphans (aged 0-17) lost their parents due to HIV/ AIDS in Zimbabwe against 1.3 million by all other causes combined (Feresu, 2010). The 2012 Population Census reported that 20% of children under 17 years of age were orphaned (Central Statistical Office, 2012).

With respect to education (Table 6.3), 18.7% of the overall community respondents had not attained any form of formal education, while the rest of the respondents (81.3%), had some formal education. For Mahenye, 22% of the respondents had no formal education while the largest number of the respondents (31.3%) had reached the upper primary (grade 5-7) level of education. For Chizvirizvi, 15.3% of the respondents had no formal education, with the largest number of the respondents (24%) having attended junior high school (form 1-3). A common trend for both study sites was the general decline in the number of respondents as education level increased. There were more respondents in the lower education levels in Mahenye, while Chizvirizvi had more respondents in the higher levels of education except at the degree level, where 0.7% of the respondents in Mahenye had a degree while no respondents in Chizvirizvi had degrees. Seventy eight percent and 84.7% of the respondents in Mahenye and Chizvirizvi had attained some formal education respectively. Interviews with school authorities in Mahenye revealed that some parents in the area still do not value the importance of educating their children, especially girls, which partly explains the slightly lower numbers of people with formal education compared to Chizvirizvi.

Table 6.3: Respondents' level of education attained (in %)

Level of education attained	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
No formal education	22.0	15.3	18.7
Lower primary (grade 1-4)	22.7	10.0	16.3
Upper primary (grade 5-7)	31.3	18.0	24.7
Junior high (form 1-3)	15.3	24.0	19.7
Senior high (form 4-6)	7.3	22.7	15.0
Certificate	0.7	6.0	3.3
Diploma	-	4.0	2.0
Degree	0.7	-	0.3
Total	100	100	100

Zimbabwe has done quite well in education in comparison to other human development indices, and is among the countries with the highest literacy levels in Africa. This has mainly been achieved through the Universal Primary Education Policy which the country adopted

soon after independence in 1980. The 2012 Population Census reported a 96% literacy rate for Zimbabwe (Central Statistical Office, 2012). The Zimbabwe Demographic Health Survey of 2005-2006, however, found the overall literacy rate for women (91%) to be slightly lower than that of men (95%), while literacy was also shown to decrease with age for both sexes (Central Statistical Office and Macro International Inc., 2007). This relatively lower literacy rate for women is cause for concern as it has been shown earlier that women are at the forefront in environmental use and management in Zimbabwe. The importance of education lies in the fact that it shapes people's attitudes and beliefs that determine many activities that impact the environment, with educated people better able to understand the need for environmental management or for supporting conservation activities (Mjaaland, 2014). However, environmental awareness alone is not adequate in effecting attitude change on communities to engage in sustainable environmental management practices, hence the need to offer incentives for sound environmental management (Feresu, 2010).

The other importance of education, particularly in rural communities where conservation and livelihoods goals are being pursued simultaneously, is that it can enable local people to secure conservation employment. Very often, local communities fail to secure higher-paying conservation jobs due to lack of, or lower education, with such jobs eventually taken by outsiders (Borgerhoff Mulder and Coppolillo, 2005; Leisher et al, 2010). Such jobs could act as a strong incentive for environmentally sound behaviour among local communities. In addition, education, particularly that of the girl child, may act as 'contraception' by delaying marriage, resulting in smaller family sizes (Mjaaland, 2014). This will in turn lower population growth rate leading to reduced demand for natural resources, thereby making it feasible to attain sustainable development.

The study also sought to establish the marital status of the respondents and the results are presented in Table 6.4. Overall, most of the survey respondents (75.3%) were married. The majority of the respondents in both Mahenye (74%) and Chizvirizvi (76.7%) were married, while widowhood was the second largest marriage category for respondents in the two study sites constituting 14% of the respondents in each area. There were no single respondents in Chizvirizvi, while 3.3% of the respondents in Mahenye were single. Similarly, there were no respondents falling within the never married category in Mahenye, while 4% of the respondents in Chizvirizvi were in this category. Six percent of the respondents in Mahenye

and 1.3% of the respondents in Chizvirizvi were separated, while 2.7% and 4% of the respondents were divorced in Mahenye and Chizvirizvi, respectively.

Table 6.4: Marital status of respondents (in %)

Marital status	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Single	3.3	-	1.7
Married	74.0	76.7	75.3
Separated	6.0	1.3	3.7
Divorced	2.7	4.0	3.3
Widowed	14.0	14.0	14.0
Never married	-	4.0	2.0
Total	100	100	100

A study in the 1980s in sub-Saharan Africa revealed a universality of the marriage institution in the region (as opposed to celibacy) which was further reinforced by high rates of remarriage after divorce or widowhood, and also by a higher prevalence of polygamous marriages (Bongaarts et al, 1984). The relatively high incidence of widowhood for both study sites (14%), is important as it helps in reinforcing an earlier observation that women, and female-headed households in particular, tend to be marginalised when it comes to access to economic resources, including benefits from conservation-livelihoods initiatives. In light of the above, it is important to note that the 2012 Population Census for Zimbabwe reported that more females were widowed compared to males (Central Statistical Office, 2012).

Results on respondents' household sizes (Figure 6.5) indicate that the overall average household size (x) was 7.7, with the modal or most occurring household size (20%) being 10 members. The overall minimum and maximum household sizes were 1 and 15, respectively, giving a range (r) of 14.

Table 6.5: Respondents' household sizes (in %)

Household size	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
1	0.7	-	0.3
2	2.7	0.7	1.7
3	5.3	4.7	5.0
4	4.7	14.0	9.3
5	8.0	10.7	9.3
6	10.7	8.0	9.3
7	8.0	11.3	9.7
8	16.0	10.0	13.0
9	10.7	7.3	9.0
10	15.3	24.7	20.0
11	9.3	2.7	6.0
12	6.0	4.7	5.3
13	2.0	0.7	1.3
15	0.7	0.7	0.7
Total	100	100	100
	x = 7.9 r = 14	x = 7.5 r = 13	x =7.7 r = 14

Mahenye had an average household size of 7.9, with 8 being the modal household size (16%). For Chizvirizvi, the average household size was 7.5 while the modal household size (24.7%) was 10. The largest household size recorded in Mahenye was 15 members while the lowest was 1, giving a range of 14. Chizvirizvi had a maximum household size of 15 members and a minimum household size of 2 members, giving a range of 13. The 2012 Population Census recorded an average household size of 4.2 (Central Statistical Office, 2012) and, therefore, the average household sizes for the two study sites are far much higher than the national average.

The relatively large household sizes for the two study sites have some important implications for biodiversity conservation and livelihoods. First, this translates into increased demand for natural resources as livelihood sources, consequently exposing such resources to possible overexploitation. It is important to note that the majority of rural households in Zimbabwe depend on natural resources for their sustenance (Cavendish, 2000; Maroyi, 2011; Mutenje et al, 2011). Second, the high average household sizes mean that any livelihood benefits from conservation-development initiatives will have to be shared among more people, thereby diluting the livelihood impacts of such benefits. This may eventually act as a disincentive for

environmentally sustainable behaviour among local residents, including reduced local support for conservation activities. Studies by Agrawal (2001; 2003) identified small community size as one of the key conditions favouring the success of community conservation initiatives.

6.2.2 Socio-economic profile of respondents

The study also sought to assess the socio-economic characteristics of the respondents in Mahenye and Chizvirizvi and the results of this inquiry are presented below.

6.2.2.1 Respondents' main livelihood occupation

All the respondents in Mahenye and Chizvirizvi cited farming as their main livelihood-supporting occupation. The respondents were further asked about the specific type of farming they practised and the overall response for the two study sites indicated subsistence crop and livestock production (86%) to be the main type of farming practised, while the other respondents (14%) were practising subsistence crop production (Table 6.6). Agriculture is the main occupation for the majority of people in the communal areas of Zimbabwe, and is mainly practised on a subsistence basis due to lack of resources and the unsuitability of agro-ecological conditions (Cavendish, 2000; Stack and Sukume, 2006). While farmers in resettlement areas like Chizvirizvi may seem better in terms of farm size and, to some extent, agro-ecological suitability, they also often lack the same key farming resources such as cash and machinery, with many farming on subsistence basis. While most people in the study areas were subsistence farmers, some interviewed respondents, particularly in Chizvirizvi, noted that they occasionally produced some surplus for sale during good seasons.

Table 6.6: Type of farming practised (in %)

Type of farming practised	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Subsistence crop production	28.0	-	14
Subsistence crop and livestock production	72.0	100	86.0
Total	100	100	100

The overall average landholding size (x) for the survey respondents was 38.6 hectares (Table 6.7). However, there was a marked disparity in the sizes of landholdings between the two study sites. For Mahenye, the average arable land size per household was 2.3 hectares. Ninety percent of the respondents in Mahenye had land sizes of between 1 and 5 hectares, while the

remaining 10% had less than 1 hectare of arable land. The maximum and minimum land sizes reported were 2.5 and 0.5 hectares, respectively, giving a range (r) of 2 hectares. The average land size per household in Chizvirizvi was 74.9 hectares. The maximum and minimum land sizes reported by respondents in Chizvirizvi were 88 and 58 hectares respectively, giving a range of 30 hectares.

Table 6.7: Size of landholding (ha) (in %)

Size of landholding	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
<1	10.0	-	5.0
1-5	90.0	-	45.0
56-60	-	10.0	5.0
61-65	-	2.7	1.3
66-70	-	14.0	7.0
71-75	-	9.3	4.7
76-80	-	42.0	21.0
81-85	-	21.3	10.7
86-90	-	0.7	0.3
Total	100	100	100
	x = 2.3 r = 2	x = 74.9 r = 30	x = 38.6 r = 87.5

A 1989 survey established that 70% of communal households had access to only 2.5 ha of arable land with the remaining 30% having less than 1,5 ha (Chenje et al, 1998). One of the aims of the resettlement programme in post-independence Zimbabwe was to relieve population pressure in the communal areas, and, in light of the above, this has obviously not yet been realised in Mahenye and many other communal areas of the country. Communal area inhabitants also do not have title to the land but only have usufructory rights to it, while farmers in the resettlement areas such as Chizvirizvi farm the land on leasehold. All the land in the communal and resettlement areas is vested in the state. It is often argued that the communal and leasehold tenure systems are a disincentive to long-term investment in agriculture and other key natural resources, while freehold tenure provides land owners with incentives to conserve and improve the natural resource base (Government of Zimbabwe, 1998; Megersa et al, 2014). In a bid to address the above land tenure related problems, the Zimbabwe government set up a Land Tenure Commission in 1994 so as to review the land tenure systems and make recommendations (Land Tenure Commission, 1994). However, no such recommendations have been implemented (let alone revealed) to date. It is important to

note that the issue of tenure is of central concern and debate in the ongoing land reform in Zimbabwe as government seems reluctant to give title to newly resettled farmers.

The above land tenure conditions in the study areas have some important implications on biodiversity conservation and livelihoods. First, as shown earlier, lack of tenure in both communities predisposes natural resources to degradation due to the general absence of a sense of individual accountability for a particular piece of land among residents. Second, the small landholdings in Mahenye translate into reduced food security for the residents, resulting in a disproportionate dependence on biodiversity for livelihoods. It is important to note that over-reliance on natural resources by poor rural households across the world has been identified as one of the major straining factors on the environment (Adams et al, 2004; Nadkarni, 2000; Pinho et al, 2014; Roe and Elliot, 2005; Vira and Kontoleon, 2010).

Table 6.8 presents the livestock ownership status of the respondents in the study sites. Sixty four percent, 65.3% and 56.7% of the respondents in Mahenye owned poultry, cattle and goats respectively. Again in Mahenye, 20%, 17.3% and 13.3% of the respondents said they owned donkeys, sheep and pigs respectively. In Chizvirizvi, 98.7%, 96% and 95.3% of the respondents owned poultry, cattle and goats respectively, while 14.7% owned donkeys, 56% owned sheep and 2.7% owned pigs. With the exception of pigs and donkeys, there were more respondents owning each of the various types of livestock in Chizvirizvi than in Mahenye.

Table 6.8: Types of livestock reared (in %): multiple responses

Livestock reared	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Cattle	65.3	96.0	80.7
Goats	56.7	95.3	76.0
Sheep	17.3	56.0	36.7
Pigs	13.3	2.7	8.0
Poultry	64.0	98.7	81.3
Donkeys	20.0	14.7	17.3

Livestock rearing is an important economic activity in both communal and resettlement areas in Zimbabwe. Cattle, in particular, have a multiplicity of functions including the provision of draught power, provision of manure, supply of milk and meat, sale of stock to meet urgent cash needs and payment of lobola among other socio-economic and cultural roles (Chenje et al, 1998; Scoones and Wilson, 1989). From their studies on the Borana community of southern Ethiopia, Megersa et al (2014: 1) similarly concluded that cattle ownership

“constitutes an integral part of the social, economic and ritual life of the people. An individual without cattle may not qualify to fulfil the requirements of certain social standards or to execute certain social obligations”. For example, lack of draught power can result in low crop yields for affected households due to late planting as they wait for those households with draught power to finish ploughing their fields first.

The overall average number of cattle per household among those households owning cattle was 11.4, with a range of 71 (Table 6.9). The average number of cattle owned by cattle-owning households in Mahenye was 11. The minimum number of cattle owned by a household in Mahenye was 1 while the maximum was 52, giving a range of 51. For Chizvirizvi, the average number of cattle per household for cattle-owning households was 11.8. The minimum number of cattle owned by a household in Chizvirizvi was 1 while the maximum was 72, giving a range of 71. Resettlement farmers are generally better off compared to communal farmers in terms of resource ownership which explains why there was a higher percentage of respondents owning cattle (and a higher average number of cattle per household) and other livestock in Chizvirizvi than in Mahenye.

Table 6.9: Number of cattle owned (in %)

Number of cattle per household	Mahenye (n=98)	Chizvirizvi (n=144)	Total (n=242)
1	1.0	0.7	0.8
2	11.2	6.3	8.3
3	4.1	2.8	3.3
4	8.2	6.9	7.4
5	5.1	6.9	6.2
6	6.1	6.9	6.6
7	5.1	2.1	3.3
8	7.1	11.1	9.5
9	5.1	4.9	5.0
10	13.3	14.6	14.0
11	4.1	1.4	2.5
12	7.1	4.2	5.4
13	-	2.8	1.7
14	1.0	3.5	2.5
15	1.0	4.2	2.9
16	3.1	2.8	2.9
17	-	0.7	0.4
18	2.0	2.1	2.1
19	2.0	-	0.8
20	3.1	5.6	4.5
21	1.0	-	0.4
22	2.0	-	0.8
23	1.0	-	0.4
25	-	1.4	0.8
28	-	1.4	0.8
30	-	3.5	2.1
32	1.0	0.7	0.8
34	-	0.7	0.4
40	3.1	-	1.2
45	-	0.7	0.4
49	1.0	-	0.4
50	-	0.7	0.4
52	1.0	-	0.4
72	-	0.7	0.4
Total	100	100	100
	x = 11 r = 51	x = 11.8 r = 71	x = 11.4 r = 71

However, livestock rearing, and in particular cattle production, has since been cited as a major cause of land degradation in Zimbabwe and elsewhere, especially in the communal areas (Megersa et al, 2014; Stocking, 1980). Due to the multiple-purpose role of cattle, the level of stocking among communal farmers is determined by economic objectives rather than by scientific livestock management principles which take into consideration the carrying capacity of the land (Scoones and Wilson, 1989). Chenje et al (1998) note that communal farmers in Zimbabwe keep large and mixed species stock as a survival strategy. Similar studies in East Africa by Tsegaye et al (2013) also revealed that the Afar community survived by keeping multispecies of livestock, with small stock such as goats and sheep occasionally sold for cash income.

The implications of livestock rearing on biodiversity conservation and livelihoods in the study sites are manifold. First, as already shown, livestock rearing, if practised within the carrying capacities of the study areas, will certainly help in reducing over-reliance on biodiversity for livelihoods by residents thereby helping in achieving environmental sustainability. On the other hand, overshoots of the ecological capacities of the study areas by livestock will result in ecological degradation through overgrazing, which will in turn result in a negative feedback on livelihoods. In addition, overstocking will eventually endanger the conservation areas in or adjacent to the study areas as residents seek to graze their livestock in the protected areas. This highlights the need to regulate livestock rearing in the study sites.

In response to challenges faced in farming (Table 6.10), 64% of the respondents in Mahenye cited lack of resources, 95% cited destruction of crops by wildlife, while 87.3% indicated aridity as major challenges hindering farming. The major challenges to farming in Chizvirizvi included lack of resources (58.7%), lack of farming skills and resources combined (41.3%) and aridity (99.3%). Shortage of land was not an issue at all in farming among the respondents in Chizvirizvi while 8.7% of the respondents in Mahenye cited this as a challenge.

Table 6.10: Challenges faced in farming (in %): multiple responses

Challenges in farming	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Shortage of land	8.7	-	4.3
Lack of farming skills	4.0	-	2.0
Lack of resources	64.0	58.7	61.3
Lack of farming skills and resources	26.0	41.3	33.7
Destruction of crops by wildlife	95.3	17.3	56.3
Aridity	87.3	99.3	93.3

Aridity was a major challenge to farming in both study sites as they are situated in agro-ecological regions IV and V receiving rainfall of less than 650 mm per year**.** While the soils in Chizvirizvi are relatively fertile, low rainfall was the major hindrance to farming in the area. Destruction of crops by wild animals was the most cited challenge to farming among respondents in Mahenye (95.3%), while 17.3% of the respondents in Chizvirizvi cited it as a challenge. The above challenges, particularly lack of resources and aridity, have restricted the residents of the two study sites to subsistence farming (Table 6.6). The reliance on subsistence farming among the residents of Mahenye and Chizvirizvi in turn increases the significance of natural resources to the livelihoods of the people, which predisposes natural resources in these areas to overexploitation. In addition, the destruction of crops by wildlife further reduces the already low yields, which might result in negative attitudes towards conservation and wildlife. This requires the conservation areas to meaningfully contribute to the livelihoods of the local communities.

Respondents were asked whether they longed to engage in any other economic activity besides their current main livelihood-sustaining occupation of subsistence farming and their responses are presented in Table 6.11. Ninety eight percent of the respondents in Mahenye indicated that they longed to engage in a different main occupation while all the respondents in Chizvirizvi longed to have a different main economic activity.

Table 6.11: Whether respondents longed to engage in any other economic activity (in %)

Desire to engage in other economic activity	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Yes	98.0	100	99.0
No	2.0	-	1.0
Total	100	100	100

The results presented in Table 6.11 suggest an overall dissatisfaction with subsistence farming as the current main livelihood-supporting activity in the two study sites. The respondents who desired to engage in other economic activity were further asked to indicate which economic activities they would like to be involved in (Table 6.12) and 56.4%, 17% and 26.5% of the respondents in Mahenye indicated commercial farming, professional employment and the running of business, respectively, as the desired alternative economic activities. For Chizvirizvi, 42%, 20.7% and 37.3% of the respondents desired to engage in commercial farming, professional employment and the running of business as alternatives to subsistence farming, their current main economic activity.

Table 6.12: If respondents desired to engage in other economic activity, type identified (in %)

Economic activity desired	Mahenye (n=147)	Chizvirizvi (n=150)	Total (n=297)
Commercial farming	56.4	42.0	49.2
Professional employment	17.0	20.7	18.9
Run business	26.5	37.3	31.9
Total	100	100	100

Various factors were, however, cited by those respondents longing to engage in an alternative economic activity as hindrances to engaging in the desired economic activity (Table 6.13). Overall, 43.7% of the respondents indicated lack of skills and resources as the main hindrance to engaging in the longed-for economic activity.

Table 6.13: If respondents desired to engage in other economic activity, hindrance faced (in %)

Hindrance	Mahenye (n=147)	Chizvirizvi (n=150)	Total (n=297)
Lack of resources	44.9	35.3	40.1
Lack of skills	6.8	11.3	9.1
Lack of skills and resources	45.6	42.0	43.7
Lack of infrastructure	2.0	1.3	1.7
Lack of energy/electricity	-	1.3	0.7
Lack of employment opportunities	0.7	8.7	4.7
Total	100	100	100

For both study sites, lack of resources and lack of skills and resources combined were the most cited hindrances to engaging in the desired economic activity among the respondents.

Among the respondents in Chizvirizvi who desired to engage in other economic activities, 8.7% of them cited lack of employment opportunities as a hindrance, while in Mahenye 0.7% of these cited lack of employment opportunities as a hindrance. This difference in responses among the respondents in the two study sites was due to the fact that there were more respondents with higher-level academic qualifications in Chizvirizvi than in Mahenye (Table 6.3).

The above results on the longed-for economic activities among the residents in the study areas have important implications on biodiversity conservation and livelihoods. With 56.4% and 42% of the respondents in Mahenye and Chizvirizvi, respectively, indicating that they desired to engage in commercial farming, this might indicate the need to clear more land for farming in the study areas unless the people are resettled elsewhere. It is important to note that, when asked whether they wanted to move out of their current area of residence, only 4% of the respondents in Mahenye indicated that they wanted to move, while no respondent in Chizvirizvi indicated a desire to move. With many protected areas in Zimbabwe having been earmarked for resettlement in the ongoing land reform programme (Bond and Cumming, 2006; Makadho, 2006), the conservation areas in the study sites are certainly not immune to this risk of increased demand for agricultural land. The many challenges identified above by the respondents as hindrances to desired alternative economic activities also translate into continued reliance on subsistence farming as the main livelihood activity. The conservation and livelihood impacts of relying on subsistence farming in the study areas have already been highlighted.

6.2.2.2 Household income status

When asked about sources of household income (Table 6.14), respondents indicated various sources, with farming being, overall, the most cited (87%) household income source. The main income sources in Mahenye were farming (74%), selling of crafts or wild resources (55.3%) and fishing (50.7%), while in Chizvirizvi, farming (100%) and selling of crafts or wild resources (55.3%) were the main sources of household income. With farming, selling of crafts or wild resources and fishing identified as the main income sources in the study areas, the implications on biodiversity conservation are significant as all these livelihood activities are based on access to and utilisation of biodiversity resources. The main income generating activities in the study areas thus have potential to lead to natural resource overexploitation and degradation if not regulated. Ten percent of the respondents in Chizvirizvi and 16.7% of

the respondents in Mahenye indicated wages as an income source. Twenty five percent of the respondents in Mahenye and 34.7% of the respondents in Chizvirizvi cited remittances as a source of household income. Forty five percent of the respondents in Chizvirizvi and 28.7% of the respondents in Mahenye indicated other sources of household income ranging from brick moulding, thatching of houses, selling clothes, ploughing people's fields, shoe repairing, selling traditional beer, selling paraffin through to tailoring. Some of these activities also rely on the utilisation of biodiversity resources.

Table 6.14: Sources of household income (in %): multiple responses

Household income sources	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Farming	74.0	100	87.0
Wage	16.7	10.0	13.3
Remittances	25.3	34.7	30.0
Pension	4.7	2.7	3.7
Grants	0.7	-	0.3
Fishing	50.7	31.3	41.0
Selling of crafts/wild resources	55.3	56.0	55.7
Other	28.7	45.3	37.0

The majority of the respondents in Mahenye (51.3%) and in Chizvirizvi (64.7%) had 3 household income sources (Table 6.15). There were fewer households in Mahenye (8%) and Chizvirizvi (2.7%) with a single income source. The reported maximum and minimum numbers of income sources per household for both study sites were 4 and 1, respectively, giving a range of 3. The average number of income sources per household in Mahenye was 2.6 while it was 2.8 in Chizvirizvi.

Table 6.15: Number of income sources per household (in %)

Number of income sources	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
1	8.0	2.7	5.3
2	32.0	23.3	27.7
3	51.3	64.7	58.0
4	8.7	9.3	9.0
Total	100	100	100
	x = 2.6 r = 3	x = 2.8 r = 3	x = 2.7 r = 3

Rural households in Zimbabwe have been reported to rely on various sources of income as a survival strategy and the results in Table 6.15 seem to confirm this. While agriculture plays a vital role as an income source among rural households (Table 6.14), the contribution of non-farm income sources, remittances and activities based on environmental resources has increasingly been recognised particularly among the poorer households (Stack and Sukume, 2006).

The majority of the respondents in Mahenye (67.3%) and Chizvirizvi (62.7%) had a household income of less than US$50. There were slightly more households represented in the higher income categories in Chizvirizvi than in Mahenye. The average monthly household income in Mahenye was US$72.7 while in Chizvirizvi it was US$75.1. The monthly household income ranges for Mahenye and Chizvirizvi were US$350 and US$465, respectively.

Table 6.16: Respondents' household monthly income (US$) (in %)

Household monthly income	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
<50	67.3	62.7	65.0
50-100	8.7	16.7	12.7
101-150	9.3	8.0	8.7
151-200	2.0	2.7	2.3
201-250	6.0	-	3.0
251-300	4.0	6.0	5.0
301-350	0.7	1.3	1.0
351-400	2.0	1.3	1.7
>400	-	1.3	0.7
Total	100	100	100
	x = 72.7 r = 350	x = 75.1 r = 465	x = 73.9 r = 465

Dividing the average household monthly income of US$72.7 for Mahenye with the area's average household size of 7.9 members (Table 6.5) would give a per capita monthly average income of US$9.2 which, further calculated, would give a daily per capita income of US$0.31. Similarly, dividing the average household monthly income of US$75.1 for Chizvirizvi with the area's average household size of 7.5 members (Table 6.5) would give a per capita monthly average income of US$10 which, further calculated, would give a daily per capita income of US$0.33. If the above calculations are anything to go by, it means that the majority of the residents of the two study sites are living on less than a dollar a day, and

are therefore part of the 1.1 billion people across the globe living in extreme poverty (Perera and Lee 2013; Ramchandani and Karmarkar, 2014; UNDP, 2010).

When asked to rate the poverty levels of their households (Table 6.17), 30.7% of the respondents and 58.7% of the respondents in Mahenye and Chizvirizvi respectively indicated the poverty levels of their households to be high, while 46.7% of the respondents in Mahenye and 12.7% of the respondents in Chizvirizvi indicated household poverty levels to be very high. In other words, 77.4% of the respondents in Mahenye and 71.4% of the respondents in Chizvirizvi rated the poverty levels in their households between high and very high. This, in a way, vindicates the low per capita income estimates for the residents of Mahenye and Chizvirizvi presented earlier. The high poverty levels expressed by most of the questionnaire respondents in Mahenye and Chizvirizvi were also confirmed in group discussions held in these areas. One female group discussant in Mahenye said that "*Most of us here in Mahenye are very poor as you can see for yourself. We can go for months without any cash in our homes*". The high poverty profiles among the residents of Mahenye and Chizvirizvi were also confirmed by the traditional leaders of both areas who indicated that most of their subjects were poor subsistence farmers.

Table 6.17: Household poverty levels (in %)

Household poverty levels	**Mahenye (n=150)**	**Chizvirizvi (n=150)**	**Total (n=300)**
Low	0.7	-	0.3
Moderate	22.0	28.7	25.3
High	30.7	58.7	44.7
Very high	46.7	12.7	29.7
Total	100	100	100

Both the First and Second PAS conducted in 1995 and 2003 showed that there were more households in poverty in the rural areas than in urban areas in Zimbabwe. The Second PAS indicated that both the prevalence and depth of poverty had increased considerably between 1995 and 2003 in both the rural and urban areas of the country, with poverty still more prevalent among rural households (Ministry of Public Service, Labour and Social Welfare, 2006). With 77.4% of the respondents in Mahenye and 71.4% of the respondents in Chizvirizvi rating their poverty levels between high and very high, the results of this study seem to confirm what the national surveys reported. In addition, 22% and 28.7% of the

respondents in Mahenye and Chizvirizvi, respectively, rated their poverty levels to be moderate. The high poverty levels in Mahenye and Chizvirizvi confirm literature evidence indicating an overlap between poverty and protected areas (Fisher and Christopher, 2007; Gurney et al, 2014; Meilby et al, 2014; Pinho et al, 2014; Redford et al, 2008; Turner et al, 2012). In Zimbabwe, the co-location of poverty and protected areas came as a result of colonial policies which evicted and resettled indigenous populations in agro-ecologically marginal areas only suitable for wildlife.

Poverty presents a particular challenge for environmental management as the poor, in search of means to sustain themselves, often unintentionally engage in activities that damage the environment (Fisher and Christopher, 2007; Holden et al, 2014; Roe and Elliot, 2005; Vira and Kontoleon, 2010). In addition, poverty may lead to the migration of people, particularly men, to urban areas or to other countries in search of employment, leaving women, the elderly and the young to bear the burden of environmental management (Chenje et al, 1998; Gupta et al, 2009; Imai et al, 2014). Some of the environmentally unsustainable activities that the poor often engage in include gold panning, selling of firewood and overharvesting of natural resources including overhunting and overfishing (Babigumira et al, 2014; Holden et al, 2014; Hou et al, 2014; Vira and Kontoleon, 2010). The relationship between poverty and environmental degradation in Zimbabwe was clearly demonstrated by the Second PAS of 2003 which showed that while the very-poor were found to be more aware of environmental regulations than the non-poor, they were, however, implicated in many environmentally damaging activities as they struggled for survival (Feresu, 2010). It has been highlighted earlier that environmental awareness alone is not sufficient for fostering attitude change towards environmentally sustainable practices, hence the need to incentivise such a change in attitude. Poverty alleviation could be one such incentive for a positive attitude towards the environment, especially where proceeds from environmental conservation activities (such as those from ecotourism) are being channelled towards alleviating poverty. One of Zimbabwe's three priority MDGs is the eradication of extreme poverty and hunger, targeting to halve poverty and hunger and reduce the proportion of the malnourished under-fives by two thirds between 2002 and 2015 (Government of Zimbabwe, 2004). However, considering the current adverse economic environment prevailing in the country, meeting these targets is proving to be a huge challenge. With poverty prevailing in Mahenye and Chizvirizvi as shown above, the conservation areas could help through various interventions. Conservation literature notes

that protected areas cannot survive while ignoring the plight of the poor communities they often share boundaries with (Buta et al, 2014).

6.2.2.3 Social services and amenities

With regard to the type of dwelling units (Table 6.18), the majority of households in Mahenye (81.3%) lived in traditional huts made of pole and dagga/ mud. There was a more even distribution of dwelling types among the households in Chizvirizvi, with 31.3% of households living in traditional pole and dagga huts, 30.7% living in dwellings combining formal houses, thatched brick houses and traditional huts, while 22% of households lived in combined formal houses and traditional huts.

Table 6.18: Type of dwelling (in %)

Type of dwelling	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Formal house (brick and roofing sheets	4.0	1.3	2.7
Formal house plus thatched brick house/s	1.3	8.7	5.0
Formal house plus traditional huts	3.3	22.0	12.7
Thatched brick houses	1.3	6.0	3.7
Traditional hut/s (thatched pole and dagga)	81.3	31.3	56.3
Combined formal house, thatched brick house/s and traditional huts	8.7	30.7	19.7
Total	100	100	100

The 2012 National Census reported that 51% of the households in the country lived in traditional dwelling units while 44% occupied dwelling units which were modern (Central Statistical Office, 2012). There were more households with modern dwelling units in Chizvirizvi than in Mahenye. The high number of thatched pole and dagga huts in the study areas, particularly in Mahenye, further highlights the centrality of natural resources to the lives of the people in the study areas.

Information on the type of toilet or sanitation facility used by the household (Table 6.19) indicated that a sizeable overall proportion (48.3%) of the households in the survey population had no toilet facility at all. For Mahenye, 39.3% of households had no toilet while 60.7% had pit latrines. In Chizvirizvi, quite a huge proportion of households (57.3) had no toilet facility while 42.7% had pit latrines.

Table 6.19: Type of sanitation (toilet) (in %)

Type of sanitation	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
None	39.3	57.3	48.3
Pit latrine	60.7	42.7	51.7
Total	100	100	100

The National Census of 2012 reported that 24% of national households had no toilet facility, 33% used flush toilets while the remaining 43% used the pit latrine (Central Statistical Office, 2012). The high bush densities in the study sites, particularly in Mahenye, and the large landholding sizes in Chizvirizvi allow many households to use the bush as a toilet, thereby reducing the sense of urgency in the need for households to construct toilets. However, lack of toilets could also be due to the high poverty levels in the study sites.

With regard to the source of water for domestic use (Table 6.20), all the households in Mahenye had access to water from communal boreholes, while 26% of the respondents in Chizvirizvi had access to the same water source. The remaining 74% of the respondents in Chizvirizvi had access to water from wells at various levels of protection. Many people in Chizvirizvi had dug some wells at their homesteads.

Table 6.20: Main source of domestic water (in %)

Main source of water	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Communal borehole	100	26.0	63.0
Well	-	74.0	37.0
Total	100	100	100

The National Census of 2012 estimated that 75% of households in Zimbabwe had access to safe water (Central Statistical Office, 2012). Mahenye residents had access to safer domestic water compared to the residents of Chizvirizvi. In addition, some of the wells that had been dug by most households in Chizvirizvi are at risk of faecal coliform contamination from pit latrines and bushes used as toilets.

The availability of sanitary facilities and access to safe water are major determinants of household health. The pollution of water due to inadequate sanitation facilities is a major concern as it leads to human illness and death. According to the UNEP (2007), over three million people in developing countries die of water-borne and water-related diseases every

year, the majority of whom are children under the age of five. More particularly, the morbidity and mortality rates from water-borne and water-related diseases such as malaria, cholera and diarrhoea are relatively high due to poor quality of drinking water and inadequate sanitation facilities (African Ministerial Conference on the Environment and UNEP, 2006). An estimated 56% of rural households in Zimbabwe had access to safe sanitation in 1997 while in 1999 this had increased to 58% (Government of Zimbabwe, 2004). Access to safe water was estimated at 73% of rural households, rising to 75% in 1999 (Government of Zimbabwe, 2004). Zimbabwe's MDG target is to ensure that every household has access to a toilet within the homestead and to potable water within 250 metres by 2015 (Feresu, 2010; Government of Zimbabwe, 2004). This target has certainly not yet been achieved in Mahenye and Chizvirizvi, and more particularly so in the latter. The SLA identifies good health as one of the key assets for the successful pursuit of livelihoods (Scoones, 1998). The water supply and sanitation situation in the study sites, particularly in Chizvirizvi, predisposes the residents to ill health, which may eventually lead to the ineffective pursuit of various livelihoods activities by those affected thus resulting in poverty. This may in turn lead to increased reliance on biodiversity and other natural resources. The link between poverty and environmental degradation has already been highlighted.

Results on household energy use (Figure 6.21) indicated a dominance of wood for cooking, heating and even lighting in the two study sites. For lighting, all the respondents in Mahenye indicated that they used wood, 15.3% used paraffin, 3.3% used solar while 7.3% used candles. In Chizvirizvi, 78%, 30.7%, 5.3% and 10.7% of the respondents said they used wood, paraffin, solar and candles, respectively, for lighting. There were slightly more households using paraffin, solar and candles for lighting in Chizvirizvi than in Mahenye. With respect to cooking, all the respondents in the two study sites used wood, while 5.3% in Mahenye and 4.7% in Chizvirizvi were using shelled maize cobs. All the respondents in Mahenye cited wood as the sole energy source for heating. While all the respondents in Chizvirizvi also used wood for heating, another 2.7% indicated that they used shelled maize cobs for heating. None of the households in the study sites used electricity (either from the public supply or from generators), gas or coal as energy sources.

Table 6.21: Sources of energy used for lighting, cooking and heating (in %): multiple responses

Energy sources	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Sources of energy used for lighting			
Paraffin	15.3	30.7	23.0
Solar	3.3	5.3	4.3
Fuel wood	100.0	78.0	89.0
Candles	7.3	10.7	9.0
Sources of energy used for cooking			
Fuel wood	100	100	100
Shelled maize cobs	5.3	4.7	4.0
Sources of energy used for heating			
Fuel wood	100	100	100
Shelled maize cobs	-	2.7	1.3

Wood is the most commonly used energy source for over 90% of households in the rural areas in Zimbabwe (Central Statistical Office, 2012; Chenje et al, 1998). This reflects the energy-use situation at the global level where forest biomass is an important source of energy for rural livelihoods particularly in developing countries and "ranks fourth as an energy source worldwide, and provides about 14% of the world's energy needs" (Ranjitkar et al, 2014: 246). However, with the downturn in the country's economy since 2000, more households in cities now rely on wood for cooking and heating due to persistent power cuts, resulting in a substantial increase in the movement of wood into urban areas from surrounding and distant rural areas (Feresu, 2010). The selling of wood in urban areas or along major roads by poor people from the rural areas has become a major livelihood activity. The high and increasing use of biomass fuel, particularly wood, has raised serious concerns about deforestation and environmental degradation in the country (Government of Zimbabwe, 1998; Ministry of Environment and Natural Resources Management, 2009; Ministry of Environment and Natural Resources Management, 2010). Studies by Mohammed et al (2014) in sub-Saharan Africa and also by Ranjitkar et al (2014) in south Asia have linked biomass energy consumption to environmental strain in these regions. In addition, the use of biomass as the main source of energy by households in Zimbabwe exposes many people to indoor air pollution as most of these households use an open fire or stove without a chimney (Ministry of Health and Child Welfare, 2004; Mishra, 2003; Rumchev et al, 2007). The WHO (2002) notes that indoor smoke from solid fuels is estimated to be the fourth leading cause of death behind malnutrition, unsafe sex and lack of water and sanitation in

developing countries. The health impacts of indoor air pollution have been found to be closely linked with gender and poverty, with women (and babies often carried on their backs) disproportionately bearing the burden of the impacts of pollution due to their greater exposure to smoke while cooking (Air Pollution Information Network for Africa, 2008; UNEP, 2006; 2007). Considering the high percentage of the population using biofuels, the issue of indoor air pollution is certainly a priority issue for policy-makers.

The over-reliance on biomass energy in the study areas certainly has important implications on biodiversity conservation and livelihoods. Such an over-reliance on biomass for energy needs represents an environmental strain on the natural resource base in the study sites and, depending on demand and availability, this strain may eventually affect the protected areas through over-harvesting of firewood. The reliance on biomass energy may also mean that residents are spending some of their time collecting fuelwood. This translates into opportunity costs in terms of foregone time for other more productive livelihoods activities such as farming.

Information on the average times taken to access various community services in the study sites (Table 6.22) indicated that residents in Chizvirizvi took more time to access the various services considered in the study compared to residents in Mahenye with the exception of the water service. The longest average time taken to access a service (primary school) in Mahenye was 49.6 minutes, with no community service taking an hour or more to be accessed. In Chizvirizvi, the average time needed to get to the clinic, high school and police station slightly exceeded one hour. The average time to access water was shorter in Chizvirizvi (21.8 minutes) than in Mahenye (37.2 minutes) because, as indicated earlier, many residents in the former had dug some wells at their homesteads.

Table 6.22: Average times taken to various community services in study sites (minutes): multiple responses

Average time taken to:	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Water source	37.2	21.8	29.5
Clinic	43.7	60.2	51.9
Primary school	49.6	52.1	50.9
High school	43.4	60.6	52.0
Main road	37.1	40.7	38.9
Shops	40.5	48.6	44.6
Police station	41.8	62.8	52.3

The provision of various essential community services by government in resettlement areas has always been one of the major challenges of the land reform programme in Zimbabwe due to both poor planning and lack of resources (Clover and Eriksen, 2009; Makadho, 2006; Moyo, 2006). The Zimbabwe government has noted that progress towards achieving its MDG target of universal primary education for boys and girls by 2015 has been undermined by population movements into newly resettled areas lacking adequate schools (Government of Zimbabwe, 2004). This partly explains why average times taken to access various services, including schools, were longer in Chizvirizvi than in Mahenye. The long average times being taken by residents in the study areas for accessing various community services, particularly in Chizvirizvi, have also resulted in some huge opportunity costs on time just as with fuelwood collection noted earlier. This reduces the amount of time being spent on activities more important for sustaining livelihoods.

The level of development of any population is determined by the quality of services available. Respondents were asked to rate the quality of selected services in their communities and the results are presented in Table 6.23.

Table 6.23: Respondents' rating of the quality of selected community services (in %)

Service quality rating	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Water supply			
Satisfied	48.7	45.3	47.0
Neutral	0.7	-	0.3
Dissatisfied	50.7	54.7	52.7
Total	100	100	100
Clinic			
Satisfied	49.3	87.3	68.3
Neutral	0.7	-	0.3
Dissatisfied	50.0	12.7	31.3
Total	100	100	100
Primary school			
Satisfied	18.0	40.0	29.0
Neutral	2.0	-	1.0
Dissatisfied	80.0	60.0	70.0
Total	100	100	100
High school			
Satisfied	16.0	44.0	30.0
Neutral	2.0	-	1.0
Dissatisfied	82.0	56.0	69.0
Total	100	100	100
Main road			
Satisfied	39.3	25.3	32.3
Neutral	2.0	-	1.0
Dissatisfied	58.7	74.7	66.7
Total	100	100	100
Public transport			
Satisfied	19.3	20.0	19.7
Dissatisfied	80.7	80.0	80.3
Total	100	100	100
Shops			
Satisfied	40.0	60.7	50.3
Neutral	4.7	-	2.3
Dissatisfied	55.3	39.3	47.3
Total	100	100	100
Police			
Satisfied	52.7	88.0	70.3
Neutral	8.7	-	4.3
Dissatisfied	38.7	12.0	25.3
Total	100	100	100

In Mahenye, 48.7% of the respondents said they were satisfied with the water supply service in their area while 50.7% said they were not satisfied. For Chizvirizvi, 45.3% of the respondents said they were satisfied with the water supply service in their area while 54.7% said they were not satisfied. With regards to clinic service quality, 49.3% of the respondents in Mahenye expressed satisfaction with the service at Mahenye Clinic while 50% were dissatisfied. In Chizvirizvi, 87.3% of the respondents said they were satisfied with the service at Chizvirizvi Clinic while 12.7% expressed dissatisfaction. Concerning education, 80% and 82% of the respondents in Mahenye were dissatisfied with the service quality at the primary and secondary schools respectively, while in Chizvirizvi 60% and 56% of the respondents were not satisfied with the service at the primary and secondary schools respectively. Information on road quality and public transport service quality in Mahenye indicated that 58.7% and 80.7% of the respondents were dissatisfied respectively, while for the same services 74.7% and 80% of the respondents in Chizvirizvi expressed dissatisfaction. Commenting on the poor quality of the public transport service in their area, one group discussant in Mahenye noted that "*If one misses the early morning bus, he/ she will have to try again the next morning. Sometimes if you get up early enough to catch the bus, you might fail to get a seat as the minibus can only carry a maximum of 30 passengers*". When asked to rate the quality of service for shops in their area, 55.3% of the respondents in Mahenye and 39.3% of the respondents in Chizvirizvi indicated that they were not satisfied. Participants at group discussions held in both areas complained that the local shops were far much more expensive compared to those in nearby towns. Eighty eight percent of the respondents in Chizvirizvi were satisfied with the service from the police, while 52.7% of the respondents in Mahenye said they were satisfied with the police service in their area. Services for which the majority of the respondents in both study sites expressed dissatisfaction included water supply, primary school, high school, main road and public transport. The majority of the respondents in Mahenye expressed dissatisfaction with the quality of each of all the services in their area except for police service, while in Chizvirizvi the majority of the respondents expressed dissatisfaction with the quality of each of all the services in their area with the exception of clinic, shopping and police services. The results seem to suggest that the quality of most of the selected community services in the two study sites was poor.

The respondents in the two study sites were further asked to rate the development or improvement priority for the services in their communities (Table 6.24). The results indicated that the majority of the respondents in both Mahenye and Chizvirizvi perceived the

development priority for most services in their areas to be important. The responses in Table 6.24 echo those presented earlier in Table 6.23 where the majority of the respondents in the study sites expressed dissatisfaction with most community services. The lowest development priorities were expressed for clinic and police services in Chizvirizvi where 87.3% and 88% of the respondents indicated that the development priorities for these services were unimportant, respectively.

The poor quality of services in both Mahenye and Chizvirizvi is a reflection of colonial policies that deliberately under-funded rural development (Cavendish, 2000; Feresu, 2010), as much as it also reflects the general failure of rural development initiatives in the post-independence era (Bond, 1999; Hurungo, 2007; UNDP, 2010). As a result, most rural areas in the country continue to lag behind urban areas in terms of access to various services by residents.

The poor quality of services in the study sites helps in reinforcing the high poverty profiles already noted in these areas. For instance, the livelihood impacts of services such as water supply and sanitation and health have already been discussed. With only 18% and 16% of the respondents in Mahenye satisfied with primary and high school services, respectively, while 40% and 44% are satisfied with the same services in Chizvirizvi, respectively; the quality of educational services in the study areas is certainly cause for concern. This is because, as shown earlier, education is crucial in influencing environmental behaviours and attitudes, with better-educated people likely to be more supportive of conservation initiatives. In addition, education has the potential to turn around the livelihood misfortunes of poor people by opening up greater livelihood opportunities for them, which may liberate them from a precarious dependence on natural resources. Moreover, education will enable local people to secure higher-paying jobs in the conservation areas, thereby providing a powerful incentive for biodiversity conservation to the local people.

Table 6.24: Respondents' rating of the development/improvement priority for selected community services (in %)

Devpnt. priority rating	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Water supply			
Important	51.3	54.0	52.7
Neutral	0.7	-	0.3
Unimportant	48.0	46.0	47.0
Total	100	100	100
Clinic			
Important	48.0	12.7	30.3
Neutral	0.7	-	0.3
Unimportant	51.3	87.3	69.3
Total	100	100	100
Primary school			
Important	80.0	60.0	70.0
Neutral	2.0	-	1.0
Unimportant	18.0	40.0	29.0
Total	100	100	100
High school			
Important	82.0	56.0	69.0
Neutral	2.0	-	1.0
Unimportant	16.0	44.0	30.0
Total	100	100	100
Main road			
Important	58.7	74.7	66.7
Neutral	2.0	-	1.0
Unimportant	39.3	25.3	32.3
Total	100	100	100
Public transport			
Important	80.0	80.0	80.0
Unimportant	20.0	20.0	20.0
Total	100	100	100
Shops			
Important	54.0	38.7	46.3
Neutral	5.3	-	2.7
Unimportant	40.7	61.3	51.0
Total	100	100	100
Police			
Important	38.0	12.0	25.0
Neutral	8.7	-	4.3
Unimportant	53.3	88.0	70.7
Total	100	100	100

6.2.2.4 Reliance on natural resources

When asked to rate their reliance on natural resources for livelihoods (Table 6.25), 48% of the respondents in Mahenye said they had a very strong reliance on natural resources, 36.7% rated their reliance as strong while 15.3% said they moderately relied on natural resources for livelihood. In Chizvirizvi, 36.7%, 60.7% and 2.7% of the respondents rated their reliance on natural resources as very strong, strong and moderate respectively.

Table 6.25: Respondents' reliance on natural resources for livelihood (in %)

Respondents' reliance on natural resources	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Very strong	48.0	36.7	42.3
Strong	36.7	60.7	48.7
Moderate	15.3	2.7	9.0
Total	100	100	100

The results on respondents' reliance on natural resources indicated that the majority of households in the study sites heavily relied on natural resources for livelihood. The majority of the respondents in Mahenye (84.7%) rated their reliance on natural resources between very strong and strong, while in Chizvirizvi 97.4% of the respondents rated their reliance on natural resources between very strong and strong. This shows that natural resources play a significant role in the livelihoods of the households in the study areas. These results are in tandem with previous researchers (Cavendish, 2000; FAO, 2001) who indicated that the forests of Zimbabwe provide various timber and non-timber products such as food, medicines, energy, building and craft materials to people in the rural areas where the majority of them depend on these and other natural products for their livelihoods and income generation. The FAO (2001) estimates that NTFPs contributed to over 35% of rural incomes in some parts of the country. Studies in other parts of the world (Hogarth et al, 2013; Mohammed et al, 2014; Ranjitkar et al, 2014; Zenteno et al, 2013) have also documented the significance of forest products to livelihoods and well-being among rural households. Hogarth et al (2013: 111) further note that "systemic institutional failure to collect forest-related income data across the developing world has led to a significant underestimation of the forest sector's importance to rural livelihoods and economic development". In addition, biodiversity provides important ecosystem services such as maintenance of soil fertility, regulation of climate and as a natural control for outbreaks of pests and diseases (Ehrlich and

Ehrlich, 1981; Hill et al, 2014; Hou et al, 2014; MEA, 2005a; Pinto et al, 2014). Such services are crucial to poor rural farmers lacking resources with which to procure fertilisers, pesticides and other modern agricultural chemicals.

Respondents were further asked to identify the various natural resources they frequently collected from the natural environment around them (Table 6.26). The information presented in Table 6.26 is in agreement with evidence presented earlier (Table 6.25) indicating a strong reliance on natural resources by the majority of the respondents in the study sites.

Table 6.26: Resources frequently collected by respondents from the natural environment (in %): multiple responses

Resources frequently collected from environment	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Meat	86.0	3.3	44.7
Fish	90.7	17.3	54.0
Edible insects	93.3	100	96.7
Fruits	90.7	96.7	93.7
Vegetables	94.7	99.3	97.0
Mushrooms	98.7	100	99.3
Medicines	88.7	99.3	94.0
Dyes (from plants)	16.7	2.0	9.3
Timber	98.0	100	99.0
Thatching grass	98.0	98.0	98.0
Firewood	100	100	100
Flowers	21.3	-	10.7

However, in spite of the above-highlighted centrality of biodiversity to human survival in the rural areas of Zimbabwe, the biodiversity of the country continues to decline due to various drivers (Baudron et al, 2011; Chenje et al, 1998; Ministry of Environment and Natural Resources Management, 2010). It is important to note that over-reliance on natural resources by rural households has been cited as one of the major drivers of biodiversity decline in the rural areas of Zimbabwe (Ministry of Environment and Natural Resources Management, 2010), hence the need to find alternative livelihood sources for the majority of rural residents disproportionately dependent on biodiversity for survival.

6.3 Community livelihood benefits from conservation

The preceding section has discussed the demographic and socio-economic characteristics of the questionnaire respondents in Mahenye and Chizvirizvi. This section examines the

livelihood benefits from the conservation areas to the local communities. Various livelihood benefits from the conservation areas to communities were identified. These are presented below.

6.3.1 Community and household income enhancement

One of the identified livelihood benefits to Mahenye and Chizvirizvi from the conservation areas was income enhancement. The enhancement of income in Mahenye and Chizvirizvi has occurred at two levels, the community and household levels.

As indicated earlier in Chapter Four, the legal mechanisms through which CAMPFIRE operates in Zimbabwe was the granting of appropriate authority to District Councils through the amendment of the Parks and Wildlife Act (1975) in 1982. While the principal service sellers in CAMPFIRE are the wildlife producing communities on whose land is wildlife, RDCs have been granted authority by government to receive and manage wildlife revenues on behalf of the wildlife producing communities as intermediaries (Frost and Bond, 2008). This service is then bought by safari operators from the communities, through contracts with the RDCs, who then package it into hunting or ecotourism safaris and sell to safari hunters and eco-tourists as end users or clients (Frost and Bond, 2008). In other words, safari operators buy the rights to bring sport hunters and eco-tourists to their concession areas in the wildlife producing communities to hunt a set quota of animals or track, observe and photograph wildlife (Frost and Bond, 2008). CAMPFIRE allows revenues derived from wildlife through safari operators to be accrued by District Councils rather than central treasury, which in turn increases incentives for councils to invest in wildlife-based revenue-earning activities. The gross wildlife revenue received by District Councils is in turn allocated to wildlife producing communities, wildlife management activities and district council levies (Bond, 2001). The CAMPFIRE financial model has been presented earlier (Figure 3.3).

The Mahenye CAMPFIRE project started in 1990 when Chipinge Rural District Council was granted appropriate authority to manage wildlife in the district. The Mahenye community immediately set up a committee, the Mahenye CAMPFIRE Committee (MCC), responsible for carrying out management functions, employing local staff to monitor wildlife and its use, including poaching and the hunting activities of the hunter (Rihoy et al, 2010). The MCC board members are democratically and transparently elected once every two years at an open general meeting.

Community income enhancement from the CAMPFIRE project in Mahenye has occurred through various activities. The Mahenye community set aside a 15 000 hectare wildlife conservation area in which sport hunting and ecotourism activities take place. The sole source of community income during the early years of CAMPFIRE in Mahenye was sport hunting (Table 6.27).

Table 6.27: Income for Mahenye Ward by source, 1990-2000

Year	Sport Hunting (Z$)	Tourism (Z$)	Other (Z$)	Total (Z$)
1990	28 000	0		28 000
1991	70 800	0		70 800
1992	179 910	0		179 910
1993	158 000	0		158 000
1994	163 736	0		163 736
1995	138 445	0	4 000	142 445
1996	200 000	0	78 979	278 979
1997	158 797	429 805		588 602
1998	389 170	545 312		934 482
1999	534 021	753 232		1 287 253
2000	1 085 544	396 980		1 482 524
Totals Z$	**3 106 423**	**2 125 329**	**82 979**	**5 314 731**
Totals US$	**56 480**	**38 642**	**1 509**	**96 631**
% Income Totals	**58%**	**40%**	**2%**	**100%**

Source: Chipinge Rural District Council (cited in ART, 2002: 5)

Table 6.27 shows that almost all CAMPFIRE revenue in Mahenye between 1990 and 1996 came from the sport hunting concession in the Mahenye/Mutandahwe area. Between 1990 and 2000, Mahenye Ward received a total of US$56 480 from sport hunting. The revenue generating potential of the Mahenye hunting concession is primarily dependent on trophy elephant, including a few other 'huntable' species such as leopard, buffalo, bushbuck, grysbok and impala (Murphree, 2001). The hunting quota in Mahenye is set by the Parks and Wildlife Management Authority (PWLMA). While the elephant quota in Mahenye between 1992 and 1996 was four per annum, this quota was not achieved or filled except in 1992, with only about one or two elephants being taken each year throughout much of the 1990s (Mashinya, 2007; Murphree, 2001). Severe droughts in the 1990s, particularly in the 1991/1992 rainy season, greatly reduced the numbers of elephants in the neighbouring Gonarezhou National Park and in Mahenye Ward. This had a negative impact on concession

revenues in Mahenye through low elephant quotas which, as already shown, were rarely filled. The elephant hunting quota for Mahenye in 2013 was 6.

According to Muir-Leresche et al (2003 cited in Mashinya, 2007: 95), the price paid by hunters for an elephant in Zimbabwe between 1990 and 2000 was about US$9 000. In 2013, hunters paid between US$10 000 and US$12 000 per elephant depending on trophy size. Fifty five percent of the revenue from sport hunting goes to Mahenye. Chipinge Rural District Council gets 41% of hunting revenue while the CA gets the remaining 4%.

In spite of subsequent increases in elephant populations and trophy prices, it became clear that the capacity of Mahenye Ward to expand its sport hunting revenues was finite, with little scope for significant growth (Murphree, 2001). The leaders of the Mahenye CAMPFIRE project were early in seeing the need to diversify the ward's wildlife-related income in addition to sport hunting. This ultimately led to the growth and development of ecotourism as another community income enhancing activity in the ward. In 1994, the Chipinge Rural District Council, on behalf of the people of Mahenye, signed a 10-year lease agreement with a private tourism operator, Zimbabwe Sun Hotels, for the construction of two upscale tourist lodges, Mahenye Safari Lodge and Chilo Lodge, catering to a high-paying tourist market for game viewing and photographic safaris (Murphree, 2001; Rihoy et al, 2010). The two lodges accommodate a combined total of 44 guests. In return for the right to build in Mahenye, Zimbabwe Sun Hotel agreed to pay Chipinge Rural District Council 8% of its gross trading revenue in the first three years, 10% in the next three years and 12% in the remaining three years (Murphree, 2001). Chipinge Rural District Council would then channel 75% of the revenue to Mahenye Ward. Between 1997 and 2000, ecotourism generated a total of US$ 38 642 for Mahenye (Table 6.27). By 1997 the two lodges were generating twice the income from sport hunting and were responsible for more than tripling the overall CAMPFIRE income for Mahenye between 1997 and 2000. In addition, the ecotourism venture provided an opportunity for infrastructural development in Mahenye by Zimbabwe Sun Hotels. This included the erection of a 45 km electricity supply line from the national grid at Quinton Bridge, upgrading of the gravel road from Quinton Bridge to Mahenye, installation of a water purification, pumping and reticulation system and the erection of a telephone line (Murphree, 2001). An airstrip was also built near the lodges for the emergency evacuation of critical medical cases. The construction of the lodges and the ancillary infrastructure resulted in a capital investment of Z$24.9 million in Mahenye (Murphree, 2001). While this infrastructural

development was primarily meant for tourists, the Mahenye community also benefited immensely from these developments. For example, the Mahenye community had for years asked Chipinge Rural District Council to improve the gravel road without success.

At the end of the 10-year contract in 2004, Zimbabwe Sun Hotel did not seek renewal of the lease agreement with Chipinge Rural District Council. The hotel firm cited the marked decline in tourist arrivals in the country since the start of the political crisis in 2000 as the reason for not renewing its lease agreement (Mashinya, 2007). The lease has since been taken over by River Lodges of Africa (Murphree, 2001). Under the new 10-year lease agreement, the new management has been paying 10% of profits directly to the Mahenye community. Chilo Lodge has, however, been undergoing some renovations between 2010 and 2012 for increasing the number of visitors it can accommodate and the Mahenye community has not been getting anything during this time. Again, Mahenye Ward did not receive any money from the lodge in 2013 as, according to the management, it did not make any profits. The lodge needs a 45% occupancy in order to make profit, while occupancy in 2013 was 35%. The Mahenye Safari Lodge, which is located on Gayiseni Island in the middle of the Save River, has not been operating since 2008 as it was extensively damaged by flooding after a cyclone hit the area.

The Mahenye community has invested in various other income generating projects with the revenue received from sport hunting and ecotourism. These projects include a grinding mill, a shop and a truck which is hired out to various clients. The CAMPFIRE clerk revealed that the income received from the grinding mill ranges from US$900-US$1 200 per month. The Mahenye community also owns a grocery shop which was constructed using CAMPFIRE revenue. Sometimes the shop is rented out to individuals at a rate of about US$100 per month, while at times the shop is operated by the Mahenye CAMPFIRE Committee. Another building is rented out to a welder who pays about US$50 per month. The Mahenye community also purchased a Mazda T35 truck with CAMPFIRE income. The truck is used to transport people to Chiredzi Town which is approximately 120 km from Mahenye, with each passenger paying about US$7 for a return trip. This service is quite important for Mahenye residents since, as shown earlier, there is a serious shortage of public transport in the area. The truck is also hired by various people in the community for the transportation of their goods.

Unlike in Mahenye where CAMPFIRE has directly contributed to the generation of income at community level, the MPWR has not directly contributed to income generation in Chizvirizvi at the community level. Income enhancement at the household-level has, however, occurred in both Mahenye and Chizvirizvi.

One of the ways in which CAMPFIRE has contributed to the enhancement of household income in Mahenye has been through household cash dividends derived from CAMPFIRE revenue (Table 6.28). On average, the revenue allocated to household dividends between 1990 and 2000 was consistently around 50% of total CAMPFIRE revenue. According to Muir-Leresche et al (2003 cited in Mashinya, 2007: 96), dividends per household averaged between US$10 and US$30 per annum, which was about 5-10% of average family income (Balint and Mashinya, 2006). There has only been one allocation for household dividends since 2001 which took place in 2004. The household dividend was supposed to be about Z$6 100 but Z$6 000 was deducted by the traditional leadership as a 'district development levy' whose validity was highly questionable, resulting in an actual household dividend of Z$100 (Rihoy et al, 2010). While significant, household cash dividends were certainly not adequate enough to act as an alternative income source to subsistence crop and livestock production but could only suffice as an additional source of household income. When compared to agricultural production, the household cash benefits from wildlife were merely supplementary to crop and livestock production (Bond, 1999).

Table 6.28: Percentage allocation of revenue in Mahenye Ward, 1990 – 2000

Year	Household Dividends	Wildlife Management	Council Levy	Projects	Total
1990	100	0	0	0	100
1991	79	0	21	0	100
1992	48	6	17	29	100
1993	51	18	17	14	100
1994	50	17	22	11	100
1995	55	20	20	5	100
1996	50	13	18	19	100
1997	58	10	22	10	100
1998	57	9	20	14	100
1999	46	20	21	13	100
2000	53	20	21	6	100
% Total	**53**	**15**	**20**	**12**	**100**

Source: Chipinge Rural District Council (cited in ART, 2002: 6)

The conservation areas have created employment opportunities in both Mahenye and Chizvirizvi thereby enhancing household incomes. When asked whether they or any of their household members worked at the conservation area, 16.7% of questionnaire respondents in Mahenye said yes while 10% in Chizvirizvi also said yes (Table 6.29).

Table 6.29: Whether respondents or any member/s of their households worked at the conservation area (in %)

Conservation employment	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Yes	16.7	10.0	13.3
No	83.3	90.0	86.7
Total	100	100	100

Some households had more than one member of the household having a conservation-related job. In Mahenye, 16% of those households with a member or members working at the conservation area had two household members with a conservation-related job, while in Chizvirizvi 13.3% of these households also had two members employed in conservation. The income levels of households with more than one member working in conservation were certainly boosted.

Chilo Lodge, the Mahenye Campfire project and the current hunter, Zambezi Hunters, were identified as the main sources of conservation-related employment for the residents of Mahenye Ward. Chilo Lodge was the largest employer in Mahenye and employed a total of 35 employees. These included 5 security guards, 5 in housekeeping work, 4 gardeners, 5 in maintenance work, 2 bar attendants, 3 waiters, 3 cooks, 3 guides, 2 porters, 1 caretaker, 1 operations manager and 1 camp manager. All of the workers, with the exception of the 2 managers, were from within Mahenye Ward. This is because CAMPFIRE insists that first preference has to be given to locals whenever an employment opportunity arises. Outsiders are only considered when no locals are able to fill the post. It is important to note that 7 out of the 35 employees at Chilo Lodge were former poachers. In this case, employment creation by the conservation area has acted as an effective incentive for biodiversity conservation.

The Mahenye CAMPFIRE project also employs a total of 12 permanent staff who are mainly employed to run various income-generating activities such as the grinding mill, the truck and the shop. Other locals employed by the Mahenye Campfire project include resource monitors, a clerk and night watchers and caretakers. The role of the resource monitors is to protect

natural resources in Mahenye. They teach people to coexist with natural resources as these are the basis upon which CAMPFIRE exists.

The other source of conservation-related employment in Mahenye was the current hunter, Zambezi Hunters. The hunter employs locals as general cleaners, animal trackers and skinners. At the time of fieldwork, the hunter employed a total of 5 locals. The total number of local people that were employed in Mahenye by Chilo Lodge, Mahenye CAMPFIRE project and Zambezi Hunters at the time of fieldwork in 2013 was approximately about 52 people. Considering that Mahenye Ward has an estimated total population of about 5 000 people, this number, 1% of the total population, is so small. There is certainly a need to create more conservation-related employment opportunities in Mahenye. However, it is important to note that these jobs, though few, would not have come had there been no CAMPFIRE in Mahenye.

The MPWR has also created employment opportunities for the people in Chizvirizvi. An interview with the Human Resources Manager revealed that Malilangwe employed a total of 320 employees. Malilangwe policy on employment is that 65% of employees come from Chiredzi District of Masvingo Province, 25% come from the other districts of Masvingo Province while the remaining 10% comes from anywhere in the country. Unlike the situation in Mahenye where locals are given preferential treatment in employment, Malilangwe does not only look at communities surrounding it such as Chizvirizvi when hiring employees but also considers those from other areas as, according to the Human Resources Manager, this would go against the labour laws of the country which stipulate that anyone can work anywhere in Zimbabwe. The Human Resources Manager further stated that, while local people may have the advantage of hearing about a job vacancy earlier than those from afar, lack of requisite qualifications sometimes hinders them from getting the job. For this reason, most local people fit into low-paying jobs requiring little or no skills such as housekeeping, gardening and game scouting. Only about 7 out of 35 middle-level supervisory jobs (20%) were being held by locals, that is, people from within Chiredzi District (including Chizvirizvi), with the rest coming from other parts of the country. Conservation literature notes that local people bordering protected areas carry a disproportionately huge burden of the negative social, cultural and economic impacts from conservation areas and, therefore, should benefit more from conservation-development initiatives than those communities further from the conservation areas (Bennett and Dearden, 2014; Brockington and Igoe, 2006; Clements et al, 2014). In light of the above, Malilangwe could adopt a deliberate policy

prioritising those communities immediately adjacent to it, including Chizvirizvi, in terms of access to livelihood benefits from the conservation area, including employment opportunities.

Questionnaire respondents in Mahenye and Chizvirizvi were asked to indicate the salaries that they or members of their households in conservation-related employment were getting (Table 6.30).

Table 6.30: Monthly household income contribution from conservation employment (US$) (in %)

Monthly household income contribution from conservation employment	Mahenye (n=25)	Chizvirizvi (n=15)	Total (n=40)
50-100	24.0	6.7	17.5
151-200	32.0	-	20.0
201-250	28.0	53.3	37.5
251-300	-	26.7	10.0
301-350	12.0	-	7.5
351-400	4.0	-	2.5
>400	-	13.3	5.0
Total	100	100	100
	x = 191 r = 300	x = 258.3 r = 375	x = 216.3 r = 375

Table 6.30 shows that the average monthly income for employees in conservation-related employment in Mahenye was US$191 with a salary range of US$300. For Chizvirizvi, the average salary for conservation-related employees was US$258 with a salary range of US$375. There were more people earning higher salaries in Chizvirizvi than in Mahenye, with none earning over US$400 in the latter. Eight workers were reported to have left Chilo Lodge for Malilangwe in search of better salaries.

While the number of jobs offered by a protected area may be few, and the salaries offered modest, such jobs have some empirical evidence of having reduced poverty (Bayliss et al, 2014; Leisher et al, 2010; Liu et al, 2014), and may have significant multiplier effects in the rural economy as a whole (Leisher et al, 2010). Of concern with conservation jobs in the literature, however, has been the realisation that those hired tend to be the moderately poor to better off, while the poorest of the poor rarely have the basic skills or the connections needed to secure a job in a protected area (Borgerhoff Mulder and Coppolillo, 2005; Leisher et al, 2010). In addition, locals are usually employed in positions requiring little or no skill, and

these jobs often pay too little to lift a poor local person out of poverty, with better-paying jobs requiring higher skills often taken by outsiders (Borgerhoff Mulder and Coppolillo, 2005; Leisher et al, 2010). The results of this study therefore seem to agree with the literature, as most of the jobs being generated by the conservation areas for the residents of Mahenye and Chizvirizvi appear to be those requiring low skills. As shown earlier, most people in Mahenye and Chizvirizvi with conservation-related employment were employed as cooks, waiters, housekeepers, launderers, gardeners, resource monitors, game guards, shopkeepers and grinding mill operators among other low-skilled occupations. However, in areas with limited employment opportunities such as Mahenye and Chizvirizvi, these low-skilled and low-pay jobs can make a huge difference in the people's livelihoods. Since most of these workers only have working knowledge gained through in-house training, the conservation areas could help by sending for proper training those workers from the local communities qualifying to enrol at colleges and other training institutions in the country. This may help local people secure the higher-paying conservation jobs often taken by better-qualified outsiders.

The other way in which conservation areas have enhanced household incomes in Mahenye and Chizvirizvi has been through the stimulation of some business opportunities for the people. Seventy one percent and 52% of questionnaire respondents in Mahenye and Chizvirizvi, respectively, indicated that conservation areas had stimulated some business opportunities in their areas. Interviews with key informants and also group discussions in both Mahenye and Chizvirizvi confirmed that conservation had stimulated some business opportunities for the local people. In both areas, selling of crafts to tourists was identified as the main business opportunity that had been stimulated by conservation. In Chizvirizvi, Malilangwe helped with the construction of Kambako Cultural Centre where tourists come to buy various wooden carvings and traditionally woven artifacts as souvenirs. Similarly, there is also the Mahenye Traditional Home Centre where tourists come to buy various craft products. In addition to promoting the selling of crafts to tourists, both Malilangwe and Chilo Lodge also hire some traditional dance groups from Chizvirizvi and Mahenye respectively to come and perform for tourists. This, in a small way, also adds to the household incomes of the dancers. However, several socio-cultural negative impacts of tourism have also been documented, including the erosion or dilution of local traditional cultural values and norms in host communities (Borgerhoff Mulder and Coppolillo, 2005; Jalani, 2012; Youdelis, 2013).

Some key informants in Mahenye also indicated that local people access foreign currency from tourists which they then trade on the black market for profit. However, this business opportunity, which thrived on hyperinflation, ceased to be lucrative since 2009 when government dumped the Zimbabwe dollar and adopted a multi-currency system.

Malilangwe has also indirectly contributed towards the enhancement of household incomes in Chizvirizvi by committing material and financial resources towards the establishment of the large self-contained plots. As indicated earlier in chapter five, the five-hectare arable plots on which people had been settled by government in the early 1980s were not sufficient for most households to grow enough food. The Malilangwe Trust donated various resources for the surveying, mapping and demarcation of plots. Most key informants interviewed indicated that the self-contained plots had improved their lives significantly. While aridity still remained a major challenge to farming, some people indicated that, in a good season, they can for example harvest between 20 and 30 tonnes of maize leaving them with a lot of surplus for sale. The AREX Officer for Chizvirizvi indicated that, while the soils in the area were relatively fertile, on average, one in every three farming seasons has good rains. Others also indicated that they produce some cash crops such as cotton and sorghum. However, some of the farmers noted that quelea birds from Malilangwe also come and eat their sorghum thereby reducing harvests. The large plots have also enabled some farmers to more effectively engage in livestock production, especially cattle.

In addition, Malilangwe has sponsored the setting up of gardening projects in some parts of Chizvirizvi. The beneficiaries of these projects, mainly women and the elderly, said that they sometimes sell surplus vegetables and get some income. However, the gardening project has collapsed mainly due to lack of borehole maintenance. At the time of fieldwork, only one garden located at the Chief's homestead was operational. Decades of rural development experience have proven that the provision of small-scale development-oriented services such as schools, health, roads, and water services are only useful if followed up with operational expenses such as rehabilitation and the technical training of beneficiaries (Borgerhoff Mulder and Coppolillo, 2005). The collapse of the gardening project in Chizvirizvi is therefore one case of lack of follow up by Malilangwe, which has led to the malfunctioning of boreholes.

The sustainable livelihood framework identifies financial capital as one of a number of capitals or assets that are the platform or building blocks from which livelihoods are generated (Bennett and Dearden, 2014; Carney, 1998; Scoones, 1998). The conservation

areas have certainly enhanced this livelihood asset in Mahenye and Chizvirizvi at both community and household levels. This, as shown earlier, has occurred through employment creation, stimulation of business opportunities, household cash dividends and also through various other income generating projects that have been promoted by the conservation areas.

6.3.2 Education enhancement

One of the assets mentioned in the sustainable livelihoods framework, and from which livelihoods are generated, is human capital. Human capital has been identified as a key issue in processes of rural change as it is important for the successful pursuit of different livelihood strategies, with education and skills identified as some of the elements making up this form of capital (Sanchez-Zamora et al, 2014; Scoones, 1998). The conservation areas have also contributed towards the enhancement of education in Mahenye and Chizvirizvi which, in the long-term, will eventually have a bearing on the livelihoods strategies of the people in these areas. Education can be one of the most effective tools for lifting people out of poverty as it can open up vast opportunities for poverty stricken people.

CAMPFIRE-generated revenue has been used for the construction of two school blocks at Mahenye Primary School, with each block having two classrooms. In addition, a two-classroom block has also been constructed at Mahenye Secondary School, while another CAMPFIRE-funded block was still at slab level at the same school. CAMPFIRE has also constructed a teachers' house and a toilet at Mahenye Secondary School. However, one of the two classroom blocks at Mahenye Primary School that were built with CAMPFIRE funds had developed some cracks and needed some major repairs. An interview with the School Head revealed that the building had actually been condemned and deemed unsafe by the Ministry of Primary and Secondary Education, though the school was still using it. Just as failure by Malilangwe to repair boreholes has led to the collapse of the gardening project in Chizvirizvi, failure by the Mahenye CAMPFIRE project to repair the cracking classroom block at Mahenye Primary School is yet another example of lack of follow up on development activities by the conservation areas.

CAMPFIRE also used to pay fees for some disadvantaged but well-performing pupils at both Mahenye Primary and Secondary Schools but this has since stopped. Lack of funds was cited as the reason for discontinuing the bursaries.

Malilangwe has also channelled some resources towards the enhancement of education in Chizvirizvi. Chizvirizvi has two primary schools, Mwenje and Benzi, and one secondary

school, Dhumisani Secondary School. The conservation area has supported these schools in various ways. At Mwenje and Benzi Primary Schools, Malilangwe has refurbished all the classroom blocks at the schools. The refurbishments involved the replacement of doors and window panes, the renovation of floors and roofs, re-plastering and re-painting at a cost of several thousands of dollars. In addition, the conservation area has also refurbished all the toilets at the schools. The refurbishments have given the schools a completely new and modern look.

Malilangwe also connected Mwenje Primary and Dhumisani Secondary Schools to the national electricity grid. Interviews with the authorities at these schools revealed that the availability of electricity had significantly reduced staff turnover, enabling the schools to retain experienced staff. The conservation area also donated some computers and a printer to Dhumisani Secondary School which has enabled the school to teach computer skills to its pupils. Dhumisani Secondary School also received a television set, a video cassette player and some educational tapes which the school uses as teaching aids. In 1999, Malilangwe facilitated for Dhumisani Secondary School to identify a sister school in the USA which subsequently led to the development of a cultural exchange programme involving the exchange of students and teachers for two weeks every year between the two schools. However, the exchange programme never kicked off as it was overtaken by political developments which started in the country in 2000.

Malilangwe has also sourced and donated stationery and textbooks to the three schools in Chizvirizvi. As a way of instilling hard work and competition among students, Malilangwe regularly donates book and cash prizes for excelling students on prize giving days at Mwenje, Benzi and Dhumisani Schools. Malilangwe also started a bursary scheme in 1996 through which it paid both school and exam fees for less-privileged hardworking students at the three schools. The conservation area has also sponsored some students at various tertiary institutions in the country including the University of Zimbabwe, Midlands State University, Solusi University and Great Zimbabwe University. Between 1997 and 2008 Malilangwe funded the education of a total of 700 primary and secondary school students and 16 university students, with some of these beneficiaries coming from Chizvirizvi. However, the bursary scheme has been suspended due to the current economic downturn in the country.

Every year, Malilangwe hosts grade six pupils from Mwenje and Benzi Primary Schools for a one-week stay and educational tour of the conservation area. Some environmental-awareness

workshops are also organised for the kids during this period. The tours and workshops are quite useful to the kids as Environmental Science is part of their curriculum, which gives them an opportunity for conceptualising and contextualising concepts they learn at school. In addition, the tours and workshops are important as they instil in the kids the importance of conserving natural resources at an early stage in their life.

Malilangwe has also sourced and donated some sporting equipment, uniforms and balls for various sporting activities including soccer, netball and volleyball for the schools in Chizvirizvi. In addition, Malilangwe regularly sponsors sporting tournaments for the schools in Chiredzi District in which the schools in Chizvirizvi also participate, with winning schools getting money and trophies among other prizes.

While Malilangwe and the Mahenye CAMPFIRE project have played some important roles in the enhancement of education in Chizvirizvi and Mahenye respectively, sentiments among various respondents in the study sites were that more still needed to be done. For example, there is only one teachers' house at Mahenye Secondary School while there are only four houses for 24 teachers at Mahenye Primary School, with five or six families sharing a single house. In addition, there is no electricity at both schools which has resulted in high staff turnover at the schools as teachers transfer to better schools. Participants at a group discussion in Chizvirizvi indicated that the area needed one more secondary school and one more primary school. One participant at the group discussion stated that, instead of refurbishing already existing schools, Malilangwe could have used the money to build another school thereby alleviating the shortage of schools in the area. Some students travel for about 15 km to get to Dhumisani Secondary School, the only secondary school in the area. Other students who stay far away from the school have resorted to renting some rooms at Chizvirizvi Shopping Centre, which some respondents said may expose the young students to social ills such as drug abuse and prostitution due to lack of parental monitoring.

The implications of education on biodiversity conservation and livelihoods in the study areas have already been highlighted. While the conservation areas have helped in improving education in these areas, more still needs to be done. As shown earlier, the majority of the questionnaire respondents in both study sites indicated that they were not satisfied by most of the services in their communities including educational services. With only 7.3% and 22.7% of the questionnaire respondents in Mahenye and Chizvirizvi, respectively, indicating that they had completed secondary education, most residents in the study areas are therefore not

proceeding beyond primary-level education. In light of the above, it is also important to note that the conservation areas had suspended some bursary schemes they were funding in the study areas.

6.3.3 Community health

The conservation areas have also committed various resources towards the improvement of health in Mahenye and Chizvirizvi. In 1997, Malilangwe financed the erection of a fence around the old Chizvirizvi Clinic. This was followed in 1999 by the construction of a waiting-mothers' shelter at Chizvirizvi Clinic. The sister-in-charge at Chizvirizvi Clinic indicated that the construction of the waiting-mothers shelter significantly reduced the number of women dying from pregnancy-related complications in the area as such complications could now be diagnosed and attended to early. In addition, the expecting-mothers' shelter also reduced the number of women delivering at home, a practice causing the death of many pregnant women.

In 2001, Malilangwe financed and facilitated the construction of the new Chizvirizvi Clinic which was completed in 2002. In addition, Malilangwe sourced and donated medical equipment to be used at the new clinic. The building which housed the old clinic was converted into a nurses' house. The new clinic was then handed over to government.

In 2003, Malilangwe started the Malilangwe Child Supplementary Feeding Scheme (MCSFS) which gives fortified porridge to children from under 5 years of age up to grade seven. The feeding scheme is ongoing and targets communities around the conservation area. Children from Grade 0 to Grade 7 are given the porridge at their schools while those who are under 5 years are catered for at feeding points scattered across the communities within the scope of the scheme. At its peak in 2005, the scheme catered for about 45 000 children, though the number of benefiting children has since reduced to about 22 000 per annum as the area under the scheme has been reduced. The feeding scheme was particularly important in 2008 when the country was at the peak of an economic crisis. The sister-in-charge at Chizvirizvi Clinic also noted that "*the feeding scheme being funded by Malilangwe had played a significant role towards reducing incidences of underweight and malnourished children in Chizvirizvi, especially among the under-fives*". Noting that Zimbabwe's three priority MDGs is the eradication of extreme poverty and hunger, targeting to halve poverty and hunger and reduce the proportion of the malnourished under-fives by two thirds between 2002 and 2015

(Government of Zimbabwe, 2004), the MCSFS is certainly a positive step towards the attainment of this goal.

In 2007, Malilangwe sponsored and participated at the district World AIDS Day and also at the district World Malaria Day. Malilangwe also provided a 7 tonne truck in 2007 for the distribution of mosquito nets throughout Chiredzi District, including in Chizvirizvi, as part of a campaign against malaria. Malaria is a serious health challenge in Chiredzi District. Through the Tunza Trust, Malilangwe is carrying out an ongoing HIV/ AIDS awareness campaign throughout Chiredzi District. Some of the activities involved in this campaign include condom distribution, dramas, road shows, talk shows, quizzes in schools, promotion of abstinence and encouraging people to get tested and take appropriate decisions early.

In 2009, Malilangwe provided meals for cholera victims admitted at Chizvirizvi Clinic which had been declared a cholera centre during the cholera outbreak which hit the country in 2009. In addition, Malilangwe also donated latex gloves for use by medical personnel at Chizvirizvi Clinic during the cholera outbreak.

In Mahenye, CAMPFIRE has also contributed towards health improvement in the area. Unlike in Chizvirizvi where Malilangwe constructed the whole clinic, CAMPFIRE has only constructed toilets at Mahenye Clinic. In addition, CAMPFIRE extended the electricity supply line from Chilo Lodge to Mahenye Shopping Centre in 1996 at a cost of Z$140 500. The electricity line was finally connected to Mahenye Clinic with the help of CAMPFIRE. CAMPFIRE funds were also used in extending telephone and PVC water lines from Chilo Lodge to Mahenye Clinic. The sister-in-charge at Mahenye Clinic noted that "*the connection of the clinic to electricity, piped water and a telephone line has helped very much in improving service delivery at the clinic*".

However, the sister-in-charge also pointed out that the clinic still faces many challenges, including shortages of drugs and lack of transport to ferry critical cases to referral centres like Chiredzi District Hospital 120 km away in Chiredzi Town or Saint Peters Hospital 200 km away in Chipinge Town. Some of the cases for which the clinic needs the referral centres include serious injuries from wild animal attacks and birth complications. While the clinic conducts HIV tests, it does not offer antiretroviral drugs (ARVs) and people have to go to the major hospitals for the drugs. Delays in the collection of ARVs have resulted in some unnecessary HIV/AIDS-related deaths. The sister-in-charge also indicated that the clinic urgently needed a waiting-mothers shelter. In addition, the clinic is not secured with a fence,

resulting in trespassing by goats. CAMPFIRE could help in solving some of the above challenges the clinic is facing.

The other way in which CAMPFIRE has contributed to community health in Mahenye is through the regular provision of game meat to residents. After a safari hunting exercise, the hunter only takes the hides and trophies leaving the meat for the community to share. The meat could be the only source of protein for many poor households in the area. In addition, the regular supply of game meat to residents has helped in reducing poaching.

Some of the key elements of human capital include the ability to labour, good health and physical capability important for the successful pursuit of different livelihood strategies (Sanchez-Zamora et al, 2014; Scoones, 1998). By contributing towards health improvement in Mahenye and Chizvirizvi, the conservation areas are thus helping these communities in realising one of the key livelihood-sustaining assets cited in the sustainable livelihoods framework.

6.3.4 Environmental sustainability

Results presented earlier indicated that the majority of households in Mahenye and Chizvirizvi heavily relied on natural resources for sustenance. The majority of the respondents (84.7%) in Mahenye rated their reliance on natural resources between very strong and strong, while 97.4% of the respondents in Chizvirizvi also rated their reliance on natural resources between very strong and strong (Table 6.25). The sustainable livelihoods framework has identified natural capital or natural resources as an important asset from which many people, particularly in developing countries, derive their livelihoods (Carney, 1998; Scoones, 1998). Conservation activities in the two study sites have helped in maintaining the ecological integrity of these areas thereby preserving the natural resource base upon which many people depend for survival. The adjacent MPWR has helped in instilling natural resource conservation values among the residents of Chizvirizvi. Malilangwe regularly hosts land-use planning workshops with the farmers in Chizvirizvi. As revealed earlier, Malilangwe also hosts Grade 6 pupils for environmental education tours and workshops which inculcates conservation values in the children early in their life. Malilangwe also helped in eliminating from Chizvirizvi the ‘tragedy of the commons’ dilemma, often cited as the main cause of environmental degradation in the communal areas of Zimbabwe, by funding the setting up of self-contained plots. The large plots allow a farmer to do all his or her activities within their plot, including crop production and livestock

grazing, which acts as a relatively strong incentive for sustainable natural resource use and management.

CAMPFIRE has also promoted the conservation of natural resources among the residents of Mahenye Ward. A resource monitoring system has been put in place involving resource monitors who ensure that there is no abuse of natural resources by residents. Activities such as hunting, fishing, cutting down of trees, livestock grazing and collection of resources in the officially protected wilderness area (where photographic and hunting safaris are conducted) are strictly prohibited and attract various fines. Even in areas outside the wilderness area, reckless use of resources, including random and unselective cutting down of trees, can attract fines. It was observed that the vegetation in the wilderness areas, and even in areas surrounding people's homesteads and fields was lush and dense, which is testimony to the success of the biodiversity conservation initiatives in Mahenye.

When asked whether the conservation-related livelihood benefits were a tool or instrument for community development in their area, 77.3% and 89.3% of questionnaire respondents in Mahenye and Chizvirizvi said yes, respectively (Table 6.31). This shows that most people in the two study areas regarded the conservation-related livelihood benefits their communities were receiving as a form of community development. However, as shall be shown in greater detail later, respondents in both study areas noted that the livelihood benefits from the conservation areas had significantly declined since 2000, partly as a result of the political and economic crisis in the country.

Table 6.31: Whether conservation-related livelihood benefits were a tool for community development (in %)

Conservation a tool for community development	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Yes	77.3	89.3	83.3
No	22.7	10.7	16.7
Total	100	100	100

The respondents who viewed the conservation-related livelihood benefits as a tool for community development were further asked whether these benefits had brought adequate development to their area (Table 6.32). Of these, only 19.8% in Mahenye and 26.9% in Chizvirizvi said the conservation-related livelihood benefits had brought adequate development to their area. Most of the people felt that, while the conservation areas had

contributed towards the upliftment of their livelihoods, the protected areas still needed to do more for there to be adequate development. Many indicated that the conservation areas could bring more meaningful development by funding irrigation, livestock rearing and the introduction of drought-resistant crop varieties. It has been shown earlier that aridity is one of the major constraints to farming in the two study areas.

Table 6.32: If conservation-related benefits are a tool for community development, whether they had brought adequate development (in %)

If conservation development tool, whether it has brought adequate development to community	Mahenye (n=116)	Chizvirizvi (n=134)	Total (n=250)
Yes	19.8	26.9	23.6
No	80.1	73.1	76.4
Total	100	100	100

Questionnaire respondents in Mahenye and Chizvirizvi who did not regard the conservation-related livelihood benefits as a tool for community development were further asked to identify alternative community development activities that they wanted the conservation areas to promote or fund in their communities (Table 6.33). In Mahenye, 73.7% of these respondents indicated that the conservation area should fund irrigated crop production, all respondents said that the conservation area should fund livestock rearing, 41.2% said the conservation area should develop the rural service centre while 91.2% indicated that the conservation area needed to fund infrastructural development projects. In Chizvirizvi, all of these respondents indicated that the conservation area should fund irrigated crop production, livestock rearing and infrastructural development while 12.5% said that the conservation area should expand the rural service centre.

Table 6.33: If conservation not a development tool, alternative community development activities to be funded by conservation areas identified (in %): multiple responses

If conservation not development tool, alternative community development activities to be funded by conservation area	Mahenye (n=34)	Chizvirizvi (n=16)	Total (n=50)
Irrigated crop production	73.7	100	82.0
Livestock rearing	100	100	100
Expansion of rural service centres	41.2	12.5	32.0
Infrastructural development	91.2	100	94

It has been revealed earlier that the majority of those respondents who viewed conservation as a tool for community development also indicated that the conservation areas needed to fund projects such as irrigation and livestock rearing for there to be adequate development in their areas. The results therefore suggest that most people in Chizvirizvi and Mahenye want the conservation areas to support agricultural activities for there to be meaningful development in these areas, in addition to infrastructural development. Commenting on the MCSFS, one participant in a group discussion that was held in the area stated that: "*While Malilangwe was doing well in feeding our children, we would appreciate more if we were not just given food but taught and assisted on how to grow our own food. This way, Malilangwe would more meaningfully contribute towards food security in our community*". With aridity identified as one of the main challenges to farming in both Mahenye and Chizvirizvi, provision of irrigation infrastructure or drought resistant crop varieties could be crucial starting points by the conservation areas. The sustainable livelihoods framework notes that, for development agencies to be more effective, they need to first characterise the vulnerability context in the areas they intend to operate so that they can have an insight into the kinds of factors that have potential to negatively impact on people's livelihoods (Carney, 1998; Scoones, 1998).

6.4 Hindrances to the flow of livelihood benefits from conservation

Various hindrances to the flow of the conservation-related livelihood benefits discussed in the preceding section were identified. These have conveniently been divided into two categories: external and internal hindrances. The external hindrances include all those hindrances emanating from outside the communities deriving livelihood benefits from conservation while internal hindrances refer to those hindrances emanating from within the communities targeted to benefit from the conservation areas.

6.4.1 External hindrances

The granting of appropriate authority to RDCs, instead of local communities, for the management of natural resources in communal areas has been identified as the main external hindrance to the flow of benefits to communities under the CAMPFIRE programme. CAMPFIRE originally aimed at granting communal-area residents territorial rights over defined tracts of land, custody and responsibility over natural resources and the right to benefit directly from the exploitation of the natural resources on their land (Martin, 1986). Compromises were however made during the implementation of the programme, with

appropriate authority for the formal control over wildlife eventually being devolved to RDCs rather than to sub-district local communities as originally planned (Frost and Bond, 2008). As shown earlier, the granting of appropriate authority to RDCs gives them, rather than local communities, the power to sign contracts with hunters and to accrue all the generated income. The issue of devolution has attracted the attention of many researchers worldwide. Most of them have, however, concluded that, in spite of enjoying wide publicity, devolution has rarely been tried (Nelson, 2010; Ribot, 2004; 2006; 2008). In addition, in the few cases where it has been tried, it has often not been completed (Ribot, 2004; 2006). The devolution of appropriate authority for the management of wildlife in the CAMPFIRE programme to RDCs in Zimbabwe is a good example of incomplete devolution. This is because RDCs are an extension of central government. The political ecological framework directs attention to the struggles among diverse actors, both local and non-local, over natural resource access and control (Neumann, 1998; Vayda and Walters, 1999; Wilshusen, 2003) and, in the CAMPFIRE programme, such struggles are clearly reflected in the arguments surrounding the granting of appropriate authority to councils instead of grassroots structures at the sub-district level.

CAMPFIRE Revenue Guidelines stipulate that the RDC should take a 15% levy of gross sport hunting revenue, plus another 26% to be spent on wildlife management activities while the CA receives 4% of gross revenue as a levy from councils. This leaves producer communities with only 55% of gross hunting revenue. Residents of Mahenye expressed displeasure over the current CAMPFIRE revenue allocation model which leaves the community with very little (55%) while council remained with a total of 41% of CAMPFIRE hunting revenue. What further angered Mahenye residents was the fact that the 26% retained by the RDC for wildlife management activities is not being used for its intended purpose. The money has been diverted to other uses by the Chipinge Rural District Council, leaving the Mahenye community with no option but to pay for wildlife management activities such as PAC and the payment of resource monitors, which are supposed to be paid for from the 26% being retained by the RDC.

The retention of 41% of gross CAMPFIRE hunting revenue is in fact a tax on wildlife activities in the communal areas, which makes wildlife less profitable compared with agricultural produce and livestock which are not subject to taxation (Duffy, 2000; Murombedzi, 2001; Nelson, 2010). This in turn reduces the incentive for investing in wildlife production and conservation among communal area residents (Murombedzi, 2001; Nelson,

2010). However, Rihoy and Maguranyanga (2007) have noted that, while responsibility for the provision of various services has been decentralised to RDCs, there has not been commensurate financial decentralisation to enable RDCs to perform these new responsibilities. After decentralisation, central government grants to RDCs now accounted for only 35% of total revenue, with 65% generated locally (Bond 2001; Rihoy and Maguranyanga, 2007). The income generated locally by RDCs has increasingly come from wildlife management activities and, given the deteriorating financial situation of most RDCs due to reduced funding from central government and increased responsibilities, dependence on CAMPFIRE has only increased over the years (Rihoy and Maguranyanga, 2007). Under the above circumstances, RDCs are likely to resist any attempts to devolve appropriate authority to sub-district levels as this will result in the loss of much-needed revenue.

Interviews in Mahenye further revealed that the 55% of gross CAMPFIRE hunting revenue received is further shared with Mutandahwe, a neighbouring ward with which Mahenye shares the same safari hunting concession. The revenue was initially shared equally between the two wards. However, following complaints by the Mahenye CAMPFIRE Committee, Mahenye now gets 80% of the revenue while Mutandahwe gets 20%. The current arrangement was necessitated by the fact that Mutandahwe ward is not endowed with as much wildlife as Mahenye. While the former's quota is just one elephant per year, Mahenye's hunting quota consists of 5-6 elephants annually. At the time of fieldwork, consultations were on-going for Mutandahwe to have its own separate hunting concession. With council retaining 41% of gross CAMPFIRE revenue while Mahenye shares the other 55% with Mutandahwe, residents of Mahenye lamented that it was council which was now benefiting more from the natural resource management programme than the communities originally targeted. One group discussant succinctly described the situation by stating that: "*The Communal Area Management Programme for Indigenous Resources (CAMPFIRE) should change its name to Council Management Programme for Indigenous Resources as it is council which is the main beneficiary of the programme*". A popular sentiment among interviewees in Mahenye was that the CAMPFIRE project should completely be devolved to the ward level so as to allow for all benefits to directly accrue to the community without the costly intermediary role of Chipinge Rural District Council. CAMPFIRE literature indicates that this was the original plan of the programme, which was however changed during implementation (Martin, 1986). At the time of fieldwork, the MCC was in the process of preparing a Trust Deed as a first step in a quest for the full control of the natural resources in

the area by the residents of the community. However, other interviewees preferred a continued but limited role by council in CAMPFIRE, especially through a reduction in the council levy on the natural resource management project, with many indicating that Mahenye should accrue at least 85% of gross CAMPFIRE revenue.

Another hindrance to the flow of conservation benefits identified by most residents in Mahenye surrounded the issue of the hunting quota, particularly the elephant quota. Many people felt that the quota being set for Mahenye was consistently too low considering the huge endowment of elephants and other wildlife in the area and the adjacent Gonarezhou National Park. As shown earlier, the elephant quota for Mahenye was about four elephants per year throughout the 1990s, reaching a maximum of six in 2013. In addition, the Mahenye community has no say over the setting of the quota. While they are asked to submit some suggestions on the quota for each year, the final say lies with the PWLMA in consultation with the council. The community has consistently suggested a quota of between 8-10 elephants annually which has always been reduced to between 4-5 elephants by the PWLMA.

Closely related to the issue of a low hunting quota is the fact that, as shown earlier, the quota in Mahenye is rarely filled or reached by the hunter. Interviews revealed that out of a quota of 6 elephants set for 2013, only 4 elephants were hunted. The unfilled quota translates into loss of revenue for Mahenye residents. While negotiations are made to provide some compensation for the unfilled quota, the negotiated amount is usually lower than the amount that could have accrued to the community had the quota been filled. A study by Mashinya (2007) in the same area noted that the safari hunters usually have many hunting commitments in other areas around the country which makes them fail to fill their quotas in some of the areas.

In addition to the low hunting quota, residents of Mahenye also indicated that the community had no say over the selection of the safari hunting operator. The prerogative to select the hunter rests with council through a tendering process. However, an inquiry conducted in 2005 to review the tendering procedures and processes in Mahenye revealed that a competitive bidding process was not being followed, with money from safari hunting not reflecting the true value of wildlife resources in Mahenye (Rihoy et al, 2010). Many interviewees in Mahenye strongly suspected that council was accepting bribes for the awarding of the hunting concession. Of all the hunters that had operated in Mahenye, most people interviewed preferred Tshabezi Hunters as they consistently paid their quarterly hunting fees

on time. In 2003, Tshabezi Hunters made a once-off payment of their hunting fees amounting up to Z$1 590 000 for the whole year. In addition, Tshabezi Hunters donated a Mazda B 2500 truck to the Mahenye community in 2004 for use as an ambulance for transporting critically ill patients to hospitals in Chipinge or Chiredzi. In 2002, Tshabezi Hunters also donated a short gun, a riffle and uniforms for use in PAC by resource monitors. In contrast, the current hunter, Zambezi Hunters, had a habit of not paying quarterly hunting fees on time. At the time of fieldwork, there were confirmed reports that Zambezi Hunters had not yet paid hunting fees for the previous quarter. In addition, unlike Tshabezi Hunters, many people noted that Zambezi Hunters had not done anything else for the community besides the payment of hunting fees. Zambezi Hunters promised to build Jamanda Bridge in Mahenye in 2003. However, the hunter only laid the foundation and never returned to finish the project. Other unfulfilled promises by Zambezi Hunters to the people of Mahenye included: the purchase of a grinding mill to be run at Mutandahwe Business Centre, restocking of the wilderness area with plains game, assistance with transport and buying of guns and uniforms for use by resource monitors. The result of the total control over the safari hunting tendering process by council has been an outright imposition of the hunter on the Mahenye community.

The political and economic crisis currently affecting the country, which started in 2000, has negatively affected the performance of CAMPFIRE projects throughout the country. This has mainly been felt through a decline in tourist arrivals into the country owing to increased negative international publicity (Clover and Eriksen, 2009), with travel warnings against Zimbabwe issued in most of the major tourist source markets such as German, USA, France and Australia (Mutana et al, 2013). In Mahenye, the decline in tourist arrivals has mainly affected ecotourism. By 2003, the occupancy rate at Chilo Lodge had declined to 20% with foreign tourists accounting for only 2% of the visitors (Mashinya, 2007). The manager of Chilo Lodge indicated during an interview that the lodge had a 35% occupancy rate in 2013 while it needed an occupancy of 45% to make profit. As shown earlier, Mahenye Ward did not receive any money from the lodge in 2013 as management claimed that no profit had been made. Under the current agreement, the lodge gives 10% of annual profits to the Mahenye community.

Concerning sport hunting, a previous research in the same area by Mashinya (2007) revealed that sport hunters were not affected as much by political turmoil as conventional tourists. Similar observations were made in the current research concerning sport hunting trends as there were no reports of declining trophy hunting due to a shortage of hunters. However, the

recent announcement of the suspension of the import of sport-hunted African elephant trophies from Zimbabwe by the United States Fish and Wildlife Services (USFWS) is likely to change the situation soon. This is because the majority of trophy hunting clients for the country come from the USA. In support of its decision, the USFWS has cited ineffective law enforcement and weak governance in the parks estates that have resulted in uncontrolled elephant poaching. The ban will have far reaching consequences for communities such as Mahenye that, as shown earlier, heavily depend on proceeds from elephant trophy hunting for various community development projects.

The decline in tourist arrivals has also affected other income generating activities in Mahenye such as the selling of crafts. One interviewee indicated that the clients for his crafts, who were mainly foreign tourists, had drastically declined in numbers thereby negatively impacting on his sales.

The political and economic crisis also resulted in hyperinflation which reached 1 700% by 2005, rendering worthless the Zimbabwean dollar (Rihoy et al, 2010). The inflation resulted in massive losses of CAMPFIRE cash benefits which undermined community investment projects and also rendered as worthless household cash dividends (Rihoy et al, 2010). In Mahenye, the last household cash dividend of Z$100 given out in 2004 was worth only a mere US$0.03 and was thus virtually useless (Rihoy et al, 2010). While the country adopted a multi-currency regime towards the end of 2009, the problem of low tourist arrivals has persisted.

One of the impacts of the political crisis in the country has been the side-lining of civil organisations from participating in the development arena (Child et al, 2003; Rihoy and Maguranyanga, 2007; Rihoy et al, 2010). The impact of the marginalisation of civil society on CAMPFIRE has been profound, as members of the CCG had played a key role in capacity-building at grassroots level (Rihoy and Maguranyanga, 2007; Child et al. 2003). The CCG also performed a crucial role in CAMPFIRE of providing neutral arbitration when misunderstandings arose among community members (Rihoy and Maguranyanga, 2007). The marginalisation of civil organisations has thus resulted in the loss of critical programme partners for CAMPFIRE. The institutional implications of the marginalisation of civic organisations to the CAMPFIRE project in Mahenye are discussed in the next section on internal hindrances.

Residents of Chizvirizvi also identified some external hindrances to the flow of livelihood benefits from Malilangwe. To begin with, various projects and activities that were being funded by Malilangwe in Chizvirizvi had also been affected by the political and economic crisis in the country. Some projects were stopped completely while others were downsized. An example of projects that had been stopped due to economic constraints included the funding of students at the primary and secondary schools in Chizvirizvi and at some tertiary institutions in the country. The exchange programme that had been forged by Dhumisani Secondary School with a sister school in the USA in 1999 with the help of Malilangwe, was abandoned in 2000 following the increased negative international publicity of the country. The exchange programme had the potential to improve the status of the school in various ways, including through donations from well-wishers. The area of scope for the MCSFS was reduced following the economic decline in the country. As shown earlier, the number of children benefitting from the feeding scheme declined by half from a peak of 45 000 in 2005 to the approximately 22 000 children currently under the scheme. Out of several gardening projects that had been started in Chizvirizvi with the help of Malilangwe, only one at the chief's homestead was operational during the time of fieldwork. The residents of Chizvirizvi that were interviewed also confirmed the above developments.

The director of Malilangwe indicated that the wildlife reserve was a not-for-profit organisation which mainly relied on donor funding. He noted that before the economic crisis, his organisation was able to sponsor various development activities in Chizvirizvi and other surrounding communities. This, however, became more challenging since 2000 when the country's economy started to decline. He further stated that the scrapping of the Zimbabwean dollar due to hyperinflation, and the subsequent introduction of a multi-currency system in 2009, also made it very expensive to sponsor community development projects. While Malilangwe also earns income from ecotourism and lodges, the director indicated that international tourist arrivals had also declined due to the country's current negative publicity.

Most residents of Chizvirizvi interviewed felt that the MPWR was using the community development card merely as a gimmick for attracting donor funding. Residents claimed that the conservation area was receiving a lot of money from various donors meant for community development in adjacent communities. They further alleged that Malilangwe was diverting these community-development donor funds to own use. In response, the director of Malilangwe dismissed as unfounded the above allegations by Chizvirizvi residents. He further noted that the expectations of the residents of Chizvirizvi from Malilangwe were

unsustainably too high and urged them to stop viewing the conservation area as panacea to all their problems. Wolmer et al (2004) have described the community outreach schemes by some private conservation areas in Zimbabwe as cosmetic attempts to maintain the status quo or as 'strategic tokenism' for attracting donor funding. Some of the private conservation areas have embarked on community outreach activities as a survival strategy for gaining political and social legitimacy (Wolmer et al, 2004). It is important to note that the ongoing land reform programme in the country has also affected many private protected areas. On the other hand, one of the major challenges of joining conservation with development often cited in the literature has been a general overestimation of benefits, especially financial benefits, by local communities thereby leading to unfulfilled over expectations (Fabricius, 2004).

Table 6.34 illustrates another external hindrance to the flow of conservation benefits from Malilangwe to Chizvirizvi. When asked to rate the nature of community involvement in conservation-related livelihoods activities by the protected area in their community, all questionnaire respondents in Chizvirizvi rated their involvement as being passive. Respondents said that they were merely at the receiving end of any conservation-development initiatives by Malilangwe in their community. This was further confirmed by responses from interviews and group discussions, where respondents noted that the conservation area usually just announced development projects in their area without first consulting with them on their developmental needs and aspirations.

Table 6.34: Respondents' rating of community involvement in conservation-related livelihood activities in their area (in %)

Respondents rating of community involvement in conservation-related livelihood activities	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Passive (told what is going to happen)	41.3	100	70.7
Information giving (answer questions from extractive researchers)	48.7	-	24.3
Functional (meet predetermined objectives)	7.3	-	3.7
Interactive (joint analysis and action)	2.7	-	1.3
Total	100	100	100

As noted earlier some respondents indicated that, instead of renovating the two primary schools, Malilangwe could have used the money to build another secondary school near Benzi Primary School as the area was in urgent need of a second secondary school. Residents of Chizvirizvi said that, while Malilangwe had done a lot towards uplifting their livelihoods, the conservation area's efforts could bring more benefits if it involved the people in the

identification of developmental needs. Recommendation 5 of the World Parks Congress held in Bali specifically recognised that people living in or near protected areas can support protected area management "if they…are taken into account in planning and operations" (Recommendation 5, World Parks Congress, Bali cited in Scherl et al, 2004: 5). Rastogi et al (2010) further note that it is important to incorporate local perspectives in protected-area policy so as to reduce antagonism arising from the societal implications of protected areas, which can jeopardize the objectives of both conservation and sustainable development. Community involvement and its impact on the flow of conservation-related livelihood benefits in Mahenye are discussed under the next section on internal hindrances.

The external hindrances to the flow of livelihood benefits from the conservation areas to the two communities have some important implications on biodiversity conservation and livelihoods. The hindrances are limiting the effectiveness of the conservation-related livelihood benefits in reducing poverty in the study areas, which in turn has resulted in continued over-reliance on natural resources by residents. It is important to note that the livelihood benefits from the conservation areas are an important incentive among residents for supporting conservation activities.

6.4.2 Internal hindrances

Hindrances to the flow of conservation-related livelihood benefits, which were internal to the communities receiving these benefits, were also identified in both Mahenye and Chizvirizvi. The political ecology framework notes that the struggles for the control of natural resources or the benefits emanating from these resources, can involve various actors at the local level (Neumann, 1998; Vayda and Walters, 1999; Wilshusen, 2003), which may result in the exclusion of others, often the weaker, from benefiting. Various scenarios fitting the above framework were identified in Mahenye and Chizvirizvi.

In Mahenye, audit reports by Chipinge Rural District Council, responses from group discussants and interviews with various key informants provided ample evidence indicating that the MCC was not properly managing the community project. There was evidence of lack of proper accounting systems and procedures for the Mahenye CAMPFIRE project which has led to some financial leakages. Audit reports revealed that the MCC was giving out loans to several people, particularly staff and committee members, and also to individuals and institutions such as schools. However, there was no proper register to control these loans, with hardly any evidence of recovery of funds from the majority of debtors. There was also

evidence that some debtors were getting more loans before paying back previous ones. Another problem revealed in the audit reports was that the payment of loans was being done by the MCC chairman, who appeared to be directly responsible for the management of project finances. The chairman also used his own discretion in selecting loan recipients, by-passing the MCC which is the sole decision-making body for the CAMPFIRE project. It was also not clear whether, or what amount of, interest was being charged for the loans. Under the above circumstances CAMPFIRE funds, which are supposed to benefit the whole community, are now benefitting the 'privileged' few.

The MCC accounting system has also allowed the use of funds without demanding proof of payment. This has resulted in payments with no proof that such payments were bona fide. This appeared to be the case even for purchases from reputable suppliers such as pump stations for fuel and items bought from wholesalers for resale in the CAMPFIRE shop. The absence of proof of payment is cause for serious concern as misuse of funds can certainly not be overruled.

Audit reports also indicated that receipts were not properly being posted to the cash book. Several receipts were either not correctly posted to the cash book or were simply not posted at all. For example, the 2004 audit report noted a receipt for Z$12 800 which was posted to the cash book as Z$ 2 800, giving an understatement of Z$10 000. The same audit report also identified a receipt for Z$90 000 which was posted to the cash book as Z$9 000, resulting in an understatement of Z$81 000. In other cases, some receipts could not be traced to the cash book at all.

Another weakness that was uncovered by the 2001 and 2004 audit reports for the Mahenye CAMPFIRE project involved the banking of cash which was usually done by the chairman. There were a number of occasions where cash was vouched out for banking and entered into the cash book bank column as banked yet no such amounts could be traced to deposit slips or bank statements. This was a clear indication that cash, which was supposed to have been taken for banking, would have been used for other purposes without authorisation by MCC. In addition, there was evidence that the MCC was in the habit of not preparing a bank reconciliation statement. This could be a deliberate move aimed at hiding evidence of misuse of funds. The absence of this vital record further increases the opportunities for the misuse of CAMPFIRE funds.

In June 2004 Z$7 million was withdrawn for the payment of household dividends to the community. However, the actual payment totalled Z$5 415 500, leaving a balance of Z$ 1 584 500. When asked by auditors about the outstanding balance, the then chairman, who was in charge of the payments, said that the money had been used for hiring transport to ferry the cash from Chiredzi Town to Mahenye. There was, however, no documentary evidence to prove this. In any case, it was not possible for the car hire to cost that much, which is another proof of misuse of funds by MCC.

The above discrepancies in the accounting system run by MCC is proof that several leakages are occurring, resulting in the loss of CAMPFIRE revenue which is supposed to benefit all the residents of the area. This highlights the need for training committee members and project staff in basic accounting procedures and expectations. There is also a need to define areas of responsibilities between policy-makers and implementers and ensuring that the CAMPFIRE chairperson is not mixed up in everything from chairing meetings to the handling of cash, which ends up leading to the abuse of project funds.

In addition to a poor accounting system, there is also evidence of poor management of CAMPFIRE projects by MCC. A particular case in point is the shop. At the time of fieldwork, the shop had been divided into two sections: one for CAMPFIRE and the other for the chief. The chief was renting out his section and getting monthly rentals yet the shop is supposed to be a community project. Many residents interviewed expressed dismay in the way the shop was being run as it was now the chief's cash cow. However, those interviewed also said that they could not openly criticise the chief for fear of victimisation. Other issues of concern with the shop included:

- absence of adequate stock levels most of the time
- poor stock control practices
- poor security with doors and windows that cannot properly lock
- everyone in the CAMPFIRE Committee wanting to supervise, with responsibility not placed on a specific person, thereby confusing the shopkeeper

The grinding mill was the main source of income for MCC for the payment of wages to CAMPFIRE workers. However, just as with the shop, there were also poor cash-flow records at the grinding mill. Reports from various interviewees indicated that at times the grinding mill can go for weeks or even months without operating due to lack of funds for repairs or for settling energy bills.

The mismanagement of projects by MCC was also evident in the running of the vehicles under the Mahenye CAMPFIRE project. For example, the Mazda T35 truck generates revenue by ferrying people and goods. However, reports from interviews and group discussions were that the revenue generated by the truck was not fully benefitting the community as most of it was not properly accounted for. As a way of reducing the misuse of funds, the truck driver was now being accompanied by three committee members when ferrying people to and from Chiredzi Town. This measure is, however, not fool proof as these people can still connive to misuse the money. The Mazda B2500 truck that was donated by Tshabezi Hunters for use as an ambulance at the clinic ended up being used by the then CAMPFIRE chairman for offering hiring services, with the money generated not benefiting the community. The vehicle has since broken down.

Sitting allowances for CAMPFIRE committee members, which according to the clerk currently totalled about US$6 500 per year (about US$500 per committee member per year), were one of the major expenditures of the Mahenye CAMPFIRE project. In addition, there was also a high frequency of travelling by committee members requiring subsistence allowances. The allowances were draining project resources. Most residents interviewed said that the CAMPFIRE project does not afford to pay out such huge allowances. People felt that it was unfair for committee members to continue enjoying huge allowances while other community members were no longer receiving household cash dividends. They further argued that, after all, it was the CAMPFIRE Committee which called for the stoppage of the payment of household dividends citing cash shortages. Most community members felt that, by continuing to give themselves huge allowances, the committee members were being hypocritical.

Table 6.31 presented earlier illustrates another important internal hindrance to the flow of conservation-related livelihoods benefits in Mahenye: lack of community involvement in decision-making. When asked to rate the nature of community involvement in terms of decision-making in conservation-related livelihoods activities by the MCC, only 2.7% of questionnaire respondents in Mahenye rated community involvement as being interactive, involving joint analysis and action between the community and the MCC. The majority of the respondents (97.3%) indicated various levels of a more passive community involvement in decision-making as shown in Table 6.31. The first three categories in Table 6.31 (passive, information giving and functional) cannot be considered as falling under the rubric of community conservation as they do not involve local collective action (Barrow and

Murphree, 2001). Only in the last category, where collective activity is involved, is the concept of community conservation or community-based natural resource management embraced (Barrow and Murphree, 2001). The above responses were in tandem with those from interviews and group discussions where most respondents indicated that the MCC was increasingly making unilateral decisions without seeking community approval. A case in point was the construction of new CAMPFIRE offices for resource monitors and the accounts clerk in 2012 where the MCC did not consult the community. The MCC bought 30 bags of cement for the construction project with CAMPFIRE money without informing the community. In another case, a newly elected MCC demolished a school block at Mahenye Secondary School that was being constructed by CAMPFIRE. It later emerged that this was due to infighting within the newly elected committee along political fault-lines. At the time of fieldwork, the sitting CAMPFIRE committee had three ZANU PF members, including the chairperson, while the MDC had four members, including the vice-chairperson. To this day, only the slab has been left of the school block which had reached window level. The interaction between residents and CAMPFIRE committees was also being hampered by the fact that there is only one general meeting held at the end of the year. Respondents during interviews and group discussions indicated that there should be more general meetings per year so as to facilitate collective planning in CAMPFIRE.

A similar study by Rihoy et al (2010) in Mahenye also identified the demise of democratic procedures as a major challenge to the community conservation initiative. As shown earlier, the marginalisation of civil organisations by government from rural development activities since 2000 has resulted in the collapse of many institutions that were being supported by these organisations, including institutions for the running of the CAMPFIRE programme (Raftopoulos and Savage, 2005; Rihoy and Maguranyanga, 2007; Rihoy et al, 2010). In particular, ZIMTRUST's role was to assist in training and institutional capacity building at ward and district levels so as to enhance capacity in meeting new institutional and administrative challenges associated with the CAMPFIRE programme (Duffy, 2000; Olthof, 1995).

When asked to rate the relations between their community and the conservation area (Table 6.35), 45.3% of questionnaire respondents in Mahenye rated them as very good (2%), good (40%) and satisfactory (3.3%). On the other hand, 84.6% of the respondents in Chizvirizvi rated the relations between their community and the conservation area as very good (1.3%), good (74%) and satisfactory (9.3%). Fifty five percent of the respondents in Mahenye rated

community-conservation area relations as either poor or very poor while 15.4% of the respondents in Chizvirizvi also rated them as either poor or very poor.

Table 6.35: Respondents' rating of relations between community and conservation area (in %)

Relations between community and conservation area	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Very good	2.0	1.3	1.7
Good	40.0	74.0	57.0
Satisfactory	3.3	9.3	6.3
Poor	12.7	12.7	12.7
Very poor	42.0	2.7	22.3
Total	100	100	100

The results in Table 6.35 are indicative of better relations between Malilangwe and Chizvirizvi than between Mahenye and the MCC. The respondents were further asked to identify reasons for the stated nature of relations between their community and the conservation area (Table 6.36).

Table 6.36: Respondents' reasons for stated nature of relations between community and conservation area (in %): multiple responses

Reasons for stated community-conservation area relations	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Protected area has respect for local people	8.0	58.7	33.3
Protected area initiates local development projects	45.3	84.7	65.0
Protected area does not interact with the community	53.3	15.3	34.3
Protected area harasses local people	14.7	-	7.3
Protected area does not compensate for losses caused by wildlife	54.0	12.7	33.3

As revealed in Table 6.36, 53.3% of the respondents in Mahenye identified limited interaction as one of the major reasons for the poor relations between their community and the MCC. This echoes and reinforces an earlier observation identifying lack of community involvement in decision-making in conservation-related livelihoods activities by the MCC as one of the major internal hindrances to the flow of CAMPFIRE benefits.

Another internal hindrance to the flow of conservation benefits in Mahenye emanated from the undue influence on the CAMPFIRE project by the chieftaincy. It is important to note that the first CAMPFIRE chairman in Mahenye was the chief, who is now late. The second

CAMPFIRE chairman, who is brother to the late chief, has served in that capacity for about four times now, and was the sitting chairperson during the time of fieldwork. Another nephew of the late chief has also previously served as acting CAMPFIRE chairman. Information gathered through group discussions and interviews in Mahenye indicated that most people who had served as chairmen or committee members in the CAMPFIRE Committee were either related to the chieftaincy or were close acquaintances. The CAMPFIRE Chairperson for 2005 was never elected but was imposed by the chief after the duly elected chairperson had left the ward due to alleged misappropriation of CAMPFIRE funds (Rihoy et al, 2010). Under such circumstances, CAMPFIRE in Mahenye is now synonymous with the chief, which has compromised the integrity of the community project.

It was also interesting to discover that the chief, who was not a committee member, was getting a monthly allowance of US$40 from CAMPFIRE. As already shown, the chief also now runs the other half of the CAMPFIRE shop, a community project, for his own benefit. Interviews also revealed that sometimes the chief asks for CAMPFIRE money to cover his personal travelling costs or for beer drinking. It was also revealed through group discussions and interviews that, at times, the chief asks for money from CAMPFIRE for sponsoring ZANU PF meetings in the ward, with any dissenters accused of being MDC supporters. In this case, the chief is now additionally using politics for the abuse of the CAMPFIRE project. As shown earlier, the traditional leadership deducted a 'district development levy' of Z$6 000 from the last dividend pay-out of Z$6 100 per household in 2004, leaving only Z$100 for the households. The validity of this deduction was never verified (Rihoy et al, 2010).

The stranglehold of the chieftaincy on CAMPFIRE was also evident in the filling of the employment opportunities being generated by the project in Mahenye. For example, the CAMPFIRE secretary was also employed as the head of the bar at Chilo Lodge. A study by Mashinya (2007) in the same area also revealed that most of the jobs allocated for locals at Chilo Lodge and the now-closed Mahenye Lodge were being taken by the ruling clan and its allies, particularly since 2000. She cited particular cases of the then CAMPFIRE chairman (who is also the current chairman) and the then deputy chairman closely related to the chief, who were employed by Chilo Lodge as community tourism officer and head chef, respectively.

Female respondents interviewed indicated that women were being marginalised from benefitting in the CAMPFIRE project in Mahenye. Of particular concern among most

interviewed women was the fact that most jobs that were being generated by the CAMPFIRE project had been taken up by men. This is cause for serious concern particularly for female-headed households struggling for survival. Income from conservation employment could make a significant impact on the livelihoods of these households. Some married women, however, indicated that even if they were to get the jobs, their husbands, who were hard-core traditionalists, were unlikely to let them go and work. The above cases indicate that patriarchy is also a major internal hindrance to the flow of conservation benefits in Mahenye.

The above internal hindrances to the flow of conservation benefits raise some scepticism over the prospects of allowing full devolution of the CAMPFIRE project to the Mahenye community as this might allow greater misappropriation and mismanagement of project resources by a few individuals. An angry participant at the group discussion held in Mahenye lamented that "*our community used to benefit very much from CAMPFIRE when the project started but now some greedy individuals are taking most of the benefits to themselves and they are just getting away with it*". Several issues have to be taken into consideration before such devolution can be entertained. Literature on community-based natural resource management has noted that local people's ability to manage and administer revenues from natural resources is primarily weak, partly because, due to decades of poverty and experiences of being marginalised, the temptation to be corrupt is often too great (Fabricius, 2004). The elite often try their best to gain a disproportionate share of the benefits from biodiversity projects (Fabricius, 2004). This appears to be exactly what is transpiring in Mahenye.

Fewer internal hindrances to the flow of livelihood benefits from Malilangwe to Chizvirizvi were identified. This could be attributed to the fact that, unlike CAMPFIRE which is a community-run project, there were fewer activities being run at community level in Chizvirizvi than in Mahenye. Most activities in Chizvirizvi were being run directly from Malilangwe, which has reduced chances of corrupt practices by some members of the community at the expense of others as is the case in Mahenye. For those livelihood projects sponsored by Malilangwe that were being run by Chizvirizvi residents such as the feeding scheme, there were no reports from interviewed respondents indicating the marginalisation of anyone. Lessons could probably be learnt by Mahenye residents from Chizvirizvi, which could reduce internal hindrances and improve the sharing of livelihood benefits from CAMPFIRE: maybe hiring a professional private entity to run the CAMPFIRE project on behalf of Mahenye residents.

However, there were few cases echoing some resemblances with the situation in Mahenye concerning internal hindrances to the flow of benefits. For example, there were some reports that the chief for Chizvirizvi and surrounding areas was now the sole owner of the only remaining gardening project in Chizvirizvi, as all other gardens have collapsed due to lack of borehole maintenance by Malilangwe. Allegations from some respondents were that one has to pay some money to the chief for them to get a portion in the community gardening area. One respondent noted that "*Malilangwe is using the divide and rule tactic by ignoring all the other members of our community while sponsoring a few influential individuals in our society. This is why the garden at the Chief's homestead is the only one operating*". In another case, reports from interviewed respondents indicated that for one to secure employment in Malilangwe, they had to be recommended either by the chief or by someone already working at the conservation area. This has marginalised all Chizvirizvi residents not acquainted with the chief or without friends or relatives already working at Malilangwe.

Just as with external hindrances above, the internal hindrances to the flow of livelihood benefits from conservation are also limiting the effectiveness of these benefits in reducing poverty in the study areas, thereby perpetuating the dependence of the residents on natural resources for livelihoods. As these hindrances are emanating from within the communities themselves, their impact as disincentives for supporting conservation activities among residents are likely to be greater compared to the external hindrances. Measures should therefore be adopted so as to reduce or eliminate both the internal and external hindrances to ensure the flow of livelihood benefits from the conservation areas to the communities.

6.5 Community livelihood costs from conservation

An earlier section has identified various livelihood benefits from the conservation areas to the Mahenye and Chizvirizvi communities. The study also sought to establish the livelihood costs being incurred by the residents of Mahenye and Chizvirizvi from the conservation areas and these are presented and discussed in this section.

Table 6.37 summarises some of the livelihood costs to the residents of Mahenye and Chizvirizvi from the conservation areas. The majority of questionnaire respondents in Mahenye (54.7%) and Chizvirizvi (98%) indicated that the conservation areas had curtailed their access to resources they had traditionally accessed and used in the past. In addition, 83.3% of the respondents in Mahenye and 70% of the respondents in Chizvirizvi indicated that the conservation areas had led to loss of land and livelihoods. This is in agreement with

conservation literature stating that most adjacent communities historically predate protected areas, have pre-existing rights to resources in them and have often been adversely affected by their designation (Buta et al, 2014). The setting up of most protected areas in Zimbabwe has resulted in the displacement and resettling of the people who originally inhabited these areas (Child, 2009a; Muboko and Murindagomo, 2014).

Table 6.37: Costs to the community from living within/near conservation area (in %): multiple responses

Conservation costs to community	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Curtailed access to traditionally used resources	54.7	98.0	76.3
Loss of land and livelihoods	83.3	70.0	76.7
Destruction of crops by wildlife	100	30.7	65.3
Human harassment by wildlife	100	15.3	57.7
Harassment by conservation enforcement agents	31.3	-	15.7
Competition for water and grazing in dry season	48.0	-	24.0
Cannot expand agricultural land	11.3	-	5.7

It is important to note that both the Mahenye community-based conservation area and the MPWR have been established in areas that were once inhabited by people. In the case of Malilangwe, the area now occupied by the private conservation area was once settled by the people who now stay in Chizvirizvi. The people were displaced and resettled during the colonial period in the 1920s and the responses in Table 6.37 are a clear indication that such memories are still fresh in their minds. One interviewed resident of Chizvirizvi indicated that "*the land now occupied by Malilangwe was stolen from our ancestors by colonialists*". Some respondents further indicated that the soils in Malilangwe were actually more fertile compared to those in Chizvirizvi, though the AREX officer for the area noted that Malilangwe and Chizvirizvi basically shared the same adaphic characteristics. However, some respondents said that they were no longer bitter about the lost land as, with the help of Malilangwe, they have been able to get the relatively large pieces of land they now occupy.

In the case of Mahenye, the setting aside of 15 000 hectares of land for the establishment of the wilderness area for use as a safari and photographic hunting area also represents loss of land and livelihoods and curtailed access to traditionally used resources. In addition, about one hundred people were moved from Ngwachumene Island in the middle of the Save River to the mainland, leaving this prime wildlife habitat free from human occupation. The island is now part of the wilderness area. The people of Mahenye agreed to establish the wilderness

area in anticipation of benefiting from conservation activities under the national CAMPFIRE initiative. However, many respondents in Mahenye noted with concern that, since 2000, they were no longer benefitting from the CAMPFIRE programme as much as they had anticipated.

It has been shown earlier that residents of Mahenye have small landholdings averaging about 2.3 hectares per household. With this in mind, it was therefore not surprising when 11.3% of questionnaire respondents in the area indicated that one of the livelihood costs they were incurring from conservation was that they cannot expand their agricultural land (Table 6.37). The 15 000 hectares set aside for wildlife conservation could certainly make a huge difference for these people in terms of access to land. With approximately 1 000 households in Mahenye, each household could add another 15 hectares of arable land to what they already have if the wilderness area were to be divided among the residents. CAMPFIRE should therefore provide enough benefits to offset such huge opportunity costs associated with wildlife conservation such as foregone agricultural production and collection of forest products.

Questionnaire respondents in both Mahenye and Chizvirizvi were asked whether they required access into the protected areas for various resources or activities (Table 6.38). The responses showed that some people were willing to access Malilangwe and the Mahenye wilderness area for various resources and activities. There were, however, more respondents in Mahenye requiring access into the protected area for various resources and activities than in Chizvirizvi. This was most probably due to the fact that residents of Chizvirizvi had larger landholdings which enable most people to meet their resource needs than those in Mahenye.

Table 6.38: Whether respondents required access into protected area for various resources/ activities (in %): multiple responses

Resource/ activity required in conservation area	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Livestock grazing	54.0	12.7	33.3
Recreation	83.3	82.0	82.7
Food gathering	88.7	16.7	52.7
Hunting	58.7	16.7	37.7
Fishing	68.7	19.3	44.0
Cultivation	26.7	12.7	19.7
Fuelwood collection	43.3	16.7	30.0
Collection of thatching grass	66.7	16.7	41.7
Fetching of water	27.3	16.7	22.0
Cultural/ social activities	82.0	44.0	63.0

The responses in Table 6.38 confirm those in Table 6.37 where relatively large numbers of the respondents in both Mahenye and Chizvirizvi had indicated that the setting up of the conservation areas had resulted in loss of land and livelihoods and had also curtailed residents from accessing traditionally used natural resources. The conservation authorities in both conservation areas however indicated that no one was allowed access into the protected areas for any activities, except for recreation in Malilangwe. However, authorities in Malilangwe further indicated that local residents willing to visit the protected area for recreation were treated the same way as any other visitors, with no special favours.

Questionnaire respondents in Mahenye and Chizvirizvi were further asked whether they sometimes illegally collected resources from the protected areas (Table 6.39). In Mahenye, 31.3% of the respondents admitted that they sometimes illegally collected resources from the wilderness area. However, most of those who admitted that they sometimes illegally collected resources from the wilderness area indicated that they started doing so as a reaction to dwindling community benefits from the CAMPFIRE project. They further noted that mismanagement of CAMPFIRE by most elected committees, especially after 2000, was partly to blame for the decline in benefits and, therefore, poaching was, in a way, an expression of their displeasure towards these developments in the community project. There were no respondents in Chizvirizvi who indicated that they sometimes illegally collected resources from Malilangwe. The Chizvirizvi residents noted that the security in Malilangwe was too tight to allow them to sneak in and poach for resources.

Table 6.39: Whether respondents sometimes unofficially/ illegally collected resources from protected area (in %)

Illegal collection of resources in conservation area	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Yes	31.3	-	15.7
No	68.7	100	84.3
Total	100	100	100

Interviews with resource monitors in Mahenye confirmed that poaching increased after 2000 as benefits from CAMPFIRE started to decline. This was further confirmed by other key informants who noted that there was no strong reason anymore why people should not collect resources from the wilderness area as they were no longer getting any meaningful benefits from the Mahenye CAMPFIRE project. This explains why 31.3% of the respondents (Table 6.37) in Mahenye indicated that they were being harassed by conservation enforcement

agents or resource monitors. This was due to their poaching activities. Asked whether they would report poachers to the conservation authorities, only 34% of questionnaire respondents in Mahenye said yes against 69.3% of the respondents who also said yes in Chizvirizvi. This clearly reflects a decline in the popularity of the CAMPFIRE project among the residents of Mahenye as a result of declining benefits. Appropriate measures need to be taken in Mahenye so as to revive the CAMPFIRE project and its benefits to residents if poaching is to decline to pre-2000 levels.

All questionnaire respondents in Mahenye and 30.7% of the respondents in Chizvirizvi (Table 6.37) indicated that their crops were frequently destroyed by wild animals from the conservation areas. Various researchers across the world (Agarwala et al, 2010; Bulte and Rondeau, 2007, Liu et al, 2010) have identified crop damages by wildlife as one of the main challenges faced by communities living adjacent to protected areas, with elephant raids in Cameroon reported to be destroying up to 70% of family production (Bulte and Rondeau, 2007). Considering the fact that farming is the main livelihood occupation for the majority of households in the study areas, the destruction of crops by wild animals from the conservation areas represents a major livelihood cost. The situation was worse in Mahenye as there is no fence separating people's fields or homesteads from the wilderness area. In addition, there is also no fence to separate the Mahenye community from the nearby Gonarezhou National Park, the main source of wildlife for ecotourism and sport hunting activities in Mahenye. The main problem animals identified by residents in Mahenye in the destruction of their crops were elephants, monkeys and baboons, bush pigs, bush bucks, hippos and porcupines among other wild animals. Many respondents in Mahenye indicated that sometimes they do not harvest anything from their fields due to the wild animals. One interviewee in Mahenye noted that "*we are now farming for elephants. The elephants usually come when our crops are just about to mature. What pains us most is that nothing is being done about it by CAMPFIRE*".

Destruction of crops in Chizvirizvi by wildlife from Malilangwe was not as severe as in Mahenye. This was mainly because the private wildlife reserve has an electric fence around its whole perimeter. The ecologist for Malilangwe indicated that only a few breaks by bull elephants can take place and, due to constant surveillances around the fence, most such breaks are detected and prevented. He, however, further noted that other nearby conservation areas such as Gonarezhou National Park, Chiredzi River Conservancy and Save Valley Conservancy, among others, had no electric fences around them which allow many wild animals to escape and destroy crops in surrounding communities, including Chizvirizvi.

Information gathered through interviews and group discussions in Chizvirizvi identified quelea birds from Malilangwe as the major threat to their small-grained crops such as sorghum, millet and rapoko. This was also confirmed by the resident ecologist for Malilangwe who indicated that the private conservancy provided excellent habitat for approximately 400 bird species including quelea birds. Small grains are favoured by many farmers in both Chizvirizvi and Mahenye as they are more resistant to drought compared to large-grained crops such as maize. Unfortunately, the small grains are also a favourite for birds. As shown earlier, aridity is one of the major challenges to farming in these areas. The destruction of crops by birds and other wild animals can significantly reduce already low harvests in these areas thereby exacerbating the poverty profiles of households in these communities. One group discussant in Chizvirizvi lamented that "*I was supposed to harvest at least 5 bags of sorghum from my crop last year but I only managed to get 3 bags due to quelea birds*". With as much as 40% of the harvest being lost to quelea birds, the above scenario highlights the magnitude of the crop losses being incurred by the residents of Chizvirizvi due to the bird infestations from Malilangwe. This has important implications on people's livelihoods as farming is their main economic activity and survival strategy. Also, destruction of crops by wildlife may help in cultivating negative attitudes towards conservation in the area.

Interviewees in Mahenye indicated that they were not receiving any compensation from CAMPFIRE for the destruction of their crops by wild animals. The interview with the CAMPFIRE chairperson indicated that the community had not yet come up with a comprehensive compensation policy for damages incurred by residents from wildlife. While PAC was being conducted in the area, it was not effective due to several reasons. The Chief Resource Monitor indicated that there were currently only 4 resource monitors against a recommended total of 12. In addition, the resource monitors were poorly equipped for them to effectively confront and deter wild animals such as elephants and lions. Responsibility for the payment of resource monitors has also persistently remained a grey area in the Mahenye CAMPFIRE project. While Chipinge Rural District Council retains 26% of gross CAMPFIRE hunting revenue for wildlife management, the money is not being used for its intended purpose. The Mahenye community is currently paying for PAC from its CAMPFIRE revenues. Respondents in Chizvirizvi also said that they were not receiving any compensation from Malilangwe for the destruction of their crops by quelea birds.

Competition for water and grazing, especially in the dry season, was also identified as another livelihood cost by 48% of questionnaire respondents in Mahenye (Table 6.37). It is worth noting that, besides subsistence crop production, pastoralism is also a major livelihood occupation for Mahenye residents. The people of Mahenye were traditionally nomadic pastoralists, whose way of life was affected by the advent of colonialism (Murphree, 2001). The constant mixing of livestock with wild animals poses another livelihood threat to Mahenye residents - disease transmission to livestock. Interviews with residents revealed that there were some suspected cases of foot and mouth in the area in 2012 which were reported to the Veterinary Department. Other diseases that can potentially be transmitted from wildlife to livestock in the area include anthrax and rabies. The transmission of diseases from wildlife to livestock has been recognised as a major challenge for communities living adjacent to conservation areas (Chaminuka et al, 2014; Liu et al, 2011). Such diseases have the potential to inflict huge livelihood loses to livestock-dependent rural households through direct mortality, reduced productivity or reduced marketing opportunities (de Garine-Wichatitsky et al, 2013). The diseases can also eventually be transmitted to humans, especially through consumption of flesh from infected livestock. de Garine-Wichatitsky et al (2013: 322) note that "wildlife has been confirmed as a source of major emerging diseases such as highly pathogenic H5N1 or SARS that have resulted in pandemics during the last decades". Communities living adjacent to conservation areas are therefore particularly at risk of infection from emerging pathogens (de Garine-Wichatitsky et al, 2013).

Wild animals such as lions, leopards, crocodiles and hyenas were also reported to having attacked livestock in Mahenye. Studies from across the world have identified predation on livestock by wildlife as a major livelihood concern for communities living at the periphery of protected areas (Maclennan et al, 2009). For example, studies in eastern and southern Africa revealed that annual losses due to livestock predation ranged from 1% to 25% of potential revenue (Bulte and Rondeau, 2007). Stock losses to carnivores can be particularly damaging on communal lands where livestock production is an important economic activity (Maclennan et al, 2009; Muhly and Musiani, 2009). There were no reports of disease transmission from wild animals or attacks of livestock by wildlife in Chizvirizvi. However, the ecologist at Malilangwe noted that there had been several outbreaks of wildlife diseases in the conservation area, particularly anthrax. These disease outbreaks were, however, being prevented from spreading to surrounding communities by the electric fence.

In addition to the destruction of crops by wildlife, all questionnaire respondents in Mahenye and 15.3% of the respondents in Chizvirizvi (Table 6.37) indicated that wildlife was also harassing people in these areas. An interview with the Chief Resource Monitor for the Mahenye CAMPFIRE project revealed that at least eight people had been killed by wildlife since the start of the CAMPFIRE project in 1990, while several others had sustained some injuries. Animals that constantly attacked people included elephants, crocodiles and snakes. A woman working in her field was attacked and killed by an elephant on 22 September 2012 living her three months old baby unattended for hours until police arrived at the scene. Literature on human-wildlife conflicts identifies attacks on humans by wildlife as a major concern worldwide. For example, Bulte and Rondeau (2007) note that human deaths due to confrontations with elephants rose to 300 between 2000 and 2004 and to 605 between 1994 and 2006 in the Indian states of Jharkhand and Assam, respectively. When a person is injured by a wild animal, CAMPFIRE gives US$40 as clinical assistance for the treatment of the person at the local clinic. However, as the sister-in-charge at Mahenye clinic indicated earlier, the clinic has limited capacity to attend to serious cases such as attacks by wild animals. If the injury is critical, CAMPFIRE additionally provides transport or pays for transport costs for the injured person to be transported to hospitals in nearby towns. When a person is killed by a wild animal, CAMPFIRE only assists with funeral expenses. There is thus no compensation for the injury or death of a person from wildlife. The injury or death of persons due to attacks by wild animals can have significant livelihood impacts for affected households, especially where the affected person was the main household provider. No reports confirmed any wildlife-related deaths or injuries in Chizvirizvi. However, interviews with some school authorities in Chizvirizvi indicated that some children who stayed far from school often absconded or arrived late due to fear of attacks by wild animals that would have been spotted in the community.

Another livelihood cost that was indicated by residents in both Mahenye and Chizvirizvi involved foregone development assistance from various agencies operating in nearby areas. Respondents in both Mahenye and Chizvirizvi noted that, very often, they were side-lined by other rural development organisations which argued that these communities were already getting enough development assistance from CAMPFIRE and Malilangwe, respectively. Yet, as the residents in the two study areas put it, they were not getting enough development aid from the conservation organisations. One respondent in Mahenye noted that in this case,

"*CAMPFIRE has now become a curse rather than a blessing by alienating our community from potential development aid agencies*".

This section has shown that the conservation areas have brought various livelihood costs to both Mahenye and Chizvirizvi. The livelihood costs from the conservation areas have been exacerbated by lack of compensation for losses incurred by residents such as destruction of crops, loss of livestock and injuries and deaths of humans due to attacks by wildlife. Such losses may lead to the development of negative attitudes towards wildlife and protected areas (Schwerdtner and Gruber, 2007). For example, Bulte and Rondeau (2007: 312) note that "most of the 265 elephants that have died in Assam between 1994 and 2006 were killed in retaliation for destroyed crops by angry villagers who used poison-tipped arrows and baits of poison-laced food". Similarly, lions have been killed in the Amboseli-Tsavo ecosystem in Kenya by Maasai pastoralists either in retaliation for livestock killed or in defense of livestock (Maclennan et al, 2009). Other communities around protected areas have resorted to poaching in retaliation for the various inconveniences from wildlife. The above retaliatory activities by communities adjacent to protected areas may lead to reductions or even extinctions of affected wildlife populations. Lack of compensation for wildlife damages to residents of both Mahenye and Chizvirizvi is in spite of literature evidence indicating that compensation for wildlife damages can be relatively cheap to implement in poverty-stricken areas and is readily accepted by local communities (Bulte and Rondeau, 2007). The conservation areas therefore need to take measures so as to reduce these livelihood costs, including compensation for wildlife-related losses incurred. In addition, and as highlighted earlier, measures also need to be taken by both the conservation areas and the two communities so as to eliminate the earlier identified hindrances to the flow of conservation benefits. This will help in maximising livelihood benefits from the conservation areas to the communities, which will in turn create positive attitudes towards the conservation areas, in addition to increasing tolerance towards wildlife.

6.6 The state of biodiversity in conservation areas

Proponents of strict protection have often argued that pursuing conservation with development does not protect biodiversity (Kramer et al, 1997; Kramer and van Schaik, 1997). They view conservation and development as conflicting goals, with sustainable use eventually leading to the depletion of biodiversity (Robinson, 1993). They have often cited the failure of ICDPs in effectively safeguarding protected area core zones as evidence of the

incompatibility of conservation and development goals (Agrawal and Redford, 2006; Brandon et al, 1998a; Wells and Brandon, 1992). On the other hand, those in favour of linking conservation with development argue that this can be the only way to safeguard protected areas, especially where they are surrounded by poor communities (Wilshusen et al, 2002). They further argue that pursuing conservation with development helps protected areas to become socially and politically acceptable (Scherl et al, 2004). In light of the above, the study sought to establish the status of biodiversity in the two conservation areas, that is, the Mahenye community-conserved area and MPWR. As shown earlier, both protected areas were pursuing conservation linked with development goals.

Questionnaire respondents in both Mahenye and Chizvirizvi were asked about their perceptions on the state of biodiversity just before the establishment of the Mahenye wilderness area and MPWR respectively (Table 6.40). The majority of the respondents in Mahenye (94.7%) indicated that biodiversity was abundant in the area now occupied by the wilderness area, while 24% of the respondents in Chizvirizvi also said that biodiversity was abundant in the area now occupied by Malilangwe just before the establishment of the conservation area. In Mahenye, 1.3% of the respondents said that the biodiversity in the area now occupied by the community conservation area was threatened just before the establishment of the protected area, while 4% indicated that they did not know what the state of biodiversity was just before the establishment of the conservation area. In Chizvirizvi, 4.7% of the respondents indicated that biodiversity was threatened just before the establishment of the conservation area, 45.3% said it was scarce, while 26% said they did not know what the state of biodiversity was just before the establishment of the conservation area.

Table 6.40: Respondents' perceptions on the state of biodiversity just before the establishment of conservation areas (in %)

Perceptions on the state of biodiversity just before establishment of conservation area	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Abundant	94.7	24.0	59.3
Threatened	1.3	4.7	3.0
Scarce	-	45.3	22.7
Don't know	4.0	26.0	15.0
Total	100	100	100

The majority of key informants in Mahenye, including the Chief Resource Monitor, also indicated that biodiversity was abundant in the area now occupied by the wilderness area just before its establishment. This was in tandem with the views of questionnaire respondents in Table 6.40. The MPWR was formed in 1994 when the Malilangwe Trust purchased Lone Star Ranch and a neighbouring property, forming one of the largest private game reserves in the country. The wildlife reserve was formed at a time when farmers in the south-east lowveld were beginning to move away from cattle ranching towards game ranching due to persistent droughts which had made cattle ranching less profitable (Bond and Cumming, 2006; Child, 2009b; Wolmer et al, 2004). The ecologist for Malilangwe indicated that wildlife ranching was thus not yet well established during the time just before the establishment of Malilangwe. This confirms the views of questionnaire respondents in Chizvirizvi (Table 6.40) where 50% said that biodiversity was either scarce or threatened just before the establishment of Malilangwe, with only 24% describing biodiversity in the area as abundant during this time. Since the area was still being used mainly for cattle grazing, its biodiversity (wild plants and animals) was therefore limited.

When further asked about the current state of biodiversity in the conservation areas (Table 6.41), 84.7% of the respondents in Mahenye described the biodiversity as abundant, while 72% of the respondents in Chizvirizvi also described it as abundant. Twenty eight percent of the respondents in Chizvirizvi said they did not know the current state of biodiversity in Malilangwe while 4% of the respondents in Mahenye also said they did not know the current state of biodiversity in the community-conserved wilderness area. In Mahenye, 11.3% of the respondents described the current state of biodiversity in the wilderness area as either threatened or scarce, while no questionnaire respondent in Chizvirizvi described the biodiversity in Malilangwe as either scarce or threatened.

Table 6.41: Respondents' perceptions on the current state of biodiversity in the conservation areas (in %)

Perceptions on the current state of biodiversity in the conservation areas	Mahenye (n=150)	Chizvirizvi (n=150)	Total (n=300)
Abundant	84.7	72.0	78.3
Threatened	6.0	-	3.0
Scarce	5.3	-	2.7
Don't know	4.0	28.0	16.0
Total	100	100	100

There are some remarkable differences between the responses in Table 6.40 and those in Table 6.41 by the same respondents. Seventy two percent of the respondents in Chizvirizvi (Table 6.41) indicated that biodiversity in Malilangwe was currently abundant, up from 24% (Table 6.40) who had described biodiversity in the same conservation area as abundant before the establishment of the conservation area. This seemed to highlight a significant increase in biodiversity in Malilangwe. On the other hand, 84.7% of the respondents in Mahenye indicated that biodiversity in the wilderness area was currently abundant, down from 94.7% (Table 6.40) who had described biodiversity in the same area as abundant before the establishment of the conservation area. In addition, 11.3% of the respondents in Mahenye described the current state of biodiversity in the community conservation area as either threatened or scarce, yet only 1.3% had described the biodiversity in the same area before the establishment of the conservation area as threatened. This seems to indicate some decline in biodiversity in the Mahenye wilderness area. When further asked whether biodiversity was declining in the conservation areas since their establishment, only 11.3% of questionnaire respondents in Mahenye said yes, 84.7% said no, while the remaining 4% said they did not know whether biodiversity in Mahenye was declining or not. The majority of the respondents in Mahenye therefore felt that biodiversity was not declining. There was no respondent in Chizvirizvi who indicated that biodiversity was declining in Malilangwe. Seventy two percent of the respondents in Chizvirizvi indicated that the biodiversity of Malilangwe was not declining while 28% said they did not know whether the biodiversity in the protected area was declining or not. Again, as in Mahenye, the majority of the respondents in Chizvirizvi indicated that biodiversity was not declining in Malilangwe.

The questionnaire respondents in Mahenye who had indicated that biodiversity was declining in the wilderness area (11.3%) were further asked to identify decline indicators (Table 6.42). As Table 6.42 shows, 58.8% claimed that some wild animals were no longer seen in the wilderness area, 23.5% indicated that vegetation cover and wild animal populations were declining in the community conservation area, 17.6% noted declining wild animal populations while 5.9% cited declining vegetation cover.

Table 6.42: If biodiversity was declining, decline indicators (in %): multiple responses

If biodiversity was declining in conservation area, decline indicators	Mahenye (n=17)
Declining vegetation cover	5.9
Declining wild animal populations	17.6
Declining vegetation cover and wild animal populations	23.5
Some wild animals are no longer seen in the area	58.8

When further asked to identify the major factors behind the alleged decline in biodiversity in the community wilderness area in Mahenye (Table 6.43), the majority of the respondents (94%) cited poaching as the major driver of biodiversity decline, 29.4% noted ineffective conservation approaches, another 29.4% cited over-reliance on natural resources by locals, 17.6% cited increasing human populations, another 17.6% noted climate change while 5.9% cited developments and land-use changes around conservation areas as causes of biodiversity decline.

Table 6.43: If biodiversity was declining, major contributory factors (in %): multiple responses

If biodiversity was declining in conservation area, major contributory factors	Mahenye (n=17)
Ineffective conservation approaches	29.4
Increasing human populations	17.6
Over-reliance on natural resources by locals	29.4
Poaching and illegal encroachment	94.0
Developments and land use changes around conservation area	5.9
Climate change	17.6

The claims by 11.3% of questionnaire respondents that biodiversity was declining in the Mahenye wilderness area were, however, contested by other key informants who noted that, on the contrary, biodiversity was actually increasing in the community conservation area. The Chief Resource Monitor indicated that, while incidences of poaching had indeed increased since 2000, mainly due to declining CAMPFIRE benefits to the community, illegal access to resources in the conservation area had not yet reached levels serious enough to cause biodiversity decline. According to the Chief Resource Monitor, the increase in poaching in Mahenye after 2000 was in fact a show of protest by residents for declining CAMPFIRE benefits, and could suddenly decline, or even disappear, if such benefits were restored. As presented earlier in Table 6.39, 31.3% of questionnaire respondents in Mahenye admitted that

they sometimes illegally collected resources from the wilderness area. The Chief Resource Monitor further noted that the poaching that was occurring in the wilderness area was for subsistence purposes by local people, with no commercial poachers, capable of causing serious biodiversity decline, involved. He, however, warned that measures should be taken urgently, so as to deter poaching before it threatens wildlife numbers. He further argued that the resource monitors regularly carried out some ground-based game counts in the wilderness area. The Chief Resource Monitor further noted that such game counts have consistently indicated that the populations of animal species in the conservation area are healthy, with no evidence of decline noted to date. He further stated that, based on these game counts, the MCC has persistently called for an increase in its hunting quota, especially for elephants. Efforts to get records of the game counts were however futile due to poor record keeping. Only game counts covering an earlier period (June 1998 to May 1999) could be accessed from other secondary sources (Table 6.44). The Chief Resource Monitor noted that poor record keeping was a major challenge for the Mahenye CAMPFIRE project. This problem was also cited in some of the audit reports by Chipinge Rural District Council. The records were usually lost during the hand-over and take-over period when new officers are elected.

Table 6.44: Analysis of wildlife game counts in Mahenye wilderness area, 1998-1999

Species	**Jun-Aug 1998**	**Sept-Nov 1998**	**Dec-Feb 98/99**	**Mar-May 1999**	**Unclassified***	**Total**	**Average**
Elephant	268	186	540	227	175	1396	279.26
Buffalo	4	13		4	2	23	4.6
Kudu	37	27	145	160	32	401	80
Nyala	4	11	17	18	11	61	12.2
Bushbuck	51	12	22	146	23	254	50.8
Waterbuck	33	28	90	56	49	256	51.2
Warthog	24		19	109		152	30.4
Impala	6	17		13		36	7.2
Duiker	41	33	21	114	39	248	49.6
Klipspringer	52	10	216	80	30	388	77.6
Suni	27	5	7	68	14	121	24.2
Grysbok	8	50	26	284	19	384	77.4

Source: ART (2002: 7)

*****Unclassified forms relate to those that had no dates but were completed during the period 01 June 1998 – 31 May 1999

The game counts data in Table 6.44 are certainly not adequate for historical trend analysis, but can give an idea of the species complement in the Mahenye wilderness area. The

wilderness area shares an unfenced boundary with the adjacent Gonarezhou National Park. This boundary, marked by the Save River, allows many animals to cross over from the national park into the community conservation area especially during the dry season when water levels are low. There has been a significant increase in the populations of various wildlife species, particularly elephants, during the last few decades in Gonarezhou National Park (Zimbabwe PWLMA, 2011). The national park is reported to have an estimated population of between 9000 and 11000 elephants whose numbers continue to grow. In addition, population estimates of three game species (elephant, buffalo and zebra) carried out in Gonarezhou in a stratum adjacent to Mahenye showed some healthy populations comprising 1335 elephants, 3156 buffalo and 78 zebra (Table 6.45) (ART, 2002). With a porous boundary between Gonarezhou and Mahenye, a lot of these animals end up being in the community wilderness area and therefore they represent the potential richness of Mahenye in wildlife.

Table 6.45: Population estimates of selected species in a stratum in Gonarezhou National Park adjacent to Mahenye Ward

Species	Estimate	Density per km^2	Population
Elephant	1335	1.61	5 175+-40.3%
Buffalo	3156	3.8	4 234+-137.0%
Zebra	78	0.09	662+-50.1%

Source: ART (2002: 8)

The abundance of wildlife in the Mahenye wilderness area was also noted in a group discussion held in the area. All group discussants unanimously indicated that both plant and animal biodiversity in the wilderness area was thriving. The respondents attributed the positive biodiversity trends to the CAMPFIRE project which had instilled some conservation values within the people of Mahenye. One group discussant in Mahenye noted that "*a lot of wild animals are attracted into the Mahenye wilderness area from Gonarezhou National Park by the dense vegetation cover in the community-conserved area*". Although, as shown earlier, a few residents had resorted to poaching due to declining CAMPFIRE benefits, the majority of the Mahenye residents still upheld the conservation values cultivated by the community conservation initiative. All focus group discussants in Chizvirizvi also indicated an abundance and increase in the biodiversity of Malilangwe. The views of the group discussants in Chizvirizvi were succinctly summarised by one of them who noted that

"*there are a lot of rich and famous people who have come from various parts of the world to view the wildlife in Malilangwe. Some of them include Bill Gates and Shakira*". A follow-up on the above claim by the group discussant with the management at Malilangwe proved this to be true.

The increase in the biodiversity of Malilangwe indicated by questionnaire respondents and focus group discussants in Chizvirizvi was confirmed in an interview with the private reserve's ecologist, and was also reflected in various documents unveiled to the researcher by the ecologist. Some of the illustrations on biodiversity trends in Malilangwe contained in these documents are presented below with permission from the management of the conservation area. The ecologist indicated that, after the establishment of Malilangwe, there were reintroductions of some animals which had gone extinct in the area such as the roan antelope. Fifty one roan antelopes were reintroduced from Malawi. The quantities of other wild animals that were in small numbers in the newly established protected area were also boosted. For example, 28 black rhinoceros and 15 white rhinoceros were brought in from South Africa, 30 wildebeest were brought from Zambia, some nyala were brought in from South Africa and Malawi, while sables were also brought in from various parts of Zimbabwe. The total biomass of large mammals in Malilangwe increased steadily from 36kg/ha in 1999 reaching 54 kg/ha in 2012 (Figure 6.1) (Clegg, 2013). The decline in total biomass between 2000 and 2004 was attributed to heavy predation by lions and a major outbreak of anthrax. The steady increase after 2004 was largely due to growth in the buffalo, elephant, hippo and white and black rhino populations, with increases in the zebra, kudu, waterbuck and wildebeest also contributing significantly. The decline in large mammal total biomass to 52 kg/ha in 2013 was the result of the live removal of 700 buffalo as a population control measure (Clegg, 2013).

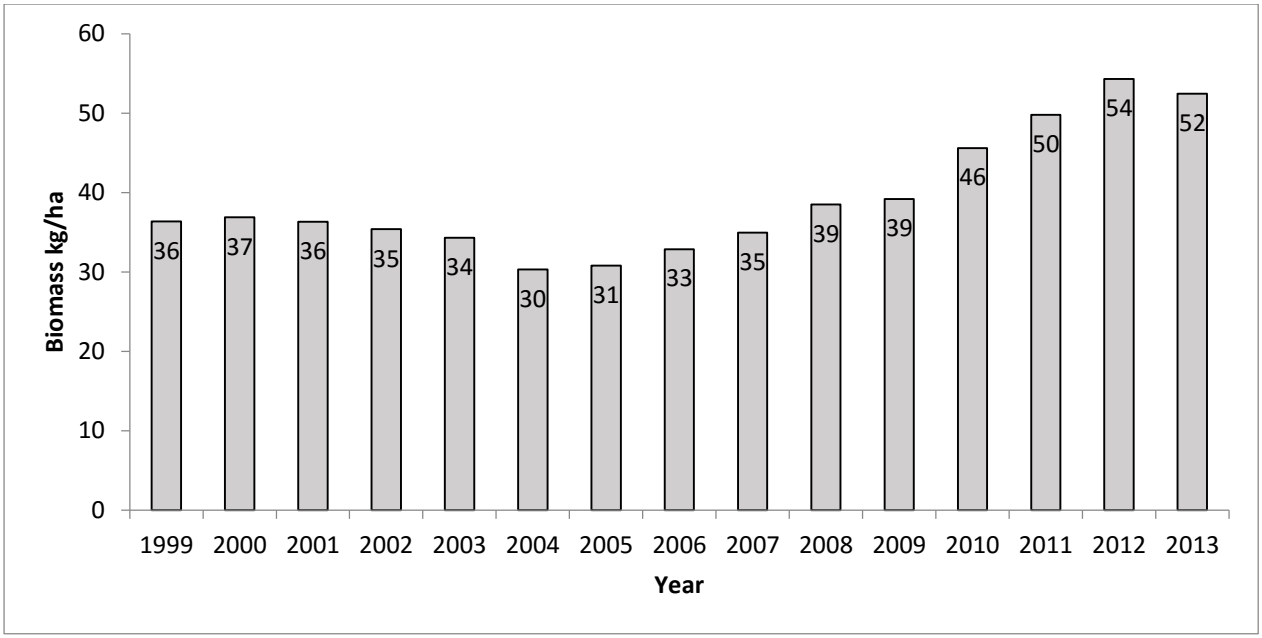

Figure 6.1: Total large mammal biomass (kg/ha) between 1999 and 2013 in Malilangwe Source: Clegg (2013: 21)

Some of the animals that have registered some remarkable population increases since the establishment of Malilangwe include buffalo, elephant, hippo, and impala among others. Some of these animals had to be constantly culled so as to control the growth of their populations. The buffalo population increased rapidly after 2004, reaching a count of 2 472 in 2010 (Figure 6.2) (Clegg, 2013).

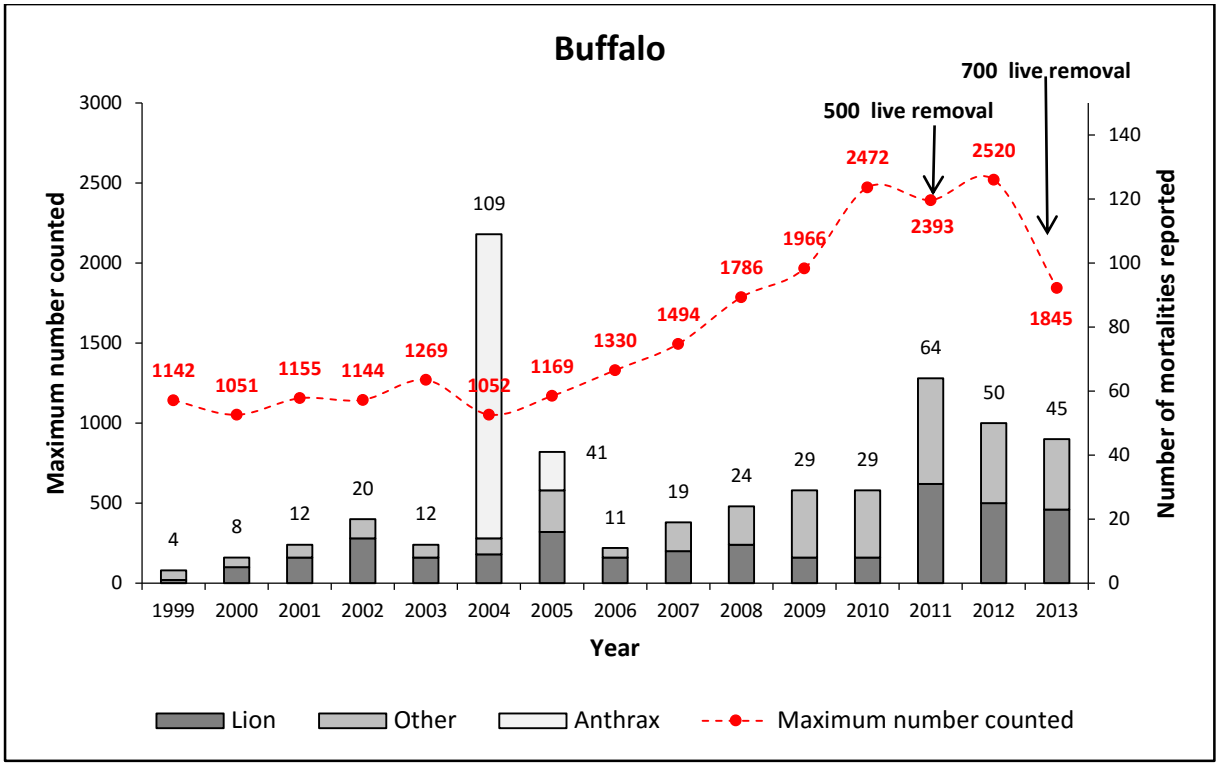

Figure 6.2: The maximum number of buffalo counted and the number of mortalities reported between 1999 and 2013 in Malilangwe
Source: Clegg (2013: 5)

As Figure 6.2 shows, there were a total of 500 live buffalo sales between 2010 and 2011 which reduced numbers to 2393 in 2011. A growth rate of 5.3% per annum increased the buffalo population to 2520 in 2012. A dry spell in the 2012/13 rainy season resulted in a further removal of 700 live animals so as to prevent severe forage shortages, leaving a total of 1845 buffalo. The number of buffalo in Malilangwe is currently estimated to be 2100 (Clegg, 2013).

The elephant population increased steadily at an average rate of 7.7 % per annum from 111 in 1999 to a peak of 197 in 2008 (Figure 6.3) (Clegg, 2013). In a move to control numbers, fifty three elephants were relocated to Bubye Valley Conservancy, lowering the 2009 count to 152. The number of elephants increased again rapidly, reaching a total of 240 in 2012. In 2013 there were a total of 272 elephants counted in Malilangwe (Clegg, 2013).

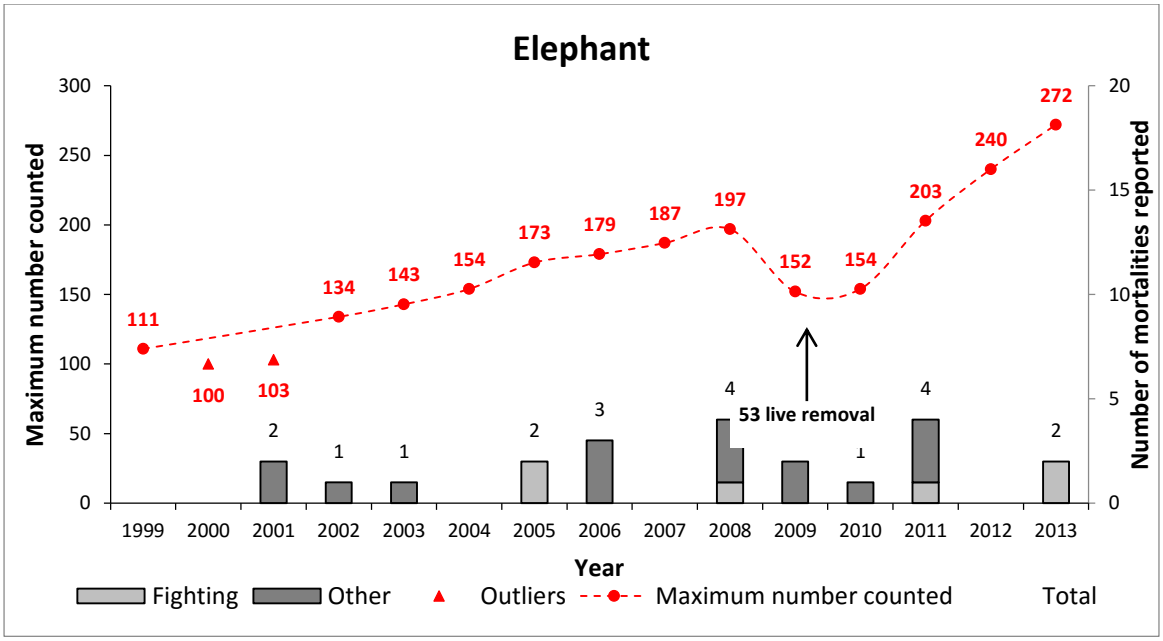

Figure 6.3: The maximum number of elephant counted and removed between 1999 and 2013 in Malilangwe
Source: Clegg (2013: 9)

Using a spreadsheet population model, Clegg (2008) predicted that the Malilangwe elephant population would reach 2686 after 50 years if no intervention was adopted to control its growth (Figure 6.4). If this growth were to be allowed, it would result in the ecological degradation of the protected area. Malilangwe has proposed a control strategy that will ultimately stabilise the population between 150 and 160 individuals (Clegg, 2008).

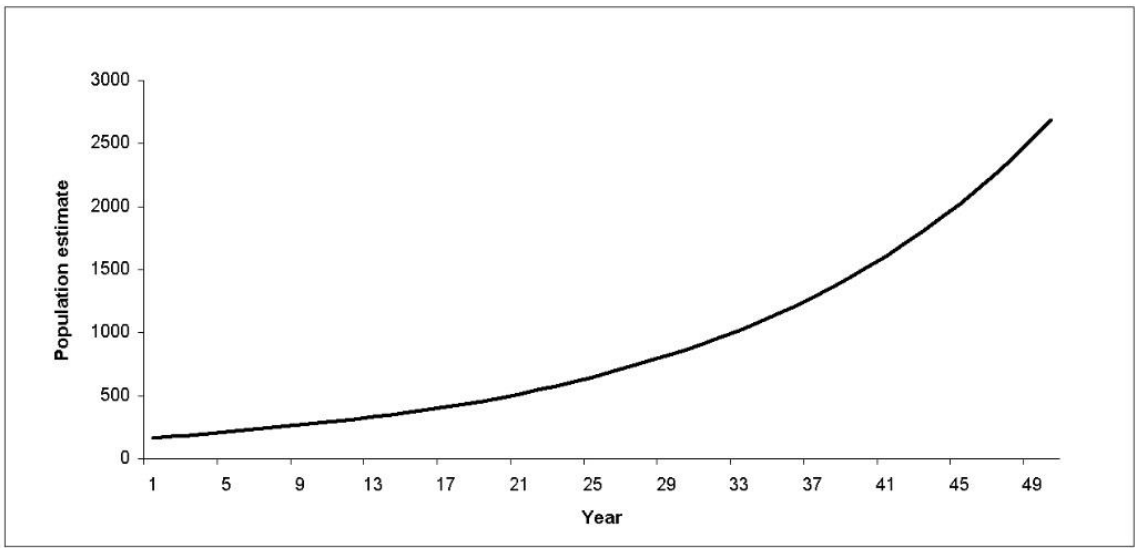

Figure 6.4: Simulated trend in elephant population over a 50 year period in Malilangwe if a zero intervention strategy is adopted
Source: Clegg (2008: 8)

The population of the hippo increased from 24 animals in 1999 to 81 in 2008 (Figure 6.5) (Clegg, 2013). Growth slowed thereafter, with the population stabilising at around 85 by 2010. The population began to increase again reaching 110 in 2013. Other aquatic species in Malilangwe, including fish, crocodiles and frogs, also indicated some healthy population trends.

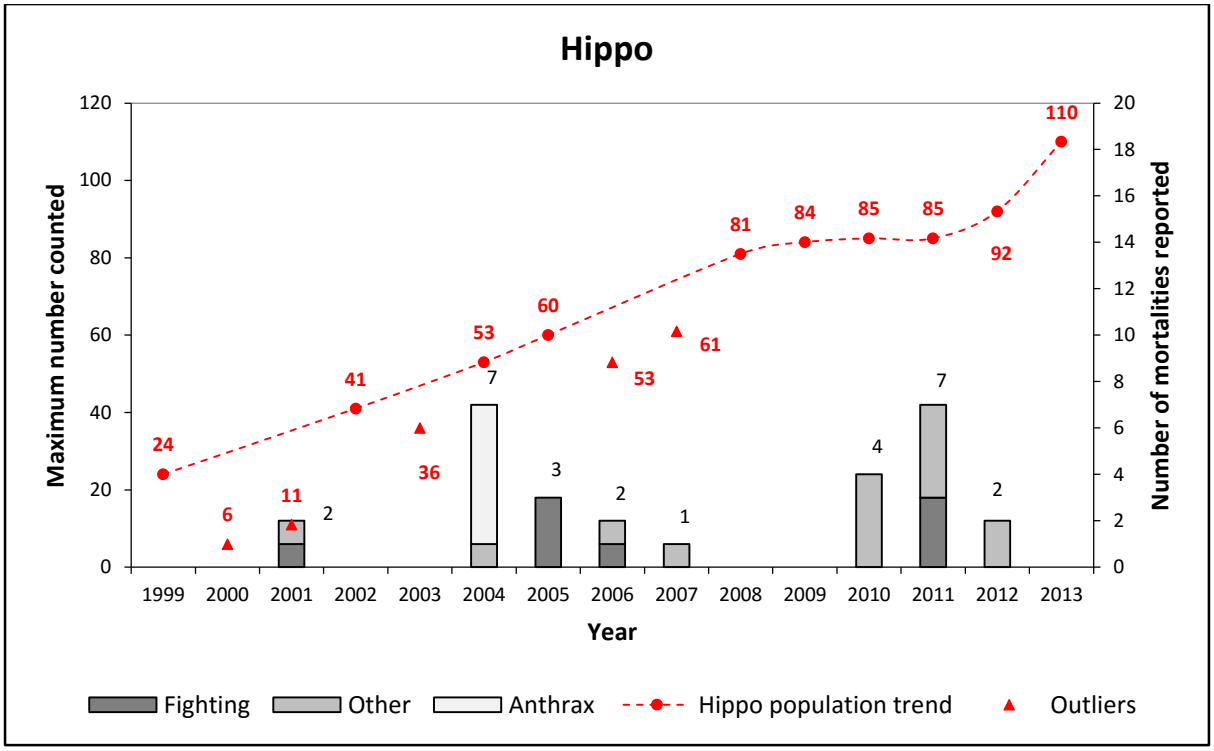

Figure 6.5: Maximum number of hippo counted and the number of mortalities reported between 1999 and 2013 in Malilangwe
Source: Clegg (2013: 12)

The estimated number of impala decreased from 5 717 in 2000 to 4 012 in 2004 (Figure 6.6). The decline in the impala population was however due to increased culling for controlling numbers. Reduced culling after 2004 resulted in a steady increase in the impala population. In 2013 an estimated 6 730 impala were counted, the highest number recorded to date (Clegg, 2013).

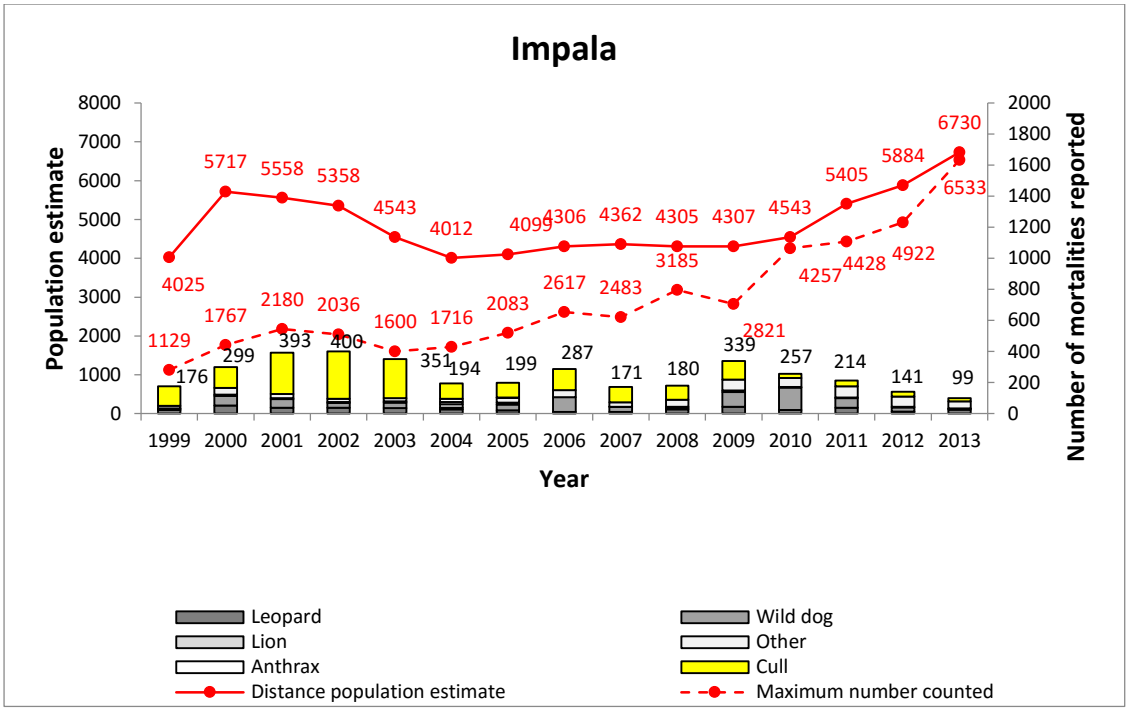

Figure 6.6: Distance estimates for the impala population, the maximum number counted, and the number of mortalities reported between 1999 and 2013 in Malilangwe Source: Clegg (2013: 13)

The ecologist for Malilangwe noted that there were currently about 57 large mammal species, 400 bird species, 36 snake species, 26 species of lizard, 24 species of frogs, and 21 species of fish among various others wildlife species. According to Clegg and O'Connor (2012), estimated densities (number/km^2) for the dominant large herbivore species were: elephant 0.4, white rhino 0.2, black rhino 0.2, giraffe 0.5, buffalo 4.9, eland 0.4, zebra 1.7, wildebeest 0.6, kudu 1.1 and impala 11.2; and these densities have certainly increased since then. The ecologist, however, noted heavy predation, especially by lion and leopard, disease outbreaks (especially anthrax) and droughts as constant threats to the biodiversity of Malilangwe. He further noted that (unlike in the Mahenye wilderness area) poaching was not an issue at Malilangwe due to high security which has come mainly as a result of the erection of the electric fence.

The establishment of the MPWR has also promoted the growth and establishment of floral biodiversity in the conservation area. Clegg (2010b: 1) described the vegetation of Malilangwe as "the capital required to fund the reserve's ecosystem, with degradation of the vegetation resource leading to ecosystem bankruptcy". In fact, the above-noted increases in faunal biodiversity in Malilangwe have only been made possible by a well-established vegetation cover. A comprehensive study by Clegg and O'Connor (2012) recorded 468 plant

species in the MPWR, including a single species of moss, 73 species of grass, 6 species of sedge, 196 species of herbaceous dicotyledon, 6 species of herbaceous monocotyledon, 39 species of shrub, 130 species that grew either as shrubs or trees, and 17 species of woody climber. Varied geological, adaphic and topographical conditions in Malilangwe had promoted the growth and establishment of these various plant species. Destruction by elephants was identified as the main threat to plant biodiversity in Malilangwe. However, a study by Clegg (2010b) on the status of the 4 plant species most favoured by elephants as food, namely, *Commiphora glandulosa*, *Sclerocarya birrea*, *Lannea schweinfurthii*, and *Xerroderis stuhlmannii* (Figure 6.7) showed these species to be very healthy, indicating no serious threat to the vegetation of Malilangwe from elephants. Measures that had been adopted by Malilangwe to promote the development of floral biodiversity included fire management and, as mentioned earlier, the control of animal populations, particularly those of elephants.

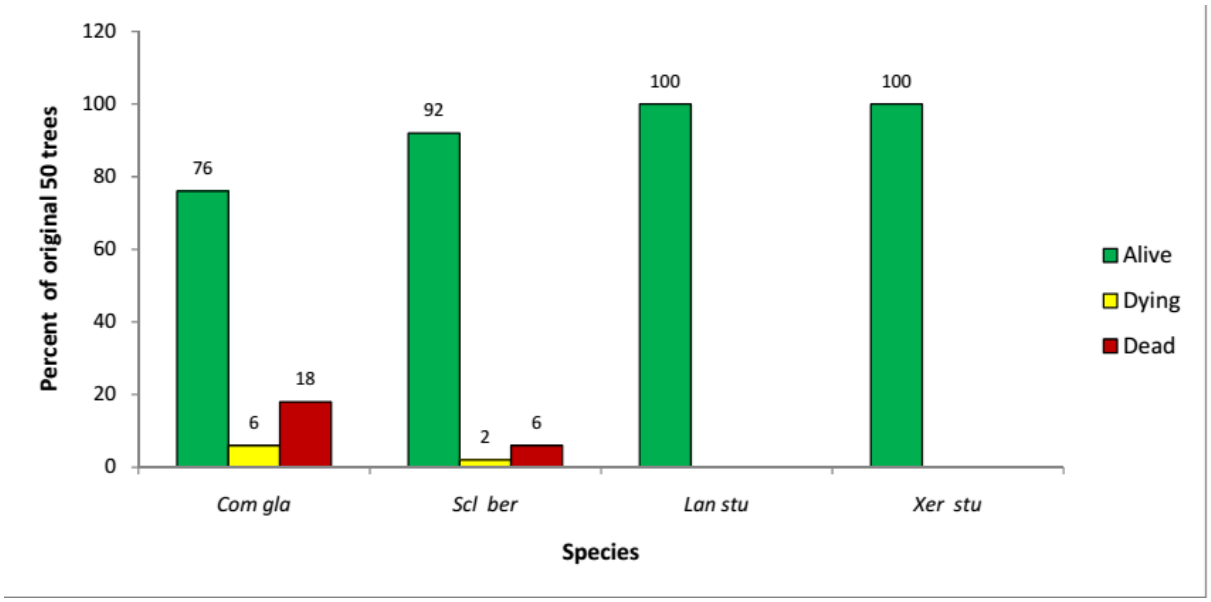

Figure 6.7: The percentage of trees alive, dying and dead for four species most vulnerable to elephant impact in Malilangwe in 2010.
Source: Clegg (2010b: 4)

In spite of some reports of increased poaching in the Mahenye wilderness area since 2000, the biodiversity in the community-conserved area appeared to be quite healthy. The majority of the questionnaire respondents (84.7%) in Mahenye described the biodiversity in the wilderness area as abundant, while various key informants also indicated that the biodiversity in the community conservation area was abundant and increasing. On the other hand, evidence has shown that biodiversity had markedly increased in the MPWR since its

establishment in 1994. Observations during fieldwork also confirmed the abundance of floral and faunal biodiversity in the conservation areas reported by the various respondents. The positive biodiversity trends in the two conservation areas indicate that, contrary to strict protectionism, it is possible to pursue conservation and development goals successfully without compromising the ecological integrity of biodiversity. It is important to note that the reported recent increase in poaching in the Mahenye wilderness area has been spurred by a decline in conservation-related livelihood benefits from the local CAMPFIRE project, which is another proof in support of the need to link conservation and development goals. In this case, it therefore follows that, for there to be more effective biodiversity conservation in Mahenye, the local people must benefit meaningfully from the biodiversity through sustainable use. In Malilangwe, it is important to note that the marrying of conservation and development goals has helped to enhance the social and political legitimacy, and hence existence, of the conservation area. It is worth noting that many private conservation areas in Zimbabwe have been acquired for resettlement in the ongoing land reform programme, with those conservation areas supporting development activities in surrounding communities, such as Malilangwe, more likely to be spared. Literature evidence indicates that conservation areas cannot survive if they do not meaningfully contribute to the well-being of poor adjacent communities (Scherl et al, 2004; Wolmer et al, 2004).

6.7 Conclusion

This chapter presented the analysis and discussion of the results collected from various respondents from protected areas and local communities under study, as well as from secondary data sources. The focus was on the impacts, both positive and negative, of the protected areas on the livelihoods of the people in the selected local communities. There were similarities as well as differences in the impacts of the protected areas on the livelihoods of the local communities. The findings revealed an overall decline in livelihood benefits from the conservation areas to local communities, since 2000, due to deteriorating socio-economic and political conditions in the country. Various other hindrances to the flow of livelihood benefits from conservation areas to communities have also been identified. The need to enhance community livelihood benefits from conservation areas to local communities, while maintaining the ecological integrity of the protected areas, was a common concern expressed by most respondents.

CHAPTER SEVEN: SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

7.1 Introduction

This study has looked at two conservation areas in Zimbabwe, namely, Mahenye (a community-based natural resource management area integrating conservation with community development goals) and Malilangwe (a private wildlife reserve also pursuing conservation accompanied with community outreach activities). The main aim of the study was to compare the two conservation areas in terms of their positive and negative livelihood impacts on local communities. The adjacent Chizvirizvi community was selected as a case study site for assessing the impacts of MPWR on local communities while, for Mahenye, a community-conserved area, its livelihood impacts were confined to the same community. This chapter presents the key findings of the research and, based on these findings, also suggests some recommendations for enhancing conservation-livelihood outcomes in the study areas.

7.2 Summary of key findings

This section presents a summary of the key findings of the study in relation to the study objectives, the aim being to address the research questions. There were both similarities and differences in the observed livelihood impacts of the Mahenye community conservation initiative and the MPWR on the Mahenye and Chizvirizvi communities, respectively.

7.2.1 Objective One: Demographic and socio-economic characteristics of local communities and current and desired livelihood strategies and levels of socio-economic development

The main focus of this objective was to establish the current and desired livelihood strategies and levels of socio-economic development in the selected local communities interacting with the conservation areas. All the questionnaire respondents in Mahenye and Chizvirizvi cited farming as their main livelihood occupation. Twenty eight percent of the respondents in Mahenye indicated that they practised subsistence crop production while the remainder (72%) practised subsistence crop and livestock production. All the respondents in Chizvirizvi indicated that they practised subsistence crop and livestock production. However, some respondents, particularly in Chizvirizvi, noted that they also occasionally produced surplus for sale during good seasons.

The sizes of landholdings in Mahenye and Chizvirizvi differed markedly. The average landholding size in Mahenye was 2.3 ha while in Chizvirizvi it was 74.9 ha. The disparity in land size was due to the fact that Mahenye is a communal area while Chizvirizvi is a resettlement area. The findings compare with a survey conducted in 1989 which indicated that 70% of communal households in Zimbabwe had access to only 2.5 ha of arable land with the remaining 30% having less than 1.5 ha (Chenje et al, 1998). Though the main aim of the resettlement programme in post-independence Zimbabwe was to relieve population pressure in the communal areas, the results of this study prove that this has not yet been achieved in Mahenye and, most probably, the majority of the communal areas of the country. Residents of both Mahenye and Chizvirizvi did not have title to the land they occupied with those in the former only having usufructory rights to land, while those in the latter farmed the land on leasehold. Ownership of land in communal and resettlement areas in Zimbabwe is vested in the state. It is often argued that the communal and leasehold tenure systems, compared to freehold tenure, are a disincentive to long-term investment in the conservation and improvement of the natural resource base (Government of Zimbabwe, 1998; Megersa et al, 2014).

The majority of the respondents in both study areas owned various types of livestock, with cattle being the most commonly owned livestock in both communities. There were more households owning livestock in Chizvirizvi than in Mahenye. Sixty five percent of the respondents in Mahenye and 96% of the respondents in Chizvirizvi owned cattle. The average number of cattle owned by cattle-owning households was 11 in Mahenye and 11.8 in Chizvirizvi, while the maximum number of cattle owned by a single household in Mahenye and Chizvirizvi was 52 and 72, respectively. A study by Scoones and Wilson (1989) indicated that the multiple functions of cattle have made them a popular livestock among many communal and resettlement farmers in Zimbabwe. Studies in East Africa by Tsegaye et al (2013) revealed that many communities also survived by keeping multispecies of livestock. Livestock rearing, particular cattle production, has, however, since been cited as a major cause of land degradation in Zimbabwe and elsewhere, especially in the communal areas, with farmers keeping relatively large herds without regard to carrying capacities due to the livelihood significance of livestock among these communities (Megersa et al, 2014; Scoones and Wilson, 1989; Stocking, 1980). However, there were no indications of land degradation due to overgrazing in both study areas.

Residents of Mahenye and Chizvirizvi identified various challenges to farming. In Mahenye, 64% of the respondents cited lack of resources, 95% cited destruction of crops by wild animals while 87.3% indicated aridity as major challenges to farming. Major challenges to farming in Chizvirizvi included lack of resources (58.7%), lack of farming skills and resources combined (41.3%) and aridity (99.3%). The above challenges have restricted most households in these communities to subsistence farming, which has in turn made the majority of the residents in both study areas dependent on natural resources for livelihoods.

Ninety eight percent of the respondents in Mahenye and all respondents in Chizvirizvi indicated that they desired to engage in an alternative main livelihood occupation besides the current one of subsistence farming. The three most desired alternatives to subsistence farming in the two study areas were commercial farming, running of a business and professional employment. This indicates dissatisfaction with subsistence farming as the main livelihood occupation among the residents of the two communities. However, lack of skills and resources were cited as the main hindrances to engaging in the desired alternative economic activities. It was noted that the desired livelihood strategies, especially commercial farming and business activities, are likely to place increased demands on biodiversity areas for land clearing or natural resource extraction purposes.

Residents of Mahenye and Chizvirizvi indicated various sources of household income, with farming being the main income source in both areas. There were fewer households with a single income source while the majority of households had three income sources. The findings compare with similar studies in Zimbabwe such as the one by Stack and Sukume (2006) who indicated that rural households in Zimbabwe rely on various sources of income for survival. Mahenye and Chizvirizvi residents had low average monthly household incomes of US$72.7 and US$75.1, respectively, which, when divided by the high average household sizes in these areas, resulted in per capita daily incomes of less than US$1. In addition, 77.4% of the respondents in Mahenye and 71.4% of the respondents in Chizvirizvi rated their household poverty levels between high and very high. These findings are in tandem with the First and Second PASs conducted in 1995 and 2003 which indicated high poverty levels in the rural areas of Zimbabwe compared to urban areas. Poverty has been identified as one of the major drivers of environmental degradation as the poor, in search of means to sustain themselves, often engage in activities that damage the environment (Holden et al, 2014; Roe and Elliot, 2005; Vira and Kontoleon, 2010).

The study has also revealed a high dependency on natural resources by households in Mahenye and Chizvirizvi, which reflects the high poverty levels in these communities. Eighty five percent of the respondents in Mahenye and 97.4% of the respondents in Chizvirizvi rated their reliance on natural resources for livelihoods as very strong and strong. The results compare with similar studies (Cavendish, 2000; FAO, 2001) which indicate that the majority of rural households in Zimbabwe depend on natural resources for their livelihoods and income generation due to poverty. Studies elsewhere (Hogarth et al, 2013; Mohammed et al, 2014; Ranjitkar et al, 2014; Zenteno et al, 2013) have also documented the significance of forest products to livelihoods and well-being among rural households. The high dependence on natural resources for livelihoods in both study areas, coupled with the large average household sizes in these communities, pose a threat to biodiversity conservation, highlighting the need to develop alternative livelihood sources and focus on sustainable utilisation of natural resources in the areas.

Most respondents in Mahenye and Chizvirizvi expressed dissatisfaction with the quality of various social services within their communities. Such services included water supply, health, education, transport and shops, among others. In addition, the majority of the respondents in both study areas indicated a high development priority for almost all of these services. Other indicators of low levels of socio-economic development in Mahenye and Chizvirizvi included a high dependence on biomass, particularly fuelwood, for energy needs and a high number of households with no toilet facilities. Thirty nine percent of households in Mahenye had no toilet facilities while 57.3% of households in Chizvirizvi also did not have toilet facilities. In addition, 81% of households in Mahenye and 31.3% of households in Chizvirizvi had pole and dagga huts as dwellings. While all residents of Mahenye had access to borehole water, 74% of households in Chizvirizvi relied on wells as their main water source. The results indicate low levels of socio-economic development and a high dependence on natural resources for livelihoods in both Mahenye and Chizvirizvi. These findings echo literature evidence indicating the general failure of post-independence efforts towards rural development in Zimbabwe (Bond, 1999; Hurungo, 2007; UNDP, 2010). The results also confirm literature evidence indicating an overlap between poverty and protected areas (Gurney et al, 2014; Meilby et al, 2014; Romero et al, 2012; Turner et al, 2012), which highlights the need for protected areas to help in meeting the livelihood needs of poor communities often coexisting with them.

7.2.2 Objective Two: Benefits to local communities from conservation areas

The focus of this objective was to examine the livelihood benefits from the conservation areas to the local communities as the conservation areas were pursuing conservation linked with livelihoods objectives. Various livelihood benefits from the Mahenye community-based conservation initiative and MPWR to the Mahenye and Chizvirizvi communities, respectively, were identified.

One of the livelihood benefits from the conservation areas to the communities was that of income enhancement at both the community and household levels. The sustainable livelihoods framework identifies financial capital as one of the key livelihood assets (Bennett and Dearden, 2014; Carney, 1998; Chambers and Conway, 1992; Ferrol-Schulte et al, 2013; Fisher et al, 2013; Fisher et al, 2005; Scoones, 1998). In Mahenye, CAMPFIRE has generated income at the community level through sport hunting and ecotourism activities. The Mahenye community receives 55% of gross sport hunting revenue from hunting activities conducted in the community's 15 000 ha wilderness area while 41% goes to Chipinge Rural District Council and 4% goes to the CA. An ecotouristic lodge in Mahenye, Chilo Lodge, also disburses 10% of annual profits to the Mahenye community. Other sources of community income in Mahenye included a shop, a grinding mill, rentals from buildings, and a truck. All these community investments had been made with CAMPFIRE revenue obtained through sport hunting and ecotourism. There was no income enhancement at community level in Chizvirizvi from Malilangwe.

Income enhancement at the household level occurred in both Mahenye and Chizvirizvi from the conservation areas. One of the ways in which CAMPFIRE has enhanced income at the household level in Mahenye has been through household cash dividends. These dividends, amounting to between US$10 and US$30 per annum, have, however, only been supplementary to crop and livestock production as they were not enough to act as alternative or stand-alone livelihood options to farming (Balint and Mashinya, 2006; Bond, 1999; Mashinya, 2007). Payment of household dividends has, however, ceased due to declining CAMPFIRE revenue, with the last dividends paid out in 2004.

Both CAMPFIRE and Malilangwe have enhanced household income in Mahenye and Chizvirizvi through employment creation. CAMPFIRE has generated a total of 52 jobs in Mahenye mainly for the local people, with Chilo Lodge, Zambezi Hunters and the CAMPFIRE project itself employing local people in various capacities. With a workforce of

320 employees, Malilangwe has also created jobs for some of the people in Chizvirizvi. However, unlike CAMPFIRE which mainly employs the people of Mahenye, Malilangwe employs people from all over the country and not just the communities bordering it like Chizvirizvi. Most of the jobs that have been created for the local people by the conservation areas were, however, mostly low-skill and therefore lowly-paid jobs as locals do not have higher educational qualifications to take up higher-paying jobs. The average salary for workers in conservation employment in Mahenye and Chizvirizvi was US$191 and US$258, respectively. The findings confirm literature evidence indicating that most local people employed by conservation areas take up jobs requiring low skills due to their low educational status (Borgerhoff Mulder and Coppolillo, 2005; Leisher et al, 2010).

The conservation areas have also enhanced household incomes in Mahenye and Chizvirizvi through the stimulation of business opportunities, with the selling of crafts to visiting tourists being cited by most of the respondents in both study areas as the main business activity stimulated. Some cultural dance groups are also hired to perform for tourists at Chilo Lodge and Malilangwe, earning the members of these groups income for their households.

Malilangwe has also indirectly enhanced household incomes in Chizvirizvi by funding the establishment of the large self-contained plots now occupied by the people in the area. Interviewed residents indicated that they sometimes produce surplus for sale during good seasons. In addition, Malilangwe started a gardening project in Chizvirizvi, with beneficiaries selling some of their produce for income. However, the gardening project was on the verge of collapse at the time of fieldwork, with only one garden left running at the Chief's homestead. Lack of borehole maintenance was the main reason for the collapse of the gardening project. One of the reasons often cited for the failure of most community development projects is lack of follow-up and maintenance (Borgerhoff Mulder and Coppolillo, 2005).

The conservation areas have also contributed to the improvement of education in the local communities. The sustainable livelihoods framework identifies human capital as another key asset for the successful pursuit of various livelihoods, with knowledge and skills identified as constituent elements of this form of capital (Bennett and Dearden, 2014; Chambers and Conway, 1992; Ferrol-Schulte et al, 2013; Fisher et al, 2013; Scoones, 1998). The Mahenye CAMPFIRE project has constructed two school blocks at Mahenye Primary School and another block at Mahenye Secondary School, in addition to the construction of a house for teachers at the secondary school. Malilangwe has refurbished all the school blocks at Mwenje

and Benzi Primary Schools in Chizvirizvi. Malilangwe has also connected Mwenje Primary and Dumisani Secondary Schools to the national electricity grid, in addition to making various donations to these schools. Both Malilangwe and the CAMPFIRE project had also funded the education of some pupils at the local schools, with the former sponsoring the education of some students at the country's tertiary institutions. The conservation areas had, however, stopped the financial support to students citing cash constraints.

According to the sustainable livelihoods framework, the ability of humans to successfully pursue various livelihoods activities is precariously dependent upon their health and well-being (Chambers and Conway, 1992; Ferrol-Schulte et al, 2013; Fisher et al, 2005; Scoones, 1998). In light of the above, the conservation areas have also contributed to the health of the local communities in various ways. Some of the health contributions of Malilangwe to Chizvirizvi included the construction of Chizvirizvi Clinic and a waiting mothers' shelter, the on-going MCSFS, HIV/AIDS awareness raising, malaria control through the distribution of mosquito nets and various other activities. The CAMPFIRE project has connected Mahenye Clinic to the national electricity grid, in addition to extending piped water supply and a telephone line from Chilo Lodge. CAMPFIRE has also constructed some toilets at Mahenye Clinic.

The study has shown that the residents of both Mahenye and Chizvirizvi rely heavily on natural resources for livelihoods. The conservation areas have promoted the sustainable utilisation of natural resources in these areas by creating environmental awareness. Both the SLA and the MEA, and various other researchers, recognise the centrality of natural resources to the livelihoods of many poor rural households in developing countries (MEA, 2005a; Sangeethapriya and Siddhuraju, 2014; Scho¨nfeldt and Pretorius, 2011; Scoones, 1998; Shumsky et al, 2014; Sukara, 2014; Uusiku et al, 2010).

The majority of the respondents in Mahenye (77.3%) and Chizvirizvi (89.3%) indicated that the livelihood benefits from the conservation areas were a tool for community development in their areas. However, of these, only 19.8% in Mahenye and 26.9% in Chizvirizvi said that these benefits had brought adequate development to their areas, with most respondents in both communities indicating the need for the conservation areas to fund irrigation development and livestock rearing, in addition to infrastructural development, for there to be adequate development in their areas. Those respondents in Mahenye and Chizvirizvi who said that the conservation benefits were not a tool for socio-economic development also

indicated that the conservation areas should help with irrigation development, livestock rearing and infrastructural development for them to meaningfully bring development to their areas. This highlights the earlier identified centrality of agriculture to the livelihoods of households in both Mahenye and Chizvirizvi.

7.2.3 Objective Three: Hindrances to livelihood benefits from conservation areas

The aim of this objective was to identify hindrances to the flow of livelihood benefits from the conservation areas to the communities. The political ecological framework identifies local and non-local factors and actors at play in the control of natural resources or benefits derived from them (Borgerhoff Mulder and Coppolillo, 2005; Neumann, 1998; Vayda and Walters, 1999; Wilshusen, 2003). Two categories of hindrances were identified in this study: those emanating from within the communities and those external to the communities.

One of the main external hindrances to the flow of conservation benefits in Mahenye resulted from the incomplete devolution of appropriate authority to manage wildlife areas and accrue benefits, which has seen appropriate authority being vested in RDCs by government, instead of sub-district structures such as villages and wards. This has allowed RDCs to retain 41% of gross CAMPFIRE revenue from sport hunting as tax, with local communities involved in CAMPFIRE, such as Mahenye, receiving only 55% of gross trophy hunting revenue. In addition, Mahenye shares the revenue from trophy hunting with Mutandahwe ward with which it currently jointly owns the hunting concession. Similar studies in Mahenye (Mashinya, 2007; Rihoy et al, 2010) have also identified lack of complete devolution as a major impediment to the accruing of benefits to the community from CAMPFIRE. The findings are also a reflection of the general literature on devolution (Brockington et al, 2008; Nelson, 2010; Ribot, 2004) indicating that there has just been more publicity than the implementation of the concept. On the other hand, RDCs view the levies from wildlife management as an important source of income as they no longer receive substantial funding from central government (Rihoy and Maguranyanga, 2007).

Lack of appropriate authority for the management of wildlife has also meant that the Mahenye community has no control over the selection of the hunter or over the size of the annual hunting quota. Most residents of Mahenye interviewed felt that the area could support a larger annual hunting quota of between 8-10 elephants instead of the 4-5 elephants allowed by the PWLMA. In addition to a low hunting quota, the hunters in Mahenye have often failed to fully utilise their quotas, thereby resulting in lower CAMPFIRE revenue.

Another external hindrance to the flow of livelihood benefits from conservation areas identified by respondents in both Mahenye and Chizvirizvi emanated from the political and economic crisis the country is currently experiencing since 2000. This has been followed by a decline in international tourist arrivals which has negatively impacted ecotourism activities in both Mahenye and Malilangwe. Considering the fact that ecotourism is one of the main income earners for the Mahenye CAMPFIRE project and MPWR, the conservation areas have in turn either completely stopped or downsized some of their community development activities in Mahenye and Chizvirizvi. For example, the CAMPFIRE project has stopped paying out household cash dividends and bursaries to school pupils in Mahenye, while Malilangwe has also stopped funding student education, in addition to downsizing its child supplementary feeding scheme. The findings confirm literature evidence indicating the sensitivity of tourism to adverse political and economic developments (Borgerhoff Mulder and Coppolillo, 2005; Duffy, 2000; Jalani, 2012; Leisher et al, 2010; Youdelis, 2013). Though sport hunting in Mahenye has shown some resilience in the face of the negative political developments in the country, the recently announced ban on sport-hunted trophies from Zimbabwe by the USFWS is likely to have an effect as most trophy hunting clients for the country came from the USA.

Another external hindrance to the flow of benefits from Malilangwe to Chizvirizvi was the non-involvement of the local community by the conservation area in the identification of community development needs. Residents of Chizvirizvi felt that the impact of the development initiatives in their community by Malilangwe could further be enhanced if the conservation area consulted them during planning. In light of the above, residents of Chizvirizvi noted that, instead of refurbishing the two primary schools in their community, Malilangwe could have used the money to construct another secondary school, which could have offset the secondary school shortage in the area. The findings are in tandem with conservation-development literature identifying lack of community involvement as a major impediment to the success of initiatives combining conservation with livelihood goals (Buta et al, 2014; Wilshusen et al, 2003). In addition, some residents of Chizvirizvi alleged that Malilangwe was using the community development card so as to attract donor funding for own use, an allegation denied by the conservation area's management. Though such an allegation was difficult to prove, it echoes sentiments by Wolmer et al (2004) who note that some private conservancies in Zimbabwe were embarking on community outreach activities primarily for attracting donor funding.

Chief among the internal hindrances to the flow of conservation benefits in Mahenye was the increasing lack of transparency and accountability by successive elected CAMPFIRE Committees, especially after 2000. Evidence from audit reports of the Mahenye CAMPFIRE project by Chipinge Rural District Council and also from community respondents pointed to the misappropriation of funds by members of various CAMPFIRE Committees, and more particularly by the chairpersons who appeared to single-handedly manage the finances of the community project. The lack of transparency in the handling of funds was also evident in the running of CAMPFIRE projects such as the grinding mill, the shop and the truck. In addition, community respondents complained that CAMPFIRE committee members continued to award themselves huge sitting allowances while all other community members no longer received household dividends. Studies on community conservation initiatives have noted an inability by most local people to manage and administer revenues from natural resources, with the elites often trying their best to gain a disproportionate share of the benefits from biodiversity projects due to poverty and decades of marginalisation (Fabricius, 2004). The demise of institutional capacity in CAMPFIRE has mainly been a result of the marginalisation of the civil organisations, particularly ZIMTRUST, that were involved in capacity building at grassroots level (Rihoy et al, 2010).

In addition, residents of Mahenye noted that CAMPFIRE committees were increasingly making decisions without first consulting the community. A case in point was the construction of the new offices for resource monitors and the accounts clerk, where the community was not consulted. Some residents indicated that this was partly being caused by the fact that general meetings were held only once at the end of the year, which had reduced interaction between the CAMPFIRE leadership and the community. The residents felt that there should be more meetings so as to enhance interaction and joint analysis and action between project committees and the community.

Another internal hindrance to the flow of conservation benefits to the Mahenye community was due to the undue influence of the traditional leadership on the CAMPFIRE project. The Chief was extremely influential in the election of CAMPFIRE chairpersons and committee members, which has destroyed democratic procedures for the transparent election of the CAMPFIRE leadership in Mahenye. The Chief's relatives and allies were also reported to be filling up most of the employment opportunities that have been created by the CAMPFIRE project. It was also observed that the Chief was now operating the other half of the CAMPFIRE shop for his own benefit. The Chief, who was not a CAMPFIRE committee

member, was also receiving a monthly allowance of US$40, which further highlights his influence on the community project. The CAMPFIRE clerk also indicated that, sometimes, the chief asks for money from CAMPFIRE for his personal travels, for beer drinking and for sponsoring ZANU PF meetings in Mahenye. The findings of this study compare with those by Mashinya (2007) and also Rihoy et al (2010) in the same area who have also identified the influence of the traditional leadership as a major impediment to the community natural resource management project.

The above institutional limitations of CAMPFIRE in Mahenye, particularly lack of transparency by CAMPFIRE committees and undue influence by the chieftaincy, raise some scepticism on the possibility for the complete devolution of appropriate authority for the management of wildlife and associated benefits to the community level at present. This is because such a move might simply mean more funds for misappropriation by a few powerful individuals. Measures therefore need to be taken so as to strengthen institutional capacity in the area before complete devolution can finally be done.

Female respondents in Mahenye also expressed displeasure at their marginalisation in benefiting from the CAMPFIRE project. Of particular concern was the fact that most of the jobs that had been generated by the CAMPFIRE project had mostly been filled by men, with very few women having been hired. The findings confirm literature evidence highlighting the general marginalisation of women, and female-headed households in particular, from conservation-related benefits due to patriarchy (Leisher et al, 2010).

There were few internal hindrances to the flow of conservation benefits in Chizvirizvi as most of the community development projects were being run directly by Malilangwe. However, there were reports that the chief of the area was now controlling the only remaining garden in Chizvirizvi. Allegations were that one had to pay the chief for them to get a portion of the community garden. Some respondents also alleged that for one to get a job in Malilangwe, they had to get recommendation from the chief or from friends and relatives already working in the conservation area which, if true, marginalises those residents not acquainted with the chief or without colleagues already employed by the protected area.

7.2.4 Objective Four: Costs to local communities from conservation areas

The aim of this objective was to examine livelihood costs to local communities from the conservation areas. Various livelihood costs were identified.

The majority of the questionnaire respondents in Mahenye (54.7%) and Chizvirizvi (98%) indicated that the conservation areas had curtailed their access to resources they had traditionally used in the past. The majority of the respondents in Mahenye (83.3%) and 70% of the respondents in Chizvirizvi indicated that the conservation areas had led to loss of land and livelihoods. In addition, 11.3% of the respondents in Mahenye noted that they could not expand their agricultural land due to the presence of the protected area in their community. Both Malilangwe and the Mahenye wilderness area were established in areas that had previously been inhabited by the people of Chizvirizvi and Mahenye, respectively. Conservation literature notes that most adjacent communities historically predate protected areas, have pre-existing rights to resources in them and have often been adversely affected by their designation (Buta et al, 2014). When asked whether they required access into the protected areas for various resources or activities, the majority of questionnaire respondents in Mahenye and fewer respondents in Chizvirizvi (Table 6.38) indicated that they required access. However, no one was allowed access into the strictly protected conservation areas. A total of 31.3% of the respondents in Mahenye admitted that they sometimes illegally collected resources from the wilderness area, with most of them indicating that they started doing so after 2000 due to dwindling CAMPFIRE benefits to the community. The findings are comparable to those by Gandiwa et al (2013) who noted an increase in illegal hunting in the northern Gonarezhou National Park from adjacent communities following political instability and economic decline in the country since 2000. This highlights the need for restoring lost livelihood benefits from CAMPFIRE in Mahenye if sustainable development is to be realised. Residents of Chizvirizvi indicated that it was impossible for them to poach for resources in Malilangwe due to heavy security.

Another livelihood cost from the conservation areas to the communities was the destruction of crops by wild animals. All questionnaire respondents in Mahenye and 30.7% of the respondents in Chizvirizvi indicated that their crops were frequently destroyed by wild animals from the conservation areas. The situation was not as severe in Chizvirizvi due to the electric fence around Malilangwe which prevented wild animals from escaping. However, quelea birds were the main threat to crops in Chizvirizvi from Malilangwe. The birds frequented fields for small-grained crops such as sorghum, millet and rapoko. Crop destruction by wild animals was more severe in Mahenye as the wilderness area was not fenced. The main problem animals identified by the residents of Mahenye included elephants, baboons, monkeys, bush pigs, bush bucks, hippos and porcupines. The destruction of crops

by wildlife in the two communities represents a major livelihood cost as farming has been identified as the main livelihood occupation in these areas. This further reduces already low crop yields thereby exacerbating poverty and food insecurity in the study areas. Studies from elsewhere in the world (Agarwala et al, 2010; Bulte and Rondeau, 2007; Liu et al, 2010) have also identified crop destruction by wildlife as a major challenge for communities living at the periphery of protected areas.

In addition to the destruction of crops, all questionnaire respondents in Mahenye and 15.3% of the respondents in Chizvirizvi indicated that wildlife was also harassing people in these areas. At least 8 people were reported to have been killed by wildlife since the start of the CAMPFIRE project in 1990, while several others had sustained injuries. Though there were no reported cases of human deaths or injuries due to wildlife attacks in Chizvirizvi, school authorities indicated that some pupils would sometimes not come to school fearing attacks by wild animals that would have been spotted in the area.

Competition for water and grazing in the dry season between wildlife and livestock was identified as another cost from the conservation area by 48% of questionnaire respondents in Mahenye. Mahenye residents also noted that the constant mixing of wildlife with livestock had the potential to transmit diseases such as anthrax and foot and mouth to their livestock. There were two suspected cases of foot and mouth in Mahenye in 2012. In addition, there were reports of livestock being devoured by wild animals such as lions, leopards, crocodiles and hyenas in Mahenye. The study results correspond with those in other parts of the world. For example, destruction of livestock by the Asiatic black bear has been documented in many countries including Japan, India, Nepal and Bhutan (Liu et al, 2011), while Muhly and Musiani (2009) have also documented livestock predation by wolves in the north-western USA. Studies by de Garine-Wichatitsky et al (2013) in communities adjacent to transfrontier conservation areas in Zimbabwe identified various livestock diseases that are contracted from wildlife including foot and mouth, black leg, anthrax, rabies and heartwater, among others. Losses of livestock due to carnivores and diseases transmitted from wildlife can be particularly damaging on communal lands where livestock production is an important economic activity (Maclennan et al, 2009; Muhly and Musiani, 2009). There were no reports of disease transmission from wildlife to livestock or the devouring of livestock by wildlife in Chizvirizvi due to the electric fence which prevented wild animals from escaping into surrounding communities.

Interviews in Mahenye revealed that residents were not receiving any compensation from CAMPFIRE for the destruction of their crops and livestock by wildlife or for the injuries or deaths of people due to attacks by wild animals. The CAMPFIRE Chairperson indicated that a comprehensive compensation plan for losses incurred from wildlife was yet to be devised. Residents of Chizvirizvi also indicated that they were not receiving any compensation from Malilangwe for the losses they were incurring due to quelea birds. The human-wildlife conflicts in Mahenye have been worsened by ineffective PAC due to poorly equipped resource monitors. While Chipinge Rural District Council retains 26% of sport hunting revenue for wildlife management activities, the money is not serving its intended purpose. Lack of compensation for wildlife-induced livelihood costs has exacerbated the impacts of these costs among the affected residents of Mahenye and Chizvirizvi. Research has, however, shown that compensation for wildlife damages can be relatively cheap to implement in poverty-stricken areas and is readily accepted by local communities, and can act as an incentive for communities bordering protected areas to tolerate wildlife (Bulte and Rondeau, 2007). Agarwala et al (2010: 2945) further note that "paying for wildlife damage can ostensibly engender local support for conservation, reduce incentives for retaliatory action and buy time for alternative management practices".

Respondents in both Mahenye and Chizvirizvi also noted that they were being side-lined by other rural development agencies, with these development organisations arguing that these communities were already getting enough development assistance from CAMPFIRE and Malilangwe, respectively. Residents of Mahenye and Chizvirizvi, however, lamented that they were being disadvantaged as they were not getting adequate development assistance from the conservation areas.

7.2.5 Objective Five: The state of biodiversity in conservation areas

The study also sought to examine the state of biodiversity in the conservation areas. Evidence from community respondents, conservation area officials, secondary data and field observations indicated healthy biodiversity trends in both the Mahenye wilderness area and the MPWR.

In Malilangwe, both floral and faunal components of biodiversity had significantly increased since the establishment of the conservation area in 1994. Some animal species such as the roan antelope which had gone extinct in the area were reintroduced, while the numbers of various other species were also boosted. Several animal species such as buffalo, elephant,

impala and nyala, among others, have to be constantly culled so as to avoid population overshoots beyond the reserve's carrying capacity. The current elephant population of 272 was actually above the recommended number of between 150 and 160 elephants for the reserve and measures were being taken to control their population. A simulation model predicted that the population of elephants in Malilangwe would exceed 2 600 in 50 years if no population control measures were taken. The aquatic biodiversity of Malilangwe (including fish, hippos, crocodiles and frogs) also showed healthy trends. A comprehensive study by Clegg and O'Connor (2012) recorded 468 plant species in the MPWR. While destruction by elephants was identified as the main threat to plant biodiversity in Malilangwe, research by Clegg (2010b) on the status of the 4 plant species most vulnerable to elephant impact showed these species to be very healthy, indicating no immediate threat to the vegetation of Malilangwe from elephants. Malilangwe had also instituted fire management, in addition to wildlife population controls, as strategies for vegetation protection in the conservation area.

In spite of reports of increased poaching activities following the economic decline in the country which had reduced the benefits of CAMPFIRE to the Mahenye community, both floral and faunal biodiversity in the Mahenye wilderness area appeared to be very healthy. While a few questionnaire respondents in Mahenye (11.3%) felt that biodiversity was declining in the wilderness area, the majority of the respondents (84.7%) indicated that biodiversity was not declining but, on the contrary, was abundant and actually increasing. Periodic game counts by resource monitors were also reported to highlight positive biodiversity trends. It was on the basis of the perceived increase in biodiversity in the area that residents of Mahenye were constantly calling for an upward revision of the hunting quota, particularly that of elephants, from the current 4-5 elephants to 8-10 per year. The CAMPFIRE Chief Resource Monitor noted that, while poaching had indeed increased in Mahenye since 2000, illegal access to resources had not yet reached levels detrimental to the overall health of the biodiversity in Mahenye, and measures needed to be taken to address this problem. He further noted that most of the poaching was actually a show of protest for declining CAMPFIRE benefits to the community by residents, and could soon disappear if community benefits were restored to pre-2000 levels.

The findings of this study on the status of biodiversity in the two conservation areas question the views held by proponents of strict protection in conservation highlighting the incompatibility of biodiversity conservation and livelihoods goals. Protectionists have often

argued that pursuing conservation simultaneously with livelihoods objectives has made biodiversity conservation ineffective (Agrawal and Redford, 2006; Bauch et al, 2014; Kramer et al, 1997; Kramer and van Schaik, 1997; Redford et al, 1998). Even the increase in poaching in Mahenye after 2000, which has been spurred by declining CAMPFIRE benefits, is testimony to the fact that for biodiversity conservation to be effective, it has to be sensitive to the socio-economic circumstances of poor adjacent communities (Andam et al, 2010; Gurney et al, 2014; Meilby et al, 2014; Scherl et al, 2004).

7.3 Recommendations

This section suggests some recommendations based on the findings of the study summarised above. The aim is to come up with measures that will enhance the attainment of conservation-livelihood objectives in the conservation areas.

7.3.1 Enhancement of livelihood benefits from conservation areas

The study has shown that the conservation areas have brought various livelihood benefits to the local communities. However, the majority of the community respondents in both Mahenye and Chizvirizvi indicated that the benefits were not adequate, and have been declining since 2000 due to the political and economic decline in the country. The study suggests various measures that can be adopted for enhancing livelihood benefits from conservation.

One of the livelihood benefits from the conservation areas to the local communities has been that of income generation at both the community and household levels, with employment creation realised in both Mahenye and Chizvirizvi. However, the number of people employed by the conservation areas was very small in relation to the total numbers of people in these communities. Employment creation could further be enhanced in Mahenye by repairing and reopening the Mahenye Safari Lodge that was destroyed by flooding in 2008. An interview with the manager at Chilo Lodge indicated that 16 more jobs would be created for local residents through the reopening of the lodge. This would bring to 68 the number of local residents in conservation-related employment in Mahenye from the current 52. Since it has been noted that it was men who had taken most of the conservation jobs in Mahenye, measures should be taken to ensure that more women take up these jobs once the lodge is reopened.

Malilangwe could enhance employment creation in Chizvirizvi and other communities sharing boundaries with it by coming up with a deliberate hiring policy prioritising bordering communities. This is because, compared to communities with no common boundary with the protected area, these communities directly bear the burden of the costs from the conservation area including infestation of crop fields by quelea birds among other inconveniences identified earlier. Such preferential treatment would also have an added advantage of improving relations with the neighbouring communities thereby ensuring the conservation area's survival. Currently, Malilangwe hiring policy states that 65% of employees should come from Chiredzi District of Masvingo Province, 25% from other districts of Masvingo Province while the remaining 10% comes from anywhere else across the country, with no special treatment for communities sharing a boundary with the conservation area. Probably 50% of employees should come from communities bordering the conservation area.

The study has also revealed that most of the local residents being hired for conservation-related employment from Mahenye and Chizvirizvi were taking up low-skill and therefore lowly paid jobs due to lack of, or inadequate, educational qualifications. Malilangwe and the various employers in Mahenye such as Chilo Lodge, Zambezi Hunters and the CAMPFIRE project could send for training some of their employees from the local communities qualifying to enrol at colleges and other training institutions in the country. This will enable the local residents to get the higher-paying jobs currently being taken by non-local people. In addition, the attained qualifications will eventually reduce the dependence of the local residents on the conservation areas for employment creation as some of them will now be able to look for employment elsewhere, which will in turn reduce the pressure on the conservation areas to create employment for the local residents. Both of the above scenarios will enhance relations between the conservation areas and the local communities which is crucial for the survival of the protected areas. The protected areas also need to resume the bursaries at various educational levels so as to ensure that a significant number of people from the local residents employed by the conservation areas qualify to enrol at the various training institutions in the country.

The selling of crafts by local residents to visiting tourists has also been identified as another income enhancement activity in both Mahenye and Chizvirizvi that has been stimulated by the conservation areas. Malilangwe and Chilo Lodge could further enhance this livelihood activity by hosting curio shops for selling crafts from the local communities. This would greatly improve the marketing of the crafts to tourists as some tourists do not visit the local

communities. However, caution should be exercised to ensure that craft activities that rely on the extraction of natural resources be sustainable.

Malilangwe and Chilo Lodge could source some of their food requirements from Chizvirizvi and Mahenye, respectively, which would enhance household incomes in these areas. The residents of these communities could sell their cattle, goats, sheep, chicken, vegetables and other supplies in exchange for cash. Currently, Malilangwe and Chilo Lodge are getting their food supplies from the nearby towns yet they could get these from the local communities. This could require the revival of the collapsing community gardens in Chizvirizvi by Malilangwe and the setting up of similar gardens in Mahenye with the help of CAMPFIRE. In addition, the conservation areas could sponsor the training of local residents in other income generating projects such as bee keeping and mushroom farming. Such projects could further augment household incomes through honey and mushroom selling, in addition to enhancing nutrition in the local communities.

Malilangwe could help Chizvirizvi residents in setting up a community-managed holding company from which the conservation area would then outsource some of its support services. The community-managed company could start offering simple services such as laundry, general cleaning, security and fire guard maintenance until it could offer more advanced services such as vehicle, road and fence maintenance, among other services. The conservation area could fund the training of some of the Chizvirizvi residents in various trades, including business management and then recover its money once the company starts operating. This would enhance income at the community level in Chizvirizvi by Malilangwe as the conservation area, compared to CAMPFIRE, was currently only contributing to income enhancement at the household level. The money could then be used for funding various community development projects by Chizvirizvi residents. In addition, the move would help in building trust between the conservation area and the community as it was shown earlier that there was some level of mistrust between the two entities, with the latter accusing the former of using community development just as a tool for attracting donor funding and then withholding the funds for own use.

Malilangwe and Chizvirizvi could also partner with one of the mineral water bottling companies in the country in setting up a bottling facility at the Chingonji spring in Village 11 in Chizvirizvi. Such a project would be highly viable as mineral water demand has risen rapidly in Zimbabwe due to declining drinking water quality, particularly in the urban areas,

as a result of increased pollution and failure by local authorities to secure adequate water purification chemicals under the current economic crisis. The proceeds from the selling of mineral water could then be shared between Malilangwe, Chizvirizvi and the partnering company. This would further enhance income generation in Chizvirizvi at the community level.

While agriculture has been identified as the main livelihood activity in both Mahenye and Chizvirizvi, the conservation areas, particularly the Mahenye CAMPFIRE project, have not contributed much to the enhancement of this livelihood activity. While Malilangwe has contributed to the development of agriculture in Chizvirizvi through committing resources towards the setting up of self-contained plots, CAMPFIRE has not done anything to enhance agriculture in Mahenye. The conservation areas therefore need to come up with development strategies jointly with local community participation that support, complement and enhance farming, the main livelihood source for the residents of Mahenye and Chizvirizvi. It is important to note that the majority of the respondents in both study sites indicated that the conservation areas could bring adequate development to their communities through agricultural development in the form of irrigated agriculture, livestock rearing and the growing of drought resistant crop varieties.

7.3.2 Elimination of hindrances to the flow of livelihood benefits

The study has identified various internal and external hindrances to the flow of livelihood benefits from the conservation areas to the local communities. One of the main external hindrances was the decline in international tourist arrivals into the country due to the negative political developments since 2000 (Rihoy and Maguranyanga, 2007; Rihoy et al, 2010). This has negatively impacted ecotourism activities upon which both Malilangwe and the CAMPFIRE project depend on for income generation, resulting in the conservation areas either downsizing or stopping some of their community development projects citing lack of funds. Malilangwe and Chilo Lodge could take measures to promote domestic tourist visits to fill the gap that has been created by the decline in international tourist arrivals. One such measure could be the setting up of a competitive pricing regime that would attract visitors from within the country, which would improve occupancy rates at the ecotouristic lodges. Such a move would further be enhanced by the improved circulation of foreign currency in the country's economy following the adoption of the multicurrency system by government in 2009.

Another major external hindrance to the flow of livelihood benefits in the Mahenye CAMPFIRE project, and other similar projects across the country, has been the lack of complete devolution of appropriate authority to manage natural resources and accrue benefits at the grassroots level (Mashinya, 2007; Nelson, 2010; Ribot, 2004; Rihoy and Maguranyanga, 2007; Rihoy et al, 2010). This has seen RDCs retaining 41% of gross CAMPFIRE hunting revenue, leaving the local communities with diminished benefits. This arrangement has acted as a major disincentive for natural resource management among the local residents in Mahenye, leading some to poach for resources from the community-managed protected area. There is therefore a need to change the institutional framework of the national CAMPFIRE programme so as to allow for the complete devolution of appropriate authority to sub-district structures, which will allow local communities to fully benefit from local resources without the costly intermediary role of RDCs. However, the collapse of institutional capacity in Mahenye requires that the complete devolution path be treated with caution at present. The study has revealed evidence of the lack of accountability in the handling of project funds by successive CAMPFIRE Committees and chairpersons in Mahenye, and complete devolution under the current conditions would thus only translate into the misappropriation of more community funds by a few individuals. There is thus a need to re-establish institutional capacity in the Mahenye CAMPFIRE project, and similar projects across the country, before there is complete devolution of appropriate authority. With ZIMTRUST and the other former CCG member organisations now side-lined from institutionally supporting CAMPFIRE by government, the CA could identify other partner-organisations to help with institutional capacity building in CAMPFIRE.

There should be a decoupling of the CAMPFIRE project from the local leadership as the study has revealed that the chieftaincy wields tremendous influence over the community natural resource management project, and is using its powers to unfairly benefit from the community project at the expense of the other residents. The traditional leadership in Mahenye should therefore stop using the other half of the CAMPFIRE shop, should not receive any extra financial benefits from CAMPFIRE apart from the household dividends being received by everyone else and should stop interfering with the election, and functioning, of the CAMPFIRE Committee. The study has revealed that the influence of the traditional leadership has immensely contributed to the institutional collapse of the Mahenye CAMPFIRE project. Similarly, the influence of the Chief on the remaining community garden being sponsored by Malilangwe in Chizvirizvi should be removed. The conservation

area should ensure that all residents benefit equally from its community development projects without any discrimination. This will stop the projects from being a platform for community disharmony, a situation that will have some ripple effects on community-conservation area relations.

The non-involvement of community residents by the conservation areas in decision-making has also been identified as another hindrance to the flow of livelihood benefits. There should thus be more regular general meetings between the MCC and the Mahenye residents so as to promote collective decision-making in the CAMPFIRE project. It would be best for the meetings to coincide with the quarterly release of hunting fees by the hunter so that the whole community decides on how the money should best be used. Malilangwe should also consult Chizvirizvi residents on their developmental needs so as to come up with demand-driven community development projects capable of addressing the developmental aspirations of the people. This will further enhance relations between the conservation area and the community.

Lack of influence over the setting of the hunting quota and the selection of the hunter were also identified as hindrances to the flow of livelihood benefits by the residents of Mahenye. The views of communities in CAMPFIRE areas should more seriously be considered in the final setting of hunting quotas and in the selection of hunters as such decisions are currently being unilaterally taken by the PWLMA and RDCs, respectively. In addition, failure by hunters to fill up their hunting quotas has also led to reduced CAMPFIRE revenue. Hunters should therefore pay the full hunting fees tallying with the set hunting quotas regardless of whether they have filled the quotas or not. This will push the hunters to look for clients. Such issues as failure to fill hunting quotas and late disbursement of quarterly hunting fees by hunters to the communities are some of the factors that should be considered when selecting hunters.

7.3.3 Reduction of livelihood costs from conservation

One way of enhancing the livelihood benefits from the conservation areas to local communities would be through the reduction, and where possible elimination, of the earlier identified livelihood costs being incurred by the communities adjacent to the conservation areas. Among some of the major livelihood costs to Mahenye residents from the community-conserved area was the destruction of crops and livestock and human harassment by wildlife from the conservation area, which has been worsened by weak PAC. This could be solved by improving PAC to deter and scare away wild animals from fields, livestock grazing areas or

homesteads. The 26% of gross hunting income being retained by Chipinge Rural District Council as wildlife management levy should be released to the Mahenye community for use in PAC. The money could be used for buying guns, communication devices and uniforms for resource monitors. This is because wildlife management happens at the local community level where the animals interact daily with the people and therefore there is no reason why RDCs should hold on to these funds. The infestation of small-grained crops by quelea birds was identified as one of the main livelihood costs from Malilangwe to Chizvirizvi residents. Malilangwe could solve this problem by promoting the growing of small-grain varieties that are not eaten by birds. The existence of such varieties was confirmed in an interview with the AREX officer for the area and includes NS5511, Smile and Red Swazi varieties for sorghum.

With improved PAC, the need to compensate villagers for losses incurred from wildlife damages would greatly be reduced. However, where and when such losses occur there should be prompt compensation so as to cushion affected households. This entails that both Malilangwe and CAMPFIRE should come up with comprehensive compensation policies covering various categories of loss ranging from crop damage, devouring of livestock by wildlife, injuries and deaths of people from wildlife attacks among other losses. There might be need for conservation areas to put identification marks on their wildlife so as to make it easy in assigning compensation responsibilities on the conservation areas as problem animals would now be traceable to specific conservation areas. This would be particularly important in Chizvirizvi where, while Malilangwe is the closest conservation area to the community, most, if not all, of the wildlife seen in the area is not from Malilangwe but comes from other nearby conservation areas such as Save Valley Conservancy, Chiredzi River Conservancy and Gonarezhou National Park with no electric fences to prevent the escape of wild animals.

The possibility for the spread of diseases from wildlife to livestock from the Mahenye wilderness area and Malilangwe has been found to be real in both Mahenye and Chizvirizvi, respectively. The study has shown that, while wildlife rarely escapes from Malilangwe due to the electric fence, the wildlife in the conservation area constantly experiences disease outbreaks. In the event of breaks by infected wild animals from Malilangwe, the spread of diseases to the livestock in Chizvirizvi and other surrounding communities is thus highly probable. There were also two suspected cases of foot and mouth in Mahenye in 2012. With assistance from the Veterinary Department, the conservation areas could take some preventative measures so as to effectively stop the possible spread of wildlife diseases by funding the vaccination of livestock in communities closest to them against the most common

wildlife diseases in these areas. Alternatively, the conservation areas could set up some livestock dipping facilities in the nearby communities so as to eliminate some vectors capable of spreading wildlife diseases to livestock.

7.3.4 Recommendations for further study

This study has compared two conservation approaches, namely, a private protected area and a community-conserved area, in terms of their contributions to local livelihoods. There is need for more comparative studies involving community, private and state parks so as to generate more information and debate for informing conservation-development policy in Zimbabwe. This will enable the crafting of conservation-livelihoods initiatives cutting across various conservation approaches.

There is need for coming up with a national mechanism or policy that requires entities neighbouring protected areas, and causing environmental degradation, to contribute some funds towards conservation activities in the protected areas. Part of the money received by the conservation areas would then be used for funding development projects in neighbouring communities, which would further enhance conservation-livelihoods initiatives by the conservation areas. Some of the entities neighbouring Malilangwe which are contributing to environmental degradation include, inter alia, Triangle Sugar Estates, Hippo Valley Sugar Estates, Steel Makers and Coal Zimbabwe. Among the entities neighbouring Mahenye and contributing to environmental degradation include Chisumbanje Biofuels, Cobra Mine, Deon Mine, Hippo Seven Ashelite Mine and Hippo Seven Copper Mine. The mechanism will also simultaneously act as an economic instrument for forcing the environmentally-damaging entities to reduce their negative environmental impacts.

The REDD+ initiative, where conservation organisations and forest dependent communities receive financial and other incentives mainly from organisations in developed countries for covering their carbon footprints through forest conservation (Blom et al, 2010; Leventon et al, 2014) could also be tried in Mahenye and Malilangwe and other conservation areas in Zimbabwe. There is thus need for carrying out research to assess the possibilities of implementing REDD+ in Mahenye and Malilangwe and other conservation areas in the country. Such research would provide recommendations on measures that need to be adopted for the successful implementation of REDD+ in the various conservation approaches in Zimbabwe. One of the conditions that need to be fulfilled in the design or implementation of REDD+ projects includes land ownership, which is perceived as a precondition for payment

(Awono et al, 2014). This would therefore require land tenure reforms to bestow land ownership rights on communities such as Mahenye.

7.4 Conclusions

The study has compared two conservation areas, a private protected area, Malilangwe, and a community-conserved area, Mahenye, in terms of their contributions to the livelihoods of the residents of Chizvirizvi and Mahenye communities, respectively. Numerous similarities were identified in relation to the livelihood impacts of the protected areas on local communities. Both protected areas have contributed to the enhancement of income, education, health and environmental sustainability in the targeted communities. Very few differences in the livelihood impacts of the protected areas were identified: while the Mahenye CAMPFIRE project had enhanced income at both the household and community levels, Malilangwe had only contributed income at the household level in Chizvirizvi; while CAMPFIRE had constructed some new school buildings at the two schools in Mahenye, Malilangwe had only renovated pre-existing school buildings in Chizvirizvi; while Malilangwe had constructed a clinic and a waiting-mothers' shelter in Chizvirizvi, CAMPFIRE had only constructed a few toilets at Mahenye Clinic. In fact the above were not real differences, but were just different approaches to achieving similar livelihoods goals by the conservation areas.

The main contribution of this study to the conservation-development discourse in Zimbabwe is that it has shown that, besides the much publicised CAMPFIRE programme, there are other conservation approaches that can achieve similar, if not better, livelihood impacts on surrounding communities. The similarities in the livelihood impacts of Malilangwe and the Mahenye CAMPFIRE project have already been highlighted. Areas where Malilangwe appeared to offer better livelihood impacts compared to CAMPFIRE included health, bursaries and agricultural support. In terms of agriculture, and as shown earlier, Malilangwe contributed funds and other resources for the setting up of the large self-contained plots in Chizvirizvi, while the Mahenye CAMPFIRE project had not contributed to agricultural development in Mahenye. The significance of this contribution by the current study to the conservation-development nexus in Zimbabwe is that it informs policy-makers on the need to promote other conservation approaches such as private protected areas, besides CAMPFIRE, as alternative, and equally effective, vehicles for attaining rural development through conservation. This is particularly important in areas where private protected areas share

boundaries with poor rural communities. The study therefore highlights the significance and potential of private protected areas in contributing to rural development in Zimbabwe.

The other significance of the current study to the conservation-livelihoods discourse in Zimbabwe, and elsewhere, is that it has shown that, indeed, conservation and development are not necessarily 'two sides of two different coins' but rather 'two sides of the same coin' which can simultaneously and successfully be pursued without compromising the ecological integrity of the protected areas involved (Saha and Sundriyal, 2012; Shackleton and Pandey, 2014; Wilshusen et al, 2002). As shown earlier, there were positive trends in biodiversity in both Malilangwe and the Mahenye wilderness area, locations pursuing conservation jointly with development goals. This, in a small way, challenges the long-held stance by strict protectionists that conservation and development agendas are totally strange to each other and thus cannot be jointly pursued without causing biodiversity loss (Agrawal and Redford, 2006; Brandon et al, 1998a; Kramer et al, 1997; Kramer and van Schaik, 1997; Wells and Brandon, 1992).

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APPENDIX A: LOCAL COMMUNITY QUESTIONNAIRE

Q. No.__

This questionnaire forms part of the data as partial requirement for a PhD degree at the School of Environmental Sciences, University of KwaZulu-Natal, Durban. The research is on biodiversity conservation and rural livelihoods. The research is aimed at assessing how biodiversity conservation areas in Zimbabwe are contributing towards the enhancement of the livelihoods of local communities.

You are kindly asked to participate in the study. The information you provide is strictly confidential and your personal details will remain anonymous and protected.

Please **tick only one response** in the boxes provided or write your own response that suits you best in the space provided. **You may tick more than one response ONLY where multiple responses are permitted**. Depending on how you would have answered an earlier question, some subsequent question(s) may be skipped.

Name of Conservation Area _____

1. DEMOGRAPHIC AND SOCIO-ECONOMIC INFORMATION

1.1 Gender of respondent

1. Male		2. Female	

1.2 Age of respondent (years)

1. 18-25		4. 46-55	
2. 26-35		5. 56-65	
3. 36-45		6. >65	

1.3 What is the highest level of formal education you have attained?

1. No formal education	
2. Lower primary (Grade 1-4)	
3. Upper primary (Grade 5-7)	
4. Junior High (Form 1-3)	
5. Senior High (Form 4-6)	
6. Certificate	
7. Diploma	
8. Degree	
Other (specify)	

1.4 Marital status

1. Single		4. Divorced	
2. Married		5. Widowed	
3. Separated		6. Never married	

1.5 Number of people in your household

1	2	3	4	5	6	7	8	9	10	>10 (specify)

1.6 Main occupation

1. Farmer		2. Formally employed professional	
3. Unskilled labourer/worker		4. Business owner	
5. Selling of crafts/wild natural resources		6. Other (specify)	

1.6.1 Would you wish to engage in any other economic activity?

1. Yes		2. No	

1.6.2 If yes, indicate what type of economic activity?

1. Commercial farming		2. Professional employment	
3. Run business		Other (specify)	

1.6.3 If yes, what is preventing you from engaging in this economic activity?

1. Lack of resources		2. Lack of skills	
3. Lack of skills and resources		4. Lack of infrastructure	
5. Lack of energy/electricity		Other (specify)	

1.6.4 List your various sources of monthly household income (multiple responses permitted)

Sources	
1. Farming	
2. Wage/salary	
3. Remittances	
4. Pension	
5. Grants	
6. Fishing	
7. Selling of crafts/wild resources	
Other (specify)	

1.6.5 What is your average total monthly income? (USD)

1. < 50		2. 50-100		3. 101-150	
4. 151-200		5. 201-250		6. 251-300	
7. 301-350		8. 351-400		9. >400	

1.7 If engaged in farming, which farming activities do you practise?

1. Subsistence crop production		2. Commercial crop production	
3. Subsistence livestock rearing		4. Commercial livestock rearing	
5. Subsistence crop and livestock production		6. Commercial crop and livestock production	
Other (specify)			

1.7.1 How large is your landholding? (Hectares)

1. <1		6. 21-25		11. 46-50		16. 71-74	
2. 1-5		7. 26-30		12. 51-55		17. 76-80	
3. 6-10		8. 31-35		13. 56-60		18. 81-85	
4. 11-15		9. 36-40		14. 61-65		19. 86-90	
5. 16-20		10. 41-45		15. 66-70		20. >90	

1.7.2 What is the system of tenure for the land you occupy?

1. Private (with title deeds)		2. Tenancy/leasehold	
3. Communal ownership		Other (specify)	

1.7.3 If engaged in livestock rearing, what are the main animals reared?
(Multiple responses permitted)

	1. Cattle	2. Goats	3. Sheep	4. Pigs	5. Poultry	6. Donkeys	Other (specify)
Number							

1.7.4 What are the main challenges you face in your farming?
(Multiple responses permitted)

1. Shortage of land		2. Lack of farming skills	
3. Lack of resources		4. Lack of farming skills and resources	
5. Destruction of crops by wild animals from the conservation area		6. Aridity	
Other (specify)			

1.8 Type of dwelling

1. Formal house (brick and roofing sheets)		2. Formal house plus thatched brick house/s	
3. Formal house plus traditional hut/s		4. Thatched brick houses	
5. Traditional hut/s (thatched pole and dagga)		6. Combined formal house, thatched brick house and traditional huts	
7. Informal structure		Other (specify)	

1.9 Type of sanitation (toilet)

1. None		2. Flush toilet	
3. Pit latrine		Other (specify)	

1.10 Main source of domestic water

1. Tap water in house		2. Tap water on site	
3. Public tap		4. Rainwater tank on site	
5. Communal borehole		6. Spring (chitubu)	
7. Well (tsime)		8. River/stream/dam	
Other (specify)			

1.11 What are the sources of energy used for lighting? (Multiple responses permitted)

1. Electricity from public supply	
2. Gas	
3. Paraffin	
4. Solar panels	
5. Generator	
6. Coal	
7. Fuel wood	
8. Candles	
9. Shelled maize cobs	
10. Dung	
Other (specify)	

1.11.1 What are the sources of energy used for cooking? (Multiple responses permitted)

1. Electricity from public supply	
2. Gas	
3. Paraffin	
4. Solar panels	
5. Generator	
6. Coal	
7. Fuel wood	
8. Shelled maize cobs	
9. Dung	
Other (specify)	

1.11.2 What are the sources of energy used for heating? (Multiple responses permitted)

1. Electricity from public supply	
2. Gas	
3. Paraffin	
4. Solar panels	
5. Generator	
6. Coal	
7. Fuel wood	
8. Shelled maize cobs	
9. Dung	
Other (specify)	

1.12 Time taken to nearest source of community services

Service	Time taken to nearest source of service (see codes below)
1. Water supply	
2. Clinic	
3. Primary school	
4. High school	
5. Main road	
6. Public transport	
7. Shops	
8. Police station	

Time taken: 1. **<10 minutes**
2. **10-20 minutes**
3. **21-30 minutes**
4. **31-40 minutes**
5. **41-60 minutes**
6. **> 1 hour (specify)**

1.12.1 Community services quality rating

Service	Service quality rating (see codes below)
1. Water supply	
2. Clinic	
3. Primary school	
4. High school	
5. Main road	
6. Public transport	
7. Shops	
8. Police station	

Service quality rating: 1. **Satisfied**
2. **Neutral**
3. **Dissatisfied**

1.12.2 Community services development priority

Service	Development priority of service (see codes below)
1. Water supply	
2. Clinic	
3. Primary school	
4. High school	
5. Main road	
6. Public transport	
7. Shops	
8. Police station	

Service development priority rating: 1. **Important**
2. **Neutral**
3. **Unimportant**

1.13 For how long have you been living in this area?

1. <5 years		2. 5-10 years		3. 11-15 years	
4. 16-20 years		5. 21-25 years		6. >25 years	

1.14 Would you like to move out of this place?

1. Yes		2. No	

1.14.1If yes, why would you like to move? (Multiple responses permitted)

1. Shortage of land		2. Harassment by conservation enforcement agents	
3. Lack of employment opportunities		4. Poor services (education, health, etc.)	
5. Poor infrastructure (roads etc.)		6. High crime rates and insecurity	
Other (specify)			

1.15 How would you describe the poverty levels of your household?

1. No poverty		2. Low		3. Moderate		4. High		5. Very high	

1.16 How would you rate your reliance on natural resources for your livelihood?

1. Very strong		2. Strong	
3. Moderate		4. Weak	
5. Very weak		6. Do not rely on natural resources at all	

1.16 Which of the following resources do you frequently collect from the natural environment around you? (Multiple responses permitted)

1. Meat	
2. Fish	
3. Edible insects	
4. Fruits	
5. Vegetables	
6. Mushrooms	
7. Medicines	
8. Dyes	
9. Timber	
10. Thatching grass	
11. Clay (for construction)	
12. Firewood	
13. Flowers	
Other (specify)	

2. COMMUNITY LIVELIHOOD BENEFITS FROM CONSERVATION

2.1 What are the benefits to the local community of living within or next to the conservation area? (Multiple responses permitted)

1. None	
2. Get game meat	
3. Employment opportunities	
4. Business opportunities	
5. Get community development assistance from conservation area	
6. Help with transport	
7. Children are able to see and know different kinds of wild animals	
Other (specify)	

2.2 What business opportunities (if any) has the conservation area stimulated?

1. Selling of crafts to tourists		2. Selling of vegetables and other foods to lodges	
3. Access to foreign currency from tourists		Other (specify)	

2.3 Do you or any of your household members work at the conservation area?

1. Yes		2. No	

2.3.1 If yes, complete the table below

Number of family members	Type of job	Nature of job (see codes below)	Amount contribution to household income per month (see codes below)
1.			
2.			
3.			
4.			
5.			
6.			

Codes: Income- 1. <50USD
2. 50-100
3. 101-150
4. 151-200
5. 201-250
6. 251-300
7. 301-350
8. 351-400
9. >400

Nature of job- 1. Permanent
2. Temporary/seasonal

2.4 If conservation area supports community development projects, what development projects have been developed or funded to date? (Multiple responses permitted)

1. Schools/school buildings		2. Clinics/clinic buildings	
3. Roads		4. Bridges	
5. Boreholes		6. Dip tanks	
7. Grinding mills		8. Community halls	
Other (specify)			

2.5 Have your ever received some household cash dividends from the conservation authority?

1. Yes		2. No	

2.6 Do you view conservation (including the benefits being derived from it) as a form of, or tool for, development in your area?

1. Yes		2. No	

2.6.1 If yes, has conservation brought adequate development to your area? Explain your response in the table

1. Yes	2. No

2.6.2 If no to 2.6 above, what then are the alternative activities that can be promoted or funded by the conservation area to enhance meaningful development in your area? (Multiple responses permitted)

1. Crop production (with irrigation)	
2. Livestock rearing/ranching	
3. Expansion of rural service centres	
4. Infrastructural development	
Other (specify)	

3. COMMUNITY LIVELIHOOD COSTS FROM CONSERVATION

3.1 What are the challenges (costs) to the local community of living within or next to the conservation area? (Multiple responses permitted)

Challenge	
1. Restrictions on access to, and use of, traditional resources	
2. Loss of land and livelihoods	
3. Damage to property and crops by wildlife	
4. Human harassment by wildlife	
5. Harassment by conservation enforcement agents	
6. Competition with wildlife for water and grazing in the dry season	
7. Cannot expand agricultural land	
Other (specify)	

3.2 Do you require access into the protected area for the following resource uses?

	Yes	**No**
1. Grazing	1	2
2. Recreation	1	2
3. Food gathering	1	2
4. Hunting	1	2
5. Fishing	1	2
6. Cultivation	1	2
7. Fuel wood collection	1	2
8. Collect thatching grass	1	2
9. Watering/Irrigation	1	2
10. Cultural/Social activities	1	2
Other (specify)		

3.2.1 If you require access to resources in the protected area, is permission granted?

	Yes	**No**
1. Grazing	1	2
2. Recreation	1	2
3. Food gathering	1	2
4. Hunting	1	2
5. Fishing	1	2
6. Cultivation	1	2
7. Fuel wood collection	1	2
8. Collect thatching grass	1	2
9. Watering/Irrigation	1	2
10. Cultural/Social activities	1	2
Other (specify)		

3.3 Are you sometimes, through desperation, forced to unofficially collect resources from the conservation area?

1. Yes		2. No	

3.4 How would you describe the relations between the community and the conservation area?

1. Very good		2. Good		3. Satisfactory	
4. Poor		5. Very poor			

3.4.1 What do you think is the reason for the nature of the relations you have stated above? (Multiple responses permitted)

1. Protected area has respect for the local people		3. Protected area does not interact with the community	
2. Protected area initiates local development projects		4. Protected area harasses local people	
6. Other (specify)		5. Protected area does not compensate for losses/damages	

3.5 How best would you describe the nature of community involvement in conservation activities by the conservation authority?

1. Passive (told what's going to happen)	
2. Information giving (answer questions from extractive researchers)	
3. Functional (meet predetermined objectives)	
4. Interactive (joint analysis and action)	
5. Other (specify)	

3.6 Would you report poachers/illegal encroachers into the conservation area to conservation authorities? Explain your response in the table.

1. Yes	2. No

4. PERCEPTIONS ON THE STATE OF BIODIVERSITY AND THREATS TO IT

4.1 What was the state of biodiversity (wild plants and animals) before the establishment of the conservation area?

1. Abundant		2.Threatened	
3. Scarce		4. Rare	
5. Extinct		6. Don't know	

4.1.1 What is the current state of biodiversity after the establishment of the conservation area?

1. Abundant		2.Threatened	
3. Scarce		4. Rare	
5. Extinct		6. Don't know	

4.2 In your view, would you say biodiversity is declining in the conservation area?

1. Yes		2. No		3. Don't know	

4.2.1 If yes, what are the indicators of biodiversity decline in the conservation area? (Multiple responses permitted)

1. Declining vegetation cover		2. Declining wild animal populations	
3. Declining vegetation cover and wild animal populations		4. Some wild animals are no longer seen in the area	
Other (specify)			

4.2.2 If biodiversity is declining, what are the major factors contributing to the decline? (Multiple responses permitted)

Factor	
1. Ineffective conservation approaches	
2. Increasing human populations	
3. Over-reliance on natural resources by locals	
4. Poaching and illegal encroachment by locals	
5. Rapid physical developments and land use changes around conservation area	
6. Increased isolation of the ecosystem of the conservation area from the broader ecosystem	
7. Climate change (area getting drier)	
8. Pollution	
Other (specify)	

5. STRATEGIES FOR BALANCING CONSERVATION AND LIVELIHOODS OBJECTIVES

5.1 In what ways do you think the conservation authority can best meet both the conservation and community livelihoods goals? (Multiple responses permitted)

1. Increase conservation benefits to local communities	
2. By seriously including locals in conservation decision making	
3. By allowing controlled access to resource use in the conservation area	
4. By lobbying other organisations to meet community developmental needs and aspirations	
5. By establishing fuel wood plantations	
6. By providing production and marketing assistance for agricultural commodities	
Other (specify)	

THANK YOU FOR YOUR PARTICIPATION

APPENDIX B: KEY INFORMANTS' INTERVIEW SCHEDULE

The questions below will be used as a guide in probing for information in interviews with key informants from conservation authorities, local community leaders and representatives of relevant organisations concerning conservation and community livelihoods. Depending on the position and role of the interviewee, some questions may not apply.

1. Would you please describe the general socio-economic status of people in your/the local community?

2. What are the factors influencing the socio-economic status of people in your/the local community?

3. Would you please describe the state of biodiversity in the conservation area?

4. What do you perceive to be the threats to the biodiversity in the conservation area?

5. In what ways has the conservation area enhanced/threatened biodiversity?

6. In what ways has the conservation area benefited your/ the local community?

7. What have been the costs to your/the local community from the conservation area?

8. What factors are hindering the flow of benefits to your/the local community from the conservation area?

9. What grievances do you have against the conservation area and how do you suggest these should be addressed?

10. What do you suggest could be done so as to enhance the benefits to your/the local community from the conservation area?

11. What do you suggest could be done so as to reduce the costs to your/the local community from the conservation area?

12. What challenges are you encountering in your efforts to simultaneously conserve biodiversity and enhance local community livelihoods?

13. What do you suggest could be done by the conservation area so as to maintain a balance between biodiversity conservation and the enhancement of local livelihoods?

APPENDIX C: FOCUS GROUP SCHEDULE

I would like to thank you all for coming today. My name is Tanyaradzwa Chigonda and my assistant is----------

Over the next few days our research team will be conducting group discussions with people in communities around different conservation areas as part of a PhD research project on 'Biodiversity Conservation and Rural Livelihoods'. The aim of the research is to examine how conservation areas in Zimbabwe are enhancing or hindering the livelihoods of surrounding communities. Your views and opinions are going to be very valuable to this research.

Let me tell you a little about how we will conduct the group discussion today. Your participation in this group discussion is voluntary. If you prefer not to be part of this discussion you are completely free to leave. However, we value all your opinions and hope that you will stay and share your views. Whatever we discuss will be confidential and used only for this research project. Let me say that there are no right or wrong answers. We will simply be asking for your own opinions and experiences and so please feel comfortable to say what you really think. We would like to hear as many different points of view as possible, so feel free to disagree with someone else and share your own view, but please also respect the views of others. We will not be going around the room, just join in when you have something to say or you want to respond to someone else's point. However, it is important that only one person talks at a time so that we do not miss anything on recording.

During the discussion ----------will be taking notes and reminding me if I forgot to ask something. This discussion will probably last for about one to one and a half hours. Please help yourselves to the refreshments provided. Are there any questions before we start? Thank you.

1. Would you please describe the general socio-economic status of people in your community?

2. What are the factors influencing the socio-economic status of people in your community?

3. Would you please describe the state of biodiversity in the conservation area?

4. What do you perceive to be the threats to the biodiversity in the conservation area?

5. In what ways has the conservation area enhanced/threatened biodiversity?

6. In what ways has the conservation area benefited your community?

7. What have been the costs to your community from the conservation area?

8. What factors are hindering the flow of benefits to your community from the conservation area?

9. What grievances do you have against the conservation area and how do you suggest these should be addressed?

10. What do you suggest could be done so as to enhance the benefits to your community from the conservation area?

11. What do you suggest could be done so as to reduce the costs to your community from the conservation area?

12. What challenges, in your view, are being encountered in efforts to simultaneously conserve biodiversity and enhance local community livelihoods?

13. What do you suggest could be done by the conservation area so as to maintain a balance between biodiversity conservation and the enhancement of local livelihoods?