

A PARTICIPATORY SUSTAINABILITY ASSESSMENT FRAMEWORK FOR BIODIVERSITY CONSERVATION IN RURAL AREAS

By

LIMPHO MALERATO SENIOR LETŠELA

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Promoter: Prof. AJ Pelsler (Department of Sociology, Faculty of Humanities)
Co-Promoter: Prof. MT Seaman (Centre for Environmental Management, Faculty of
Natural and Agricultural Sciences)

CERTIFICATE

I declare that this thesis hereby submitted by me for doctor of philosophy degree at the University of the Free State is my own independent work and has not previously been submitted by me at another university/faculty. I furthermore cede copyright of the thesis in favor of the University of the Free State.

Limpho Letšela

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DEDICATION

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SUMMARY

Biodiversity conservation is critical for the continued supply of ecosystem services to secure the sustainability of livelihoods, especially for poor rural people. Therefore, current rates of biodiversity loss, which threaten human survival, need to be curbed using effective interventions. Implementation and decision-making on interventions require timely information. Undertaking a Sustainability Assessment (SA) and structuring this information within a SA framework of components and objectives is one effective way to aid decision-makers. An effective SA framework addresses key sustainability issues and priorities that are aligned with the regulatory policy and legal framework, as well as stakeholder aspirations.

Sustainability Assessment development and application is evolving and is more widespread in developed countries than developing countries. Hence, this study sought to investigate how to apply SA in a participatory manner within rural areas in a developing country. Key objectives of the study focused on: i) identification of key aspects that make a SA framework effective; ii) mechanisms of effectively incorporating participation into SA processes; iii) investigations of the perceptions of stakeholders regarding the ecosystem and human conditions required for the sustainability of biodiversity conservation; and iv) determination of stakeholder perceptions on progress towards sustainability.

The study was conducted in Lesotho within a trans-boundary project area. The project is known as the MDTP and is a collaborative initiative between Lesotho and South Africa to conserve globally significant biodiversity. A qualitative case study approach was employed through a combination of techniques including a literature review, field observations, key informant interviews, group discussions and workshops to collect data. Study participants consisted of MDTP partners at the national, district and local levels, and some members of the general community. Two SA tools were applied in a complementary manner during the study, namely the International Union for Conservation of Nature (IUCN) SA approach and the Community Sustainability Assessment (CSA) approach, developed by the Global Ecovillage Network (GEN).

Experiences of applying sustainability assessment in both developed and developing countries revealed that an overall generic SA tool is not practical. There is a need for a context-specific framework consisting of principles, criteria, generic steps, objectives, indicators, a toolkit and other context-specific components. The SA framework employed in this study had to fit biodiversity conservation conditions in rural areas. The SA process revealed that the MDTP partners were knowledgeable about the conditions of sustainability and threats to biodiversity, while members of the general community were unaware of these threats. Regarding progress towards the sustainability of biodiversity in the study area, the results indicated that current practices are unsustainable, more from the point of view of the socio-ecological components than the socio-cultural and spiritual or the socio-economic components. Consequently, there is a need to raise awareness at the community level and implement action plans to realize changes that support the sustainability of biodiversity in the long-term.

Key components for a participatory SA framework depend on whether a SA is a partial assessment or a full one. The components of a partial SA framework also depend on whether the focus is on reflection and learning or data handling. Hence, the main components of a participatory sustainability assessment framework comprise: a comprehensive vision of sustainable development; goals towards attaining the vision; a participatory process engaging various stakeholders; a toolkit of appropriate SA tools used for various tasks; relevant principles of sustainability assessment; and sustainability-led decision criteria.

There is no blueprint on how to undertake a SA process and no rigid way of integrating participation within the SA processes. The application of a SA requires adaptability and flexibility in specific circumstances. Therefore, the study presents guidelines, key components of a participatory SA process, and highlights the strengths, weaknesses, opportunities and threats for applying a SA for biodiversity conservation in rural areas.

Key words: sustainability assessment, stakeholder participation, environmental assessment, biodiversity conservation, rural areas, sustainability assessment framework.

OPSOMMING

Bewaringsbiodiversiteit is uiters noodsaaklik vir die volgehoue voorsiening van ekostelseldienste ten einde 'n volhoubare lewensbestaan te verseker, veral aan arm plattelandse mense. Die huidige tempo van biodiversiteitsverlies bedreig die mens se oorlewing en moet dus gestuit word deur doeltreffende ingrype. Die implementering van en besluitneming oor sodanige ingrype vereis tydige inligting. Om 'n volhoubaarheidstudie (VS) te onderneem en die inligting binne 'n VS-raamwerk van komponente en doelwitte te struktureer, is 'n doeltreffende manier om besluitnemers by te staan.

'n Doeltreffende VS-raamwerk sal belangrike volhoubaarheidskwessies en -prioriteite in ag neem wat in ooreenstemming is met die heersende beleid- en wetsraamwerk, asook die strewes van die belanghebbendes.

Die ontwikkeling en toepassing van VS'e groei en kom wyer voor in ontwikkelde lande as in ontwikkelende lande. Hierdie studie wou ondersoek instel na hoe VS'e op 'n deelnemende wyse kan plaasvind in die plattelandse gebiede van 'n ontwikkelende land. Die hoofdoelwitte van die studie was: i) die identifisering van sleutelaspekte wat 'n VS-raamwerk doeltreffend maak; ii) maniere om doeltreffende deelname aan VS-prosesse te verseker; iii) 'n ondersoek na die opvattinge van belanghebbendes omtrent die ekostelsel en menslike omstandighede wat vereis word vir die volhoubaarheid van biodiversiteitsbewaring; en iv) die vasstelling van belanghebbendes se opvattinge omtrent die vordering na volhoubaarheid.

Die studie het binne 'n oorgrens-projekgebied in Lesotho plaasgevind. Dié projek staan bekend as die Maloti-Drakensberg-oorgrensprojek (MDOP) en is 'n samewerkingsinisiatief tussen Lesotho en Suid-Afrika om biodiversiteit van wêreldbelang te bewaar. Kwalitatiewe gevallestudies en 'n samestelling van instrumente is gebruik, insluitend 'n

literatuuroorsig, veldwaarnemings, onderhoude met sleutelinformante, groepbesprekings en werksessies om inligting te versamel. Deelnemers aan die studie het bestaan uit MDOP-vennote op nasionale, distriks- en plaaslike vlak, asook sommige lede van die plaaslike gemeenskap. Twee VS-instrumente is op 'n komplementêre wyse ingespan tydens die studie, naamlik die Wêreldbewaringsunie se VS-benadering en die Gemeenskapsvolhoubaarheidstudie, 'n benadering wat ontwikkel is deur die Global Ecovillage-netwerk.

Die ervaring wat opgedoen is in die aanwending van volhoubaarheidstudies in sowel ontwikkelde as ontwikkelende lande dui daarop dat 'n allesomvattende generiese VS-instrument nie prakties haalbaar is nie. Daar is 'n behoefte aan 'n konteksspesifieke raamwerk wat sal bestaan uit beginsels, maatstawwe, generiese stappe, doelwitte, aanwysers, 'n instrumentestel en ander konteksspesifieke komponente.

Die VS-raamwerk wat in hierdie studie aangewend is, moes pas by die biodiversiteitsbewaringstoestande in plattelandse gebiede. Die VS-proses het aangedui dat die MDOP-vennote ingelig was omtrent die voorwaardes vir die volhoubaarheid van en bedreidings vir biodiversiteit, terwyl lede van die plaaslike bevolking onbewus was van sodanige bedreigings.

Wat die vordering na die volhoubaarheid van biodiversiteit in die studiegebied betref, het die uitslae getoon dat die huidige praktyke nie volhoubaar is nie, meer vanuit die oogpunt van die sosio-ekologiese komponente as die sosio-kulturele en geestelike of die sosio-ekonomiese komponente. Gevolglik is dit nodig om op gemeenskapsvlak bewusmaking te bevorder en aksieplanne in werking te stel om verandering teweeg te bring wat op die lang duur die volhoubaarheid van die biodiversiteit sal steun.

Die sleutelkomponente van 'n deelnemende VS-raamwerk sal afhang of die VS 'n gedeeltelike studie of 'n volledige een is. Die komponente van 'n gedeeltelike VS-raamwerk hang ook daarvan af of die fokus op nabetraging en kennis is en of dit op die hantering van inligting is. Die hoofkomponente van 'n deelnemende VS-raamwerk

bestaan dus uit 'n alomvattende visie vir volhoubare ontwikkeling; doelwitte vir die bereiking van die visie; 'n deelnemende proses waarvan verskeie belanghebbendes deel uitmaak; 'n instrumentestel van gepaste VS-instrumente wat vir verskeie take gebruik kan word; toepaslike beginsels vir 'n volhoubaarheidstudie; en, volhoubaarheids-gedrewe besluitnemingsmaatstawwe.

Daar is geen bloudruk oor hoe 'n VS-proses onderneem moet word nie en ook geen vaste manier om deelname aan VS-prosesse te integreer nie. Die toepassing van 'n VS kan in spesifieke omstandighede aanpasbaarheid en buigsaamheid vereis. Die studie bied dus riglyne, die sleutelstadiums van 'n deelnemende VS-proses en identifiseer die sterkpunte, swakpunte, geleenthede en bedreigings vir die toepassing van 'n VS ten opsigte van biodiversiteitsbewaring in plattelandse gebiede.

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LIST OF ACRONYMS AND ABBREVIATIONS

<i>ASSIPAC</i>	Assessing Sustainability of Societal Initiatives and Proposing Agenda for Change
<i>CAPE</i>	Cape Action Plan for Environment
<i>CBD</i>	Convention on Biological Diversity
<i>CBNRM</i>	Community Based Natural Resources Management
<i>CCF(s)</i>	Community Conservation Forum (s)
<i>CEM</i>	Centre for Environmental Management
<i>CITES</i>	Convention on International Trade in Endangered Species of Wild Fauna and Flora
<i>CMBSL</i>	Conserving Mountain Biodiversity in Southern Lesotho
<i>CSA</i>	Community Sustainability Assessment
<i>CSIR</i>	Council for Industrial and Scientific Research
<i>DEAT</i>	Department of Environmental Affairs and Tourism
<i>D/MMCCP</i>	Drakensberg / Maloti Mountains Catchment Conservation Programme
<i>DSC(s)</i>	District Steering Committee (s)
<i>EA</i>	Environmental Assessment
<i>EIA</i>	Environmental Impact Assessment
<i>ESE</i>	Economic, Social and Ecological
<i>EU</i>	European Union
<i>FAO</i>	Food and Agricultural Organization
<i>FNNPE</i>	Federation of Nature and National Parks of Europe
<i>FSC</i>	Forest Stewardship Council
<i>GEF</i>	Global Environmental Facility
<i>GEN</i>	Global Eco-village Network
<i>GEO</i>	Global Environmental Outlook
<i>GIS</i>	Geographic Information Systems
<i>HIV/AIDS</i>	Human Immuno-Deficiency Virus / Acquired Immuno Deficiency Syndrome
<i>IAIA</i>	International Association for Impact Assessment
<i>ICLEI</i>	International Council for Local Environmental Initiatives

<i>IDP</i>	Integrated Development Planning
<i>IDRC</i>	International Development and Research Centre
<i>IEM</i>	Integrated Environmental Management
<i>IFAD</i>	International Fund For Agricultural Development
<i>IIED</i>	International Institute for Environment and Development
<i>IISD</i>	International Institute for Sustainable Development
<i>ISCAM</i>	Integrated Sustainable Cities Assessment Method
<i>IUCN</i>	International Union for Conservation of Nature
<i>IUCN-ROSA</i>	International Union for Conservation of Nature - Regional Office for Southern Africa
<i>JPI</i>	Johannesburg Plan of Implementation
<i>LA21</i>	Local Agenda 21
<i>LCRD</i>	Land Conservation and Research Development Programme
<i>LHWP</i>	Lesotho Highlands Water Project
<i>MA</i>	Millennium Ecosystem Assessment
<i>MATISSE</i>	Methods and Tools for Integrated Sustainability Assessment
<i>MDG(s)</i>	Millennium Development Goal (s)
<i>MDTCA</i>	Maloti Drakensberg Transfrontier and Conservation Area
<i>MDTP</i>	Maloti Drakenberg Transfrontier Project
<i>MMSD</i>	Mining Minerals and Sustainable Development
<i>MoU</i>	Memorandum of Understanding
<i>MRA</i>	Managed Resource Areas
<i>NEMA</i>	National Environmental Management Act
<i>NES</i>	National Environment Secretariat
<i>NGO(s)</i>	Non-Governmental Organization (s)
<i>NEPAD</i>	New Partnership for Africa's Development
<i>NETCAB</i>	Regional Networking and Capacity Building Initiatives for Southern Africa
<i>NSC</i>	National Steering Committee
<i>OECD</i>	Organization for Economic Corporation and Development
<i>ODPM</i>	Office of the Deputy Prime Minister - London
<i>PAGE</i>	Pilot Analysis of Global Ecosystems
<i>PRB</i>	Population Reference Bureau

<i>PRSP</i>	Poverty Reduction Strategy Paper
<i>PSAF</i>	Participatory Sustainability Assessment Framework
<i>RMA</i>	Range Management Areas
<i>RSA</i>	Republic of South Africa
<i>s. a.</i>	sine anno (without date)
<i>SA</i>	Sustainability Assessment
<i>SABONET</i>	Southern African Botanical Network
<i>SADC</i>	Southern African Development Community
<i>SAF</i>	Sustainability Assessment Framework
<i>SAIEA</i>	Southern African Institute for Environmental Assessment
<i>SECO-SUD</i>	Service for Environmental Conservation of Biodiversity and for Sustainable Development
<i>SEA</i>	Strategic Environmental Assessment
<i>SIA</i>	Social Impact Assessment
<i>SoE</i>	State of the Environment
<i>SSP</i>	Solution Spaces for Decision making
<i>TBL</i>	Triple Bottom Line
<i>TFCA</i>	Transfrontier Conservation Area
<i>UN</i>	United Nations
<i>UNCCD</i>	United Nations Convention to Combat Desertification
<i>UNDP</i>	United Nations Development Programme
<i>UNEP</i>	United Nations Environment Programme
<i>UNFCCC</i>	United Nations Framework Convention on Climate Change
<i>USAID</i>	United States Agency for International Development
<i>US\$</i>	United States Dollar
<i>WCED</i>	World Commission on Environment and Development
<i>WHC</i>	World Heritage Convention
<i>WRI</i>	World Resources Institute
<i>WSSD</i>	World Summit Sustainable Development

CHAPTER ONE

INTRODUCTION

1 OVERVIEW

The importance of conserving biodiversity to sustain supply of ecosystem services for supporting livelihoods is a prevailing theme worldwide. However, the task of ensuring sustainability of biodiversity and associated ecosystem services remains a challenge due to factors such as poverty, greed, and ignorance. Consequently, delivery of ecosystem services such as food, water, shelter, clothing and air is threatened by human activity globally (Federation of Nature and National Parks of Europe (FNNPE), 1993; United Nations Development Programme (UNDP) *et al.*, 2000; UNDP *et al.*, 2003; Millennium Ecosystem Assessment (MA), 2005). The significance of the threats is internationally recognized as captured by the following statement by the United Nations Secretary General Ban Ki-Moon (United Nations Environmental Programme (UNEP), 2008:3): *“As both GEO-4 and Millennium Ecosystem Assessment point out, 60 percent of the world’s ecosystem services are being degraded or used unsustainably. The consequences include increased poverty and ill-health for billions of people and increased potential conflict among communities and nations.”*

Humanity will pay a huge price if interventions to manage current unsustainable trends of biodiversity degradation are disregarded. Degradation of the capacity of biodiversity to deliver ecosystem services results from several trends including unprecedented demographic and market pressures

coupled with unsustainable consumption patterns (UNEP, 2007a). Human population has increased four times from 1.5 billion in 1900 to more than 6 billion in 2000. The increase is accompanied by escalating consumption of natural resources up to sixteen times (UNDP, 2004). Population is projected to increase even more (although slower than in the past) with most of the future increase (90% plus) in developing countries where the population will rise from the current 5.3 billion to 7.8 billion by 2050 (Population Reference Bureau (PRB), 2006). Energy and raw materials continue to be consumed unsustainably, producing wastes and emissions that further pollute and deteriorate already overexploited natural systems.

While consumption levels are increasing, some aspects of human well-being continue to worsen due to biodiversity degradation, especially in developing countries. This is happening in spite of increasing attention towards biodiversity conservation since the Convention on Biological Diversity (CBD) was established in 1992 (Borrini-Feyerabend *et al.*, 2004). For instance, currently 59% of people in less developed countries (3.12 billion) are living in poverty, i.e. under US\$2 per day. The majority of the poor lives in rural areas where they depend heavily on natural resources for livelihoods. Conversely, the natural resource base and associated ecosystem services where the poor derive their sustenance are continually deteriorating. This presents a challenge to meeting international obligations such as the Millennium Development Goal (MDG) of poverty reduction. The following statement by the UNEP executive director highlights the seriousness of current ecosystem decline and the need to secure viability of life support systems: *"...world ecosystems are in decline or even degraded to an extent that we can no longer rely on their services. These services include climate regulation, clean air and water, fertile land and productive fisheries. They are the services that help to keep diseases and pests in check, that provide valuable new medicines and protect communities from natural disasters"* (UNEP, 2007a:4).

The escalating degradation of biodiversity and its associated ecosystem services is a global predicament (UNEP, 2007b) and has received attention as revealed by several global analyses including the Pilot Analysis of Global Ecosystems (PAGE) (Burke *et al.*, 2000; Matthews *et al.*, 2000; Ravenga *et al.*, 2000; White *et al.*, 2000; Wood *et al.*, 2000); Wellbeing of Nations (Prescott-Allen, 2001); World Resources (UNDP *et al.*, 2000; 2003; World Resources Institute (WRI) *et al.*, 2005) and the Millennium Ecosystem Assessment (MA, 2005). For example, the Wellbeing of Nations Assessment (Prescott-Allen, 2001) revealed that two thirds of the world population lives in countries whose human well-being was rated as “poor” and about half of Africa is occupied by countries whose ecosystem well-being was rated as “poor”. An analysis combining both human and ecosystem well-being showed that no countries, worldwide, have achieved sustainability.

Measures towards sustainability are required to sustain delivery of ecosystem services to profit both human and ecosystem well-being in the short and long-term (Ashley & Carney, 1999; Mainka *et al.*, 2005). Decision makers need timely information to design, implement and evaluate interventions aimed at sustainable use of ecosystem services from biodiversity in an integrated manner. Sustainability Assessment (SA) is among major tools that are useful for measuring and evaluating sustainability for various purposes. Hence the purpose of the study is to explore how SA can be applied in a participatory manner, thus providing a tool to aid decision making towards achieving sustainability of biodiversity in rural areas in the Maloti Drakensberg Transfrontier Project (MDTP) area in Lesotho.

2 INTERNATIONAL INITIATIVES TOWARDS BIODIVERSITY CONSERVATION

It is recognized that the sustenance of human life depends on services supplied by a well-functioning diversity of ecosystems as demonstrated by international initiatives and interventions implemented since the early 1970s. Since then, increasing attention has been given to the significance of biodiversity loss and its implications for sustainable development. Conservation and sustainable use of biodiversity¹ was first identified as a priority at the United Nations (UN) Conference on Human Environment in Stockholm in 1972. The paramount importance of biodiversity is attested to by the formulation and adoption of a number of international legal instruments. In 1971, the Ramsar Convention on Wetlands came into place to protect biologically rich but undervalued wetland ecosystems. This was followed by the Convention for the Protection of the World Cultural and Natural Heritage or the World Heritage Convention (WHC) (1972), which deals with the identification of sites of outstanding universal value, and provides support for their protection and management. Then in 1979, a legally binding international treaty, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1979) was developed to regulate trade in plant and animal species threatened with extinction. This convention acknowledges the value of wild fauna and flora for aesthetics, science, culture, recreation and the economy. In the same year (1979), the Convention on Migratory Species, also known as the Bonn Convention 1979, was formulated to coordinate regional and global efforts to protect some migratory species, including birds, dolphins and marine turtles. The UN Framework Convention on Climate Change (UNFCCC) was negotiated in 1992 to address predicted environmental damage, with the aim of dealing with the impacts of climate change. In 1994, the UN Convention to Combat

¹ The Convention on Biological Diversity defines biodiversity as “*the variability among living organisms from all sources including 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*” (CBD, 1992:convention text).

Desertification (UNCCD) was formulated as a comprehensive approach to reducing desertification and drought.

These initiatives are informed by past experiences, which give helpful lessons on the interconnections between biodiversity, ecosystem services and human well-being (Johnson *et al.*, 2003; Borrini-Feyerabend *et al.*, 2004). The conservation and sustainable use of biodiversity contributes positively to poverty reduction, human health, equity and security. On the other hand, the unsustainable use of biodiversity adversely affects human well-being (UNDP *et al.*, 2003; Fischer *et al.*, 2005; MA, 2005). International policy towards biodiversity conservation is rooted within the sustainable development agenda whose essence is to manage and improve human well-being for current generations in a way that cares for ecosystems and considers future generations (World Commission for Environment and Development (WCED), 1987). Examples of some of these policies, in addition to the ones mentioned earlier in this section, include:

- The CBD that recognizes the intrinsic value of biodiversity as well as its ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values, and calls for biodiversity conservation. The CBD has also formulated a document on principles and guidelines for the sustainable use of biodiversity known as Addis Ababa principles (CBD, 2004).
- The World Summit on Sustainable Development (WSSD) and its Johannesburg Plan of Implementation (JPI), which emphasize the importance of reducing the current rate of biodiversity loss by 2010.
- The MDGs, which has environmental sustainability as one of its goals.
- Poverty Reduction Strategy Papers (PRSPs) in various countries, which highlight measures aimed at the integration of biodiversity and poverty, although the level of detail differs from country to country.

Progress on achievements related to these policies needs to be integrated and assessed to guide decision-making of global, regional, national and local stakeholders. However, there are challenges for developing countries to report on advancements related to sustainability issues due to a lack of capacity and reliable data, as well as the absence of proper monitoring mechanisms (UNEP, 2004a; 2004b). One way of addressing these challenges is through the use of sustainability assessment² frameworks (SAFs). Sustainability assessment frameworks consist of objectives and components, which help to structure information for guiding decision-makers when assessing progress towards sustainable development (Guijt & Moiseev, 2001a; Pope *et al.*, 2004). A variety of stakeholders need to be involved in identifying the aims and constituents of a SAF so that the decision-making processes address key sustainability issues and priorities (Dalal-Clayton & Bass, 2002; Bell & Morse, 2003).

3 SUSTAINABILITY ASSESSMENT IN A SOUTHERN AFRICAN CONTEXT

Sustainability Assessment is a result of the latest scholarly reconsideration of impact assessment processes (Pope *et al.*, 2004; Gibson *et al.*, 2005). It is a member within the family of environmental assessment (EA), along with Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA). It is a broader EA tool, focusing on the integration of various sustainable development issues (Sadler, 1999; Buselich, 2002; Gibson, 2002) as opposed to a project specific or sector-based agenda. Turnpenny (in press:2) lists the following as key features of SA:

- *“ integrates environmental, social, and economic aspects of an issue*
- *is conducted throughout and in parallel with policy process*
- *is infused with sustainability worldview rather aimed at minimizing impacts of an unsustainable development*
- *specifies clear rules for making trade-offs*

² Assessment is a process for gathering, analyzing and evaluating information (Guijt & Moiseev, 2001a).

- *involves creating context-specific definitions of sustainable development through participatory processes.* ”

There is a proliferation of sustainability assessment methodologies in Europe, North America and Australia, while in Asia and Africa this is not the case. The most notable initiative towards sustainability assessment in Southern Africa was a meeting held by the Council for Scientific and Industrial Research (CSIR) and the Southern African Institute for Environmental Assessment (SAIEA) in March 2004 to discuss appropriate approaches to best guide sustainable development in the Southern African context. From the discussions, it was concluded that sustainability assessments in Southern Africa needed to reflect the main priorities of the region, especially combating poverty, dealing with the Human Immunodeficiency Virus / Acquired Immuno - Deficiency Syndrome (HIV/AIDS) and securing economic growth and jobs (Dalal-Clayton & Sadler, 2004). This regional context provides a foundation and guidelines along which to explore application of a participatory SA process and identify key components of a framework for biodiversity conservation in the MDTP area in Lesotho.

International experience reveals that six criteria should be met for sustainability assessments to serve as mechanisms of transformation in sustainable development. Sustainability assessments: i) should be undertaken within a structured framework; ii) should assess proposed and new initiatives at all levels of decision-making; iii) must address existing practices across sectors; iv) need to consider the prevailing policy and legislative paradigm; v) should guide all decisions with the potential to impact on patterns of production and consumption, governance and settlement; and vi) should include all sectors of society (Pope *et al.*, 2004). Furthermore, the design of a SAF requires a clear vision of what sustainability means; and the vision needs to be translated into context specific sustainability criteria and inform sustainability priorities (Guijt & Moiseev, 2001a; Gibson *et al.*, 2005).

4 SUSTAINABILITY PRIORITIES AND MEASURES FOR BIODIVERSITY CONSERVATION IN LESOTHO

Sustainability priorities for Lesotho are similar to the regional priorities of combating poverty, tackling HIV/AIDS and ensuring economic growth. Biodiversity conservation is meant to contribute towards addressing these priorities. Consequently, several responses were established to curb the loss of biodiversity as described by the Country Report on Sustainable Development (National Environment Secretariat (NES), 2002):

- *Legal and policy measures:* The Environment Act of 2001, the Environment Policy and National Environment Action Plan provide for conservation of biodiversity and development of monitoring mechanisms.
- *National Biodiversity projects and programs:* Several projects aimed at biodiversity conservation have been initiated at the national level, such as the Conserving Mountain Biodiversity in Southern Lesotho (CMBSL). The Lesotho Highlands Water Project (LHWP) has developed two protected areas in Bokong and Tsehlanyane, as well as an ex-situ area through a botanical garden in Katse. Monitoring activities are focused on biological resources and not on the ecosystem services coming from these resources.
- *Regional Biodiversity Projects or Programs:* Lesotho is also part of several regional biodiversity projects such as the Southern African Botanical Network (SABONET), which deals with capacity building in taxonomy and computerized record keeping of floristic specimens within their herbariums in the country. Through SABONET, the Plant Red Data List for Southern Africa has been published. Lesotho is also part of the Southern African Biodiversity Support Programme, which focuses on improving the availability and accessibility of biodiversity information and its application to planning and management; capacity building; the facilitation of the integration of effective practices; and achieving cross-

- sectoral national and regional institutional cooperation in biodiversity conservation and sustainable use.
- In addition to the above initiatives, a State of the Environment (SoE) reports in Lesotho for 1997 (NES, 1999) and 2002 (NES, 2004) provide information on the status of biodiversity and related issues. But SoE are not for decision-making at community levels. Application of SA in a participatory manner meets the information needs of stakeholders by involving them in the process of providing information for decision-making, not only to national and international stakeholders but also to local communities.
 - Measures to promote sustainable biodiversity conservation are also embedded within key national documents, such as the country's Vision 2020, Poverty Reduction Strategy Paper and Millennium Development Goals. The most recent biodiversity conservation initiative is the MDTP that ran from 2003 to 2007. MDTP is ingrained within international, regional and national initiatives towards conservation and sustainable use of biodiversity. Hence, through SA stakeholders within multiple levels of governance, as well as at different institutions are enabled to make integrated decisions on progress towards sustainable development in the MDTP area.

The exploration of SA application and subsequent identification of key components of a participatory sustainability assessment framework (PSAF), builds on the initiatives mentioned above. It also helps identify the sustainability issues of different stakeholders so that biodiversity conservation efforts are implemented harmoniously.

5 THE MALOTI-DRAKENSBERG TRANSFRONTIER PROJECT FOR BIODIVERSITY CONSERVATION AND DEVELOPMENT

The Maloti-Drakensberg mountain area has distinct landscapes and contains biodiversity of global significance. It is very rich in species and endemism containing at least 2,153 plant species, 295 bird species, 60 mammal species, 49 species of reptiles and 26 species of amphibians. However, this exceptional biodiversity is threatened by livestock grazing, invading alien species, crop cultivation on steep slopes, uncontrolled burning, and human settlement. The sustainability of human well-being and ecosystem services in the Maloti-Drakensberg mountain area necessitates the implementation of strategic sustainability responses. Consequently, the Republic of South Africa (RSA) and the Kingdom of Lesotho (Lesotho) jointly implemented a five-year MDTP from 2003-2007 through funding by the Global Environmental Facility (GEF). The MDTP aims to conserve the globally significant biodiversity in the area and promote community development through integrated nature-based tourism. Maximum participation of local communities and other stakeholders underpins the project (MDTP, 2007a).

Performance and progress towards a desired change in sustainability goals for both human well-being and ecosystem services within the MDTP requires the analysis of activities and their location, duration, timing and actors. The implementation of sustainable development strategies requires information coming from measurement and analysis. The values of stakeholders form the basis for characterizing appropriate and effective measurement of trends in ecosystem services thus necessitating public participation (Bell and Morse, 2003; Caffyn & Jobbins, 2003; Herath, 2004; Bell & Morse, 2005). Therefore, there is a need to identify context-specific components of a PSAF for human well being and ecosystem services for the MDTP area, to guide planning and decision-making towards sustainable development. The aim of the study,

questions, objectives, justification and value are described in the sections below.

6 AIM OF THE STUDY AND QUESTIONS

The overall aim of the study was to explore how to effectively apply SA in the context of biodiversity conservation in rural areas, in a participatory manner. The associated overriding research question³ inquires: How can a participatory SA process be effectively applied for biodiversity conservation in rural areas? Four questions were formulated to allow adequate examination of the overall aim of the study and respond to the overriding research question:

- What fundamental components should be considered to make a SAF for biodiversity conservation effective?
- How can participation be effectively incorporated into an SA process?
- What are stakeholders' perceptions of the ecosystem and human conditions required for the sustainability of biodiversity conservation?
- What are stakeholders' perceptions of progress towards sustainable development in MDTP area?

7 STUDY OBJECTIVES

In line with the aim and questions above, the practical objectives of the study were to:

- Identify key components of a PSAF to guide stakeholders when making decisions on the sustainable use of biodiversity within the MDTP area.
- Engage stakeholders in a debate to allow for reflection and learning with regard to sustainability issues in the study area that affect biodiversity conservation.

³ This study uses research questions instead of hypothesis because it is an explorative investigation.

- Facilitate self-assessment or self-audit of sustainability conditions within rural areas where MDTP was operating.
- Identify sustainability issues on which awareness needs to be raised and priorities to be addressed to ensure that the grasslands, which are rich in biodiversity, are used in a sustainable manner.

The theoretical objectives of the study were to:

- Contribute lessons to the emerging field of SA from a case study where trans-boundary biodiversity conservation is the focus.
- Refine and extend existing knowledge of how to integrate stakeholder input into the practice of SA.

8 JUSTIFICATION AND VALUE OF STUDY

The researcher became intrigued with PSAFs as a result of consultancy assignments on EIA and public participation in biodiversity conservation projects in Lesotho and the Southern African Development Community (SADC) region. In particular, two consultancies conducted for two biodiversity conservation projects in Lesotho fueled the interest, namely: the CMBSL and the MDTP. A gradual and growing realization of the importance of biodiversity and its ecosystem services in sustainable development awakened more interest. This interest was further influenced by the Calabash project undertaken by SAIEA to integrate participation into environmental decision making in Southern Africa. The researcher was part of the team that conducted the situational analysis on participation in the SADC region for SAIEA. The opportunity to explore SA within the MDTP area presented itself as a result of consultancy studies commissioned by the MDTP, where the researcher was part of the study team.

The investigation into key components required for an effective PSAF for the MDTP also provided a well-timed opportunity to bring insights into links between biodiversity and issues such as combating poverty, HIV/AIDS, and securing economic growth and employment in rural areas. It was a favorable context to further delineate the requirements of participatory SA and to shed light on requirements for measuring, evaluating and analyzing sustainability. Consequently, the study is of value to environmental assessment practitioners, especially those involved in SA processes, academics, development agencies, policy makers, politicians, civil society, government officials and local communities. The study is also useful to various institutions including government, international development agencies, non-governmental organizations and community based organizations. The benefits of this study include:

- Giving guidance for various activities including: strategic planning by local authorities, action plans and management plans, impact analysis of the MDTP activities and monitoring and evaluation.
- Provision of lessons for MDTP stakeholders to conserve biodiversity in their area; aid in facilitating reflection and learning and also give insights into other similar initiatives elsewhere in the co-management of natural resources, especially in biodiversity conservation. The SA process allows stakeholders to identify issues requiring immediate attention, raise awareness and facilitate reflection on the sustainability issues of the MDTP area.

This study also contributes to the practice of sustainability assessments in terms of five areas identified in Dalal-Clayton & Sadler (2004):

- *Concepts and definitions*: sheds light on the meaning of sustainability in the context of the MDTP, compared with definitions elsewhere;

- *Trends and developments*: brings insights of experiences from the MDTP study, which can inform SA application in other in other contexts;
- *Procedures and methodologies*: shares the process followed for the MDTP with SA practitioners elsewhere;
- *Guidance and case studies*: draws lessons learned and practice in SA undertaken within the MDTP area;
- *Future directions*: suggests how the process and practice of participatory SA can be improved.

This study addresses makes a four-fold original contribution to academic investigation in terms of:

- *Sustainability Assessment tools applied*: The combination of two SA tools, the International Union for Conservation of Nature (IUCN) methodology and the community sustainability assessment in one SA process provides new lessons in the evolving field of SA.
- *Examining an unknown phenomena of SA for biodiversity conservation in Lesotho rural areas*: While there is a proliferation of sustainability assessment methodologies being developed in others areas of the world, this is not happening in Southern Africa, which includes Lesotho. This study provides a perspective from a Southern Africa point of view.
- *Investigating the unanticipated*: By adopting a participatory approach where stakeholders made decisions on the type of a SAF that would be effective and appropriate for different levels of governance, the study explored an unanticipated route where the researcher could not anticipate the process of how to effectively apply SA. For example, stakeholders decided to focus on reflection and learning at the community level.
- *Producing a new outcome*: Majority of SA tools and approaches are technical and few paying minimal attention to the integration of participation (Lee, 2006). Similarly, latest research on participation in

environmental assessments in Southern Africa focuses on SEA and EIA not SA (SAIEA, 2003a; 2003c; 2004; 2005a; 2005b; 2005c). This study results in new insights to complement ideas on incorporation of participation in SA towards sustainable development of biodiversity in a trans-boundary project in a rural context.

9 ORGANIZATION OF CHAPTERS

This study investigates how to undertake SA effectively for biodiversity conservation in rural areas using the MDTP area in Lesotho as a case study. The study material is arranged in seven chapters:

- Chapter One deals with the background and statement of the problem, the aim of the study, main question and related sub-questions as well as the practical and theoretical objectives. It also presents the contribution of the study to new knowledge, its value and its justification.
- Chapter Two highlights the historical and theoretical background that gave rise to the field of SA. It outlines the relevance of SA to biodiversity conservation.
- Chapter Three is devoted to a review of the literature on examples of relevant SA approaches, initiatives and frameworks and identifies lessons for the application of biodiversity conservation in rural areas.
- Chapter Four describes the methodology adopted to achieve the research objectives. It provides the background to the study, overall design, population and sampling. It also outlines data sources and steps followed in answering study questions.
- Chapter Five analyses policy issues and priorities for biodiversity conservation. It scrutinizes relevant international and national policy frameworks, establishes priorities and determines implications for SA.
- Chapter Six is devoted to describing the background of the case study by giving specific information about the MDTP. It also presents the views of

stakeholders regarding the application of SA in addressing biodiversity conservation issues in the MDTP context.

- Chapter Seven discusses the views of stakeholders on the application of SA and also concludes by presenting lessons learned and guidelines for the application of SA for biodiversity conservation in rural areas.

CHAPTER TWO

AN OVERVIEW OF HISTORICAL AND THEORETICAL TRENDS OF SUSTAINABILITY ASSESSMENT

1 INTRODUCTION

The significance of effective biodiversity-inclusive environmental assessment is internationally recognized (SAIEA, 2003b; International Association for Impact Assessment (IAIA), 2005; CBD, 2006). For instance, the CBD (2006) recently developed a document called “Voluntary Guidelines on Biodiversity Inclusive Impact Assessment”. These guidelines focus on the application of EIA and SEA to address biodiversity issues in impact assessments. Also, IAIA launched a Capacity Building Project for Biodiversity in Impact Assessment in 2005 (SAIEA, (sino anno (s.a.)).

Major international conventions dealing with biodiversity management such as the CBD (1992), the Ramsar Convention on Wetlands (1971) and the Bonn Convention otherwise known as the Convention on the Conservation of Migratory Species of Wild Animals (1979), distinguish EA tools as being valuable in conservation, sustainable use and fair sharing of benefits from biodiversity. As highlighted in the previous chapter, SA is a new and evolving tool compared to other EA tools such as EIA and SEA. Therefore, procedures on how to use EIA and SEA to assess development impacts on biodiversity conservation have been developed while this is a new field in the case of SA. However, the contribution of SA to sustainable development is receiving increasing attention (Guijt & Moiseev, 2001a; Buselich, 2002; Bell & Morse, 2003; UNEP, 2003;

Dalal-Clayton & Sadler, 2004; Pope *et al.*, 2004; UNEP, 2004a; 2004b; Bell & Morse, 2005; Gibson *et al.*, 2005; Lee, 2006; UNEP, 2006; 2007b). The literature gives several names for SA, such as integrated assessment (UNEP, 2004b); sustainability analysis (Dalal-Clayton & Bass, 2002); sustainability appraisal (Dalal-Clayton & Sadler, 2004; Office of the Deputy Prime Minister – London (ODPM), 2004a; 2004b); and sustainability impact assessment (Dalal-Clayton & Sadler, 2004; UNEP, 2006). The common denominator that runs through these different names is a holistic approach, which integrates the social, economic and ecological dimensions of sustainable development. This differs from EIA and SEA, which emphasize environmental issues over economic and social issues. Sustainability assessment is defined and compared to other environmental assessment tools within later sections of this chapter.

Sustainability assessment is regarded as the most challenging tool along a continuum of current integrative approaches of EA (International Institute for Sustainable Development (IISD), 1997; Buselich, 2002; Dalal-Clayton & Sadler, 2004; UNEP, 2006). The growing interest, development and application of SA originated over two decades ago in response to international calls for the design and application of an integrated approach to implement and assess sustainable development (WCED, 1987; IISD, 1997). Furthermore, the Johannesburg Plan of Implementation reiterated the need for a *“holistic and inter-sectoral approach”* to implement sustainable development (WSSD, 2002).

The aim of this chapter is to give an overview of the historical and theoretical precedents of SA. It is not a comprehensive review, but highlights the main historical themes and concepts to inform the identification of key components of a PSAF for biodiversity conservation in rural areas. An analysis of the historical and theoretical origins of SA is significant for a number of reasons: i) the application of the PSAF requires that its users appreciate the background and key perspectives underlying SA; ii) it gives insights into the definitions, background and ideas affecting the PSAF; and iii) it provides ideas on elements

of effective approaches relevant to addressing biodiversity conservation issues. The rest of the chapter is divided into three main sections. Section one deals with the evolution of EA in addressing sustainability issues. Section two concentrates on the use and benefits of frameworks in SA. The third section provides concluding remarks and their implications for the rest of the study.

2 ENVIRONMENTAL ASSESSMENT AND SUSTAINABILITY ASSESSMENT

This section focuses on the evolution of EA in addressing sustainability issues. Environmental Assessment is a term for processes that promote and draw attention to environmental considerations in the planning and implementation of significant development initiatives (Department of Environmental Affairs and Tourism (DEAT), 2002; Brownlie, 2005; CBD, 2006). Impact assessment tools such as EIA and SEA, and most recently SA, are applied by diverse stakeholders for various purposes and in different settings. These tools are used by governments, development agencies, civil society, and the private sector as well as by local communities. Strategic Environmental Assessment is applied to plans, programs and policies globally, regionally and nationally. Environmental Impact Assessment and its variants, such as health impact assessment, risk impact assessment and social impact assessment are used for project level decision-making. Environmental Impact Assessment and SEA focus mostly on specific sustainability issues, especially environmental considerations. Sustainability assessment adopts a holistic approach and deals with interactions and conflicts between environmental, social and economic aspects in one framework (UNEP, 2003). It is equally applicable to policies, plans, programs, projects and existing activities.

Environmental Assessment⁴ has greatly influenced SA theory because its relationship with sustainability spans over three decades. Moreover, EA has two main strengths as a basis for SA: it is able to integrate environmental concerns into decision-making processes and it can also be modified to include broader sustainability concerns in different contexts (Gibson, 2002; Gibson *et al.*, 2005). Understanding how the EA field has evolved is therefore fundamental in determining the conditions and aspects required for an effective PSAF for biodiversity conservation in rural areas. The next section is, therefore, devoted to outlining the overall trend within the EA field, the related core stages and their main characteristics.

2.1 Core stages in the evolution of environmental assessment

Four overlapping stages can be distinguished from the conception of EA in the 1970s to the time of the development of SA procedures. The early stage was characterized by a narrow emphasis on biophysical issues, focusing mostly on single disciplines. This stage evolved to the current advanced stage, where the application of EA processes has broadened from being project-based, to being strategic and multidisciplinary (Gibson *et al.*, 2005; UNEP, 2006).

The first stage of the EA evolution began in the late 1960s. It focused on pollution control measures in prevailing local problems such as water, air or soil pollution. The approach involved reactive and technical decisions made for pollution prevention and mitigation by government officials and polluters. The second stage occurred between the 1970s and 1980s, when many countries formulated requirements for EIA at the project level. It was characterized by the application of proactive impact assessment processes for project approval

⁴ This study recognizes that Environmental Assessment is not the only discipline which influenced SA theory. This study concentrates on the EA field for four main reasons: i) EA has over three decades having a relationship with sustainability issues; ii) Suggestions for SA entry point advocate EA and integrated planning; iii) Most developing countries including Lesotho have EA legislation; EA practitioners in recent years are currently considering how best to use EIA and SEA as entry points for SA application. Therefore, within the EA field, SA is the youngest tool.

and licensing. Though this was a proactive approach, the initial emphasis on impact identification and mitigation was strongly motivated by mainly biophysical concerns, with little emphasis on the social or “brown” environment. Although multiple disciplines were involved, processes were primarily technical and hardly involved public views in decision-making (Pope *et al.*, 2004; Gibson *et al.*, 2005). In the case of Lesotho, EA legislation was tabled in 2001 through the Environmental Act. However, compliance with EA requirements is still voluntary, because the law is not yet operational since the Act is currently under revision.

During the third stage of EA evolution, which occurred in the mid to late 1980s, EA processes began to incorporate broader environmental issues entailing biophysical and socio-economic issues, as well as the assessment of alternatives to determine the best options environmentally, socially and economically. The public was given access and a voice during decision-making processes. Several assessment tools, mostly EIA variants such as social impact assessment, health assessment, technology assessment, risk assessment and biodiversity assessment, were also developed during this period. Since EIA is typically applied at the project level, it is applied late in the decision-making process. SEA was created as another tool to facilitate the incorporation of environmental considerations at higher decision-making levels such as at the level of policies, plans and programs (Therivel *et al.*, 1992; Sadler & Verheem, 1996; Therivel & Partidario, 1996; Partidario, 1999; Sadler, 1999; Liou *et al.*, 2006). Towards the end of this stage, the WCED (Brundtland) Report produced in 1987, fuelled an interest in the integration of environmental, social and economic issues at the strategic level (Pope *et al.*, 2004; Gibson *et al.*, 2005; UNEP, 2006). As a result, SEA gained more momentum as an EA tool. This international trend in EA evolution is different in Lesotho as until now EIA, and not SEA, is the only EA tool to be applied, as mandated by the Environment Act of 2001.

The fourth stage of EA evolution commenced around the early 1990s. Growing interest focused on integrated assessment, planning and decision-making to achieve sustainable development. More recognition of the role and application of EIA, the need for improved SEA processes and additional integrative processes were influenced by several international initiatives, especially the 1992 Rio summit, Agenda 21 and the CBD. The main features of the fourth stage were integrated planning and decision-making for sustainability with public empowerment; addressing uncertainties through precaution and adaptive management; and also going beyond the minimization of impacts to expecting and enhancing positive sustainability outcomes. In 2002, the WSSD also recommended an integrated approach through the JPI. The emphasis was on using a holistic and inter-sectoral approach towards tackling environmental, developmental and poverty issues to realize the MDGs. This call for integrated approaches to address the requirements of sustainable development resulted in the proliferation of diverse SA approaches (IISD, 1997; Pope *et al.*, 2004; Gibson *et al.*, 2005; Milner *et al.*, 2005; UNEP, 2006; Nooteboom, 2007). In line with this international call, the MDTP commissioned the adoption of an integrated and holistic approach to implementing biodiversity conservation interventions in rural areas in Lesotho. This necessitated exploration of SA and investigation on key components of a PSAF to address the social, economic and environmental aspects of biodiversity conservation holistically. This is the focus of this study.

The four stages discussed above portray how impact assessment moved from a narrow biophysical focus to multi-disciplinary and comprehensive approaches in addressing the sustainability agenda. The overlapping trends in the evolution of EA resulted in the development of various tools, the most dominant being EIA and SEA and recently SA. Table 2.1 compares these tools by outlining their application, context, emphasis, formal use and procedures for impact prediction.

Table 2.1: Comparison of the three main environmental assessment tools

Aspect	EA tools		
	EIA	SEA	SA
Level of Application	Project level for potential significant environmental impacts.	Strategic level for policies, plans and programs (PPP) with potentially significant environmental impacts.	Project and strategic level including current activities. For initiatives such as legislation, regulations, policies, plans, programs, projects, existing activities with potentially significant sustainability impacts.
Context	Environmental policy.	Environmental policy.	Sustainability policy or vision for sustainable development.
Emphasis	Emphasis on biophysical issues addressed; as well as locally relevant socio-economic issues.	Emphasis on environmental impacts on biophysical aspects complemented by socio-economic issues at regional, national and international levels based on scale of PPP.	Sustainability issues investigated at suitable levels including local, regional, national or international. Goes beyond impact minimization to enduring positive gains. Addresses interdependencies between the social, economic and environmental dimensions of sustainability.
Formal use	Legal requirement for most governments, development agencies and civil society.	Legal requirement in a few governments, under testing in most places.	Introduced mostly in developed countries and development agencies.
Procedure for impact prediction	Range of quantitative procedures.	Qualitative procedures.	Under research; mostly use sustainability indicators.

Sources: Buselich, 2002; Pope *et al.*, 2004; Gibson *et al.*, 2005; CBD, 2006; UNEP, 2006.

The features of the three main SA approaches compared in Table 2.1 reveal that amongst environmental assessment tools, SA is more suitable than either EIA or SEA in addressing biodiversity conservation issues in the rural areas of Lesotho. Because SA is applicable beyond the proposed undertakings (projects, plans, policies, programs) and includes existing activities, its application in Lesotho is more advantageous for, amongst others, the following reasons: i) the sustainability of biodiversity is currently threatened by existing activities, as opposed to proposed initiatives; ii) activities in rural areas need to be aligned with Lesotho's vision for sustainable development; iii) sustainability issues affecting rural areas have implications at different levels of governance, from local to international; and iv) the Lesotho government has obligations with regard to reporting to international and regional bodies, which mostly use indicators. On the other hand, experience and practice of SA in developing countries is limited (Dalal-Clayton & Sadler, 2004). In the case of Lesotho it can be regarded as being non-existent. This study thus explores the application of SA by identifying key components of a PSAF for biodiversity conservation in the rural areas of Lesotho.

While the application of either EIA or SEA is inadequate in addressing the sustainability problems of biodiversity conservation in rural areas, their long history in sustainability provides essential lessons on how to design effective SA processes. These lessons emanate from over 30 years of EA application and are examined in the next section.

2.2 Aspects of effective environmental assessment processes

Gibson *et al.* (2005) categorize the main elements for the effective impact assessment into substantive and process aspects. These elements are also emphasized by various authors including IISD (1997), Buselich (2002), Dalal-Clayton & Bass (2002), Dalal-Clayton & Sadler (2004), Pope *et al.* (2004), Lee

(2006) and UNEP (2006). According to these authors, substantive aspects emerging from EA practice demand that SA should:

- be founded upon comprehensive sustainability objectives that consider both socio-economic as well as biophysical issues, adaptation of generic sustainability-led decision criteria and trade-off rules, to local conditions and context;
- be applicable to existing and proposed initiatives at all levels of decision-making, all sectors of society and their practices in both the long term and the short term;
- emphasize and address the most significant existing and proposed practices and initiatives at the strategic and local levels and connect the two levels, ensuring maximum net benefits;
- formulate guidelines for decision-making authorities and development proponents regarding assessment obligations prior to planning, to align motivations with sustainability requirements;
- be applied, using various appropriate SA tools, to existing projects, new projects, plans, policies and programs;
- go beyond the minimization of adverse impacts and identify ways to achieve and enhance multiple and mutually supportive positive outcomes; also opt for alternatives that have the greatest overall benefits;
- adopt a precautionary approach to addressing significant uncertainties and knowledge limitations;
- ensure compliance by being written into law for process requirements, decisions, terms and conditions of approval, monitoring and implementation, adopting the full life-cycle of assessed initiatives and facilitating efficient implementation.

Having looked at the substantive requirements, other SA authors (IISD, 1997; Buselich, 2002; Dalal-Clayton & Bass, 2002; Dalal-Clayton & Sadler, 2004; Pope *et al.*, 2004; Lee, 2006; UNEP, 2006) also concur with Gibson *et al.* (2005) that the processes of an effective SA should be:

- integrated into a more comprehensive framework that connects assessment at project levels with the ones at strategic levels.
- transparent, open and incorporate effective participation of stakeholders, including local communities and others with knowledge and concerns regarding the conditions under assessment; also consider that diverse interests are represented, including those of future generations.
- adaptive and consider the utilization of adaptive design, continuous learning and adaptive implementation.

The above substantive and process aspects provide a strong foundation for devising an effective SA framework for biodiversity conservation in rural areas. While the value of lessons from the history of EA on effective SA processes is not debatable, EA processes also have shortcomings, which have been inherited in some SA approaches. These shortcomings need to be borne in mind when investigating mechanisms of applying SA effectively and are examined in the next section.

2.3 Characteristics of main sustainability assessment approaches

Sustainability assessment approaches in the literature are classified in several ways (De Ridder *et al.*, 2007; Ness *et al.*, 2007), according to their uses, conceptual origins or sphere of application. They can be used retrospectively to measure progress towards sustainable development or prospectively, to assess the sustainability of a proposed undertaking (for instance in Rotmans *et al.*, 2000; Krajnc & Glavic, 2005; Venturelli & Galli, 2006; Yin *et al.*, 2007; Hanusch & Glasson, 2008 and Moles *et al.*, 2008,). Their conceptual origins are related

to EA (for example Pope *et al.*, 2004; Hacking & Guthrie, 2008), as well as to other economic and social contexts (such as in Yuan *et al.*, 2003; Weaver & Rotmans, 2006 and Nootboom, 2007). The various spheres of application include campuses, local communities, industry, and cities (Corbiere-Nicollier *et al.*, 2003; Fraser *et al.*, 2006; Gibson, 2006a; Liou *et al.*, 2006). This study focuses on conceptual classifications related to the EA process for three main reasons. Firstly, most SA approaches originate from EA (Pope *et al.*, 2004). This provides a convenient entry point for adapting existing processes to tackle the sustainability agenda in Lesotho. Secondly, it was indicated earlier that EA has a relationship of more than three decades with sustainability issues and provides valuable lessons for SA. Thirdly, EA requirements are legislated and institutionalized in most countries, including Lesotho, as mentioned earlier.

Sustainability assessment approaches, which originate from EA, generally adopt a triple bottom line (TBL)⁵, or three pillar, representation of sustainability issues. The majority of these approaches are integrated assessments, which originate from EIA and SEA. Pope *et al.*, 2004 categorizes these TBL-oriented approaches into EIA-driven and objectives-led sustainability assessment. The major aims of these approaches are to minimize unsustainable practices and achieve triple bottom line objectives. While the triple bottom line model is the most familiar representation of sustainability, which gives equal weight to economic, social and environmental dimensions, it has several limitations that will be explored.

These TBL-oriented approaches are criticized as being limited in their contribution to sustainability; hence an approach called 'assessment for sustainability' is proposed. Table 2.2 compares the three types of SA according to their origins, aims, contribution to sustainability, treatment of impacts,

⁵ Triple bottom line refers to an accounting approach that goes beyond the traditional reporting framework of financial aspects and includes environmental and social aspects. It deals with people and planet alongside profit.

relation to the target, and their main limitations. Pope *et al.* (2004) also assert that not all SA processes or approaches promote sustainable development. They further warn that precaution needs to be exercised in sustainability assessment, so that the promotion of integration does not “*undermine 30 years worth of hard-won environmental policy gains*” (Pope *et al.*, 2004:597).

While the three types of approach presented in Table 2.2 vary, they all give insights into components of effective PSAF biodiversity conservation in rural areas. Adopting elements of the EIA-driven SA approach offers a good entry point for putting SA into operation in Lesotho, because EIA is included within the Environment Act, which is currently under revision. Once the Act is revised, EIA will be a legal requirement, as opposed to the current voluntary adherence. Its relevance is particularly valuable in addressing the negative impacts of the sustainability issues of proposed ecotourism projects within the MDTP area. Similarly, ideas from the objectives-led SEA approach are valuable in that they guide initiatives proposed for biodiversity conservation in going beyond the avoidance of impacts to the enhancement of benefits. Also, insights are given on how to incorporate the strategic objectives required by national, regional and international policies and legal frameworks, into a SA framework. To address weaknesses inherent in the two approaches, the concepts of the assessment for sustainability approach helped to strengthen the approach to be used in this study.

Table 2.2: Comparison of main conceptualizations of sustainability assessment

Aspect	EIA driven integrated assessment	Objectives led Integrated Assessment	Assessment of sustainability
Conceptual Roots	"Ex-post, project based EIA".	"Ex-ante, objectives led SEA".	Conceptualized, with no practical roots.
Purpose	Determination of TBL impacts of a proposal after its formulation and uses baseline conditions to establish their effects on sustainability of TBL dimensions.	Establishment of TBL impacts and options prior to design of proposal.	Find out if an undertaking is sustainable.
Sustainability Input	Three pillar or TBL representation of sustainability. Goal is avoid and mitigate adverse impacts within the three the pillars.	Input towards sustainability vision and related aims. Goes beyond negative impact minimization to improving conditions.	Stakeholders decide on the appropriate perspective of sustainability. All undertakings are measured against this perspective.
Impacts handling	Reduction of adverse impacts.	Enhancement of benefits.	<i>"Starts not from a trade-off perspective between impacts, but from the idea that sustainability may be more than the sum of parts."</i>
Main drawback	Potentially leading to compromising environmental considerations.	Objectives might not exemplify sustainability.	Tailor-making the sustainability concept and criteria to the situation at hand.

Source: Pope *et al.*, 2004.

Proponents of the assessment for sustainability approach suggest that it does not replace other approaches but complements them. Its key strengths are that it helps to guarantee that decisions are sustainable and can be applied to both proposed and ongoing activities. It provides a fitting response to current unsustainable practices related to biodiversity in rural areas in Lesotho. Most conservation activities in Lesotho have been found to be unsustainable (Esenjor, 2005); therefore the sustainability of interventions proposed for biodiversity conservation in Lesotho's rural areas, such as the MDTP, needs to

be evaluated. Furthermore, this approach suggests that relevant stakeholders need to be engaged to decide on a suitable concept of sustainability and to determine criteria for sustainability. This view runs through most SA literature especially those dealing with participatory SA processes (Brugmann, 1996; Barker, 2005; Herath, 2005; Frazer *et al.*, 2006; Tabara *et al.*, 2007; Turnpenny, in press).

The history of SA approaches, which originate from traditional EA tools, such as EIA and SEA, and key approaches, provide valuable lessons on how to design effective SA processes. The assessment for sustainability approach suggests that these lessons need to be tailor made for the situation at hand (Buselich, 2002; Pope *et al.*, 2004; Gibson, *et al.*, 2005). To use these lessons for biodiversity conservation in rural areas, a context-specific meaning of sustainability needs to be determined. This requires clarity on what sustainability means, what needs to be sustained, why some aspects need to be sustained, and for whom they should be sustained. Having established key lessons for effective SA processes, it is important to investigate why frameworks are important for SA, different ways they have been used, and decide on their application for biodiversity conservation in rural areas. The next section, therefore, looks into the importance of frameworks and their functions.

3 USING FRAMEWORKS IN SUSTAINABILITY ASSESSMENT

3.1 Significance of sustainability assessment frameworks

The significance of SA is to address the economic, social and environmental aspects of sustainability holistically and provide integrated information for relevant decision-making levels. A SA process contributes and complements several initiatives, including strategic planning, decision-making, and project and program design, by supplying information for monitoring, evaluation and

impact analysis, reporting on international conventions, state of the environment reporting and also creating awareness regarding sustainable development issues (Guijt & Moiseev, 2001a; Buselich, 2002).

The literature suggests that SA has several purposes. The two main ones are i) to provide an integrated and proactive framework that can be applied flexibly to assess environmental, social, and economic impacts or outcomes of development policies, plans, programs, and actions (Buselich, 2002; Pope *et al.*, 2004; UNEP, 2006), and ii) to serve as an audit or performance check to determine progress towards sustainability (Guijt & Moiseev, 2001a; Dalal-Clayton & Bass, 2002; Dalal-Clayton & Sadler, 2004). These two purposes are served by this study by identifying key components of a SA framework, and also assessing progress towards sustainable development in rural communities within the MDTP area in Lesotho. Sustainability assessment can complement (Guijt & Moiseev, 2001a), or even encompass, other assessment processes, such as EIA and its variants, and SEA (ODPM, 2004a; 2004b). In this instance, SA complements various processes at the national, district, and local community levels such as National Vision 2020; the national poverty mapping exercise; the poverty reduction strategy paper; state of the environment reporting; strategic plans for districts; and management plans for pilot areas at local level.

The creation and application of a framework to structure information analysis, integration and presentation in SA is widely supported by most authors (Buselich, 2002; Dalal-Clayton & Sadler, 2004; Gibson *et al.*, 2005; Lee, 2006; Pope *et al.*, 2004) SA in policy making and planning processes requires two key prerequisites. The first is related to ensuring that decision-making information is evaluated, incorporated and portrayed effectively. The second deals with the need to determine a model or framework of sustainability objectives and elements to guide analysis, integration and presentation. The challenge of SA is to create and apply frameworks *“effectively in order to add value to decision making, providing information that facilitates sound choice and gives a greater*

measure of sustainability assurance or confidence that proposals will meet ESE objectives” (Dalal-Clayton & Sadler, 2004:4). Therefore, the approach of a SA for biodiversity conservation needs to add value to decision-making at all relevant levels.

Sustainability assessment approaches differ widely in purpose and application, leading to definitions that vary according to the field of study or the purpose of the assessment. Dalal-Clayton & Sadler (2004) list examples of 19 acronyms and 27 names for SA. The names are for SA approaches focusing on various aspects including campuses, citizens, communities, countries, corporate organizations, environments, cities, land use, participation, and products. This list of applications indicates that a generic definition of SA is inadequate and no single framework can address all SA tasks. Sustainability Assessment tasks in this instance focus on biodiversity conservation in a rural context.

As mentioned earlier, numerous approaches to SA are evident in the literature. The differences in these approaches are based on the type of tasks and the way information is organized to be meaningful to decision makers. The challenge is to effectively share SA information with diverse stakeholders. The significance of frameworks in arranging SA information in a way that is meaningful to relevant stakeholders is emphasized in a statement by the IISD (1997:10): *“Developing and using a clear conceptual framework for guiding the assessment process is very important...An effective framework helps determine priorities in the choice of indicators... Any framework that is chosen reflects some sort of conceptual model against which the real world can be set ...With a conceptual framework in place, indicators emerge more naturally and can be adjusted to the needs of a given locale or set of decision makers”*. Thus, information needs to be organized in a manner that serves the information needs and priorities of key stakeholders in the MDTP area.

Although various authors agree on the importance of frameworks in SA, the components, definitions and classifications of these frameworks differ. There are different opinions regarding the main components of a SA framework. For instance, UNEP (2006:5,7) notes that the components of a SA framework include *“principles, generic steps, toolkit, example applications...such a framework would define an indicative, flexible approach that would facilitate the application of integrated assessment or sustainability assessment, particularly in developing countries...”*. The Office of the Deputy Prime Minister, London (ODPM) (2004a:26) describes a SA framework as a *“way in which sustainability effects can be described, analyzed and compared. It is central to the sustainability assessment process. It consists of objectives which, where practicable, may be expressed in the form of targets, the achievement of which is measured using indicators”*. Dalal-Clayton & Sadler (2004:14) define a SA framework as a model for incorporating *“goals, principles, rules and indicators drawn from international law and policy, objectives of governments, the private sector or civil society. This framework, however defined, is used to test whether a proposed action approximates towards or away from key requirements for realizing sustainability and to identify the main conflicts and trade off at stake”*. In this study, the components of the framework encompass aspects from the three definitions above and incorporate: a vision of sustainability, sustainability issues and objectives, indicators, principles, generic steps, a toolkit and an example of application.

There are numerous classifications of SA frameworks. IISD (1997) refers to five major groups of frameworks in assessing progress towards sustainable development according to the sustainability dimensions on which they focus. These five groups are further categorized into partial system frameworks, which deal with specific sustainability dimensions, and full system frameworks, which tackle both human and ecosystem elements. Partial system frameworks can be categorized into economic, stress-response and multiple capital

frameworks. Full system frameworks consist of diverse frameworks, which adopt the idea of triple bottom line sustainability, and linked human-ecosystem well-being frameworks. Another classification in Buselich (2002), Dalal-Clayton & Bass (2002) and Dalal-Clayton & Sadler (2004), categorizes frameworks into retrospective and prospective on the basis of how they are applied. Retrospective assessments have three main approaches, namely accounts, narrative assessments and indicator-based assessments. They focus on progress achieved by countries, jurisdictions, sectors, programs or organizations, towards or away from sustainability. Prospective assessments focus on the sustainability of proposed activities, alternatives and undertakings. Indicator-based approaches are preferred in both retrospective and prospective frameworks (Dalal-Clayton & Bass, 2002; Dalal-Clayton & Sadler, 2004). Walmsley (2002) classifies indicator-based frameworks into physical, issue-based, economic and societal frameworks. Application of SA in this study adopts a full system model covering both retrospective and prospective aspects. The indicators in this study are also selected on the basis of the main social, economic and environmental issues of biodiversity conservation.

3.2 Functions of sustainability assessment frameworks

According to Dalal-Clayton & Bass (2002), the role of a SA framework is to determine what needs to be assessed. Two types of interrelated frameworks are described: a framework of parts and a framework of aims. A framework of parts refers to components, dimensions, elements and themes, which must be assessed to correctly evaluate a system and notice alterations. A framework of aims refers to goals, objectives, principles, and criteria. These two frameworks are related, as the framework of aims expresses the aim of each part in terms relevant to sustainability issues and gives ratings of performance requirements. A combination of the two frameworks into a framework of parts and aims, results in a checklist of the human and environmental conditions required for

sustainable development in a specific context. The functions of the combined SA framework adopted in this study entail:

- indication of vital constituents of the system under assessment;
- assessment of each part only once to guarantee efficiency;
- incorporation of all critical constituents;
- identification of inevitable information gaps;
- prioritization of parts based on their values;
- indication of the basis for proposed parts and associated values;
- appraisal of key relationships between the parts;
- arrangement of indicators relevant to the systems.

Dalal-Clayton & Bass (2002) further emphasize that the above tasks can be adequately addressed by a framework if the design of the framework is:

- systemic, to aid the evaluation of the main characteristics of the system, as well as interrelationships between subsystems and major features;
- hierarchical, so that the parts are in a series of levels where the scope of the higher levels is broader than the scope of the lower levels;
- logical, so that the lower levels inform the higher levels and the higher levels guide the content of the lower levels;
- communicable and simple, not technical, so that it can be understood by decision makers.

All these features are considered in the framework for biodiversity conservation in rural areas. Frameworks that are not systemic, hierarchical, logical and communicable have the following shortcomings: failure to produce a clear picture of socio-economic conditions and the state of the environment; omission of essential aspects of sustainability; overlapping components and consequent redundancy and double counting; confusion about what is being measured and why; and a focus on procedures as opposed to the realization of useable results (Dalal-Clayton & Bass, 2002; Dalal-Clayton & Sadler, 2004).

The frameworks and associated groups of information and tools are determined by the tasks, values, and preferences of the practitioner, the intended audience and the stakeholders. These need to be factored in when identifying the requirements for an effective framework for biodiversity conservation. To make frameworks more effective, decision-making criteria need to be selected. This is the subject of the next section.

3.3 Application of criteria for decision-making in sustainability assessment frameworks

Since SA is a route for pursuing sustainability, it also helps to determine the interpretation and requirements of sustainability within specific contexts or conditions. This requires that appropriate sustainability criteria be defined for decision-making in assessments. A prerequisite in the selection of criteria is the determination of guiding principles (IISD, 1997; Pope *et al.*, 2004; Gibson *et al.*, 2005). These guiding principles need to be elaborated for local context and the specific issues at hand. The three most relevant sets of principles for SA for biodiversity conservation are: the Bellagio principles for assessment developed in 1996 (IISD, 1997) outlined in Table 2.3; the principles for sustainability analysis of national sustainable development strategies (Dalal-Clayton & Bass, 2002), which are similar to the Bellagio principles; and those proposed by Gibson *et al.* (2005), which are outlined in Table 2.4. The application of these principles helps to avoid the pitfalls of ineffective sustainability assessment frameworks and processes.

Table 2.3: The 1996 Bellagio principles for assessment

KEY FEATURES	PRINCIPLES	REQUIREMENTS
A. POINT OF DEPARTURE	1. GUIDING VISION AND GOALS	<ul style="list-style-type: none"> • Clear vision of sustainable development. • Goals to elaborate vision.
B. CONTENT, SYSTEM, CONTEXT, PRESENT PRIORITIES	2. HOLISTIC VIEWPOINT	<ul style="list-style-type: none"> • Assessment of overall system and related parts. • Address issues of well-being, state, direction and rate of change and interactions between social, ecological, and economic sub-systems. • Include beneficial and adverse impacts of human activity taking into account the costs and benefits for human and ecological systems.
	3. VITAL COMPONENTS	<ul style="list-style-type: none"> • Address intra and inter-generational equity and disparity focusing on issues such as resource use, over-consumption and poverty, human rights, and access to services, and ecosystems that supply goods and services for human livelihoods. • Address economic growth plus activities that enhance human well-being.
	4. SUFFICIENT SCOPE	<ul style="list-style-type: none"> • Temporal scale encompassing both short term and long term issues for present and future generations. • Spatial scale including local as well as national, regional or international impacts to humans and ecosystems. • Prediction and planning of aspirations and future possibilities on the basis of history and existing situation conditions.
	5. PRACTICAL FOCUS ⁶	<ul style="list-style-type: none"> • Precise framework that arranges information categories and also connects vision and goals to indicators and assessment criteria. • Prioritization of main sustainability issues to be assessed. • Prioritization of indicator set for appraising progress. • Establish possibilities of consistency of measurement allowing comparison.

⁶ The highlighting of practical focus and broad participation depict the key areas of the study, namely framework development and participation.

C. PROCESS	6. OPENNESS	<ul style="list-style-type: none"> • Accessibility of information and tools to all stakeholders. • Clarification of the basis for decisions, value judgments, assumptions, and uncertainties.
	7. EFFECTIVE COMMUNICATION	<ul style="list-style-type: none"> • Address the needs of users. Designed to address the needs of the audience and the set of users. • Have simple structure and language, avoid the use of technical language.
	8. BROAD PARTICIPATION	<ul style="list-style-type: none"> • Engage all key stakeholders including those at grassroots, and professional, technical and social groups, in the decision making process.
D. ONGOING CAPACITY	9. ONGOING ASSESSMENT	<ul style="list-style-type: none"> • Capacity for assessment of repeated measurement to determine trends. • Follow adaptive management to address complexities, changes and uncertainties. • Modification of framework components in line with new information and understanding. • Collective learning mechanisms between stakeholders to strengthen decision-making.
	10. INSTITUTIONAL CAPACITY	<ul style="list-style-type: none"> • Institution of accountability mechanisms and provision of appropriate support for decision-making. • Build institutional capacity for collecting, updating and reporting data. • Build capacity of local people to conduct assessment.

Source: IISD, 1997.

The Bellagio principles (Table 2.3) provide relevant guidance for this study, especially principles five and eight, which deal respectively with the practical focus and participation. These principles are integrated with those in Table 2.4 of this study.

Although perspectives, positions and applications of the sustainability concept depend on different priorities, emphases, and particular situations, the sustainability criteria proposed by Gibson *et al.* (2005) suggest that SA frameworks should ensure that i) existing and proposed unsustainable practices are prohibited; ii) both short-term and long-term issues and effects are addressed; iii) biophysical issues are integrated with relevant socio-economic issues; iv) a precautionary approach is adopted where information is

insufficient to make decisions; v) the application of the framework is flexible and continuously adapted; vi) the needs of various stakeholders with regard to biodiversity and ecosystem services are considered. However, the application of principles for selecting decision-making criteria has limitations, which can only be addressed within the specific situation.

Table 2.4: Gibson principles for selecting decision-making criteria in sustainability assessment

Decision - Criteria	Principle	Suggestions
Socio - ecological system integrity	Establish relationships between humans and ecosystems so that these remain intact in the long term to support both human and ecosystem well being.	<p>Improve understanding of the complexities of the effects of human activities on ecosystems and their ecosystem services.</p> <p>Implement efforts to minimize both direct, indirect, cumulative, synergistic pressures on human systems and ecosystems for enduring livelihoods.</p>
Livelihood sufficiency and opportunity	Maintain and create opportunities for improved lives for individuals and communities without destroying chances of decent lives for future generations.	<p>Ascertain requirements for quality of life, especially for the poor.</p> <p>Engage marginalized people when making decisions on how to meet their needs.</p>
Intra-generational equity	Institute mechanisms that promote adequate meeting of needs without increasing the gap between the rich and the poor in terms of health, security, social recognition, political influence and related issues.	<p>Develop enduring and beneficial ways of life, choices, and an ability to choose for everybody.</p> <p>Promote meeting of needs in ways that consider needs of the poor and disadvantaged by using less materials and energy.</p>
Inter-generational equity	Choose alternatives that promote protection and improvement of sustainable choices of future generations.	<p>Use natural resources in ways that reduce detrimental effects on ecological systems so that they continue to provide services for future generations.</p> <p>Enhance and ensure enduring adaptation and changes in both socio-economic and ecological systems, through maintenance of diversity and effective governance measures including participation and accountability.</p>
Resource maintenance and efficiency	Institute ways to increase the resource base for enduring survival of both humans and ecosystems by minimization of resource exploitation, waste generation, material and	<p>Find ways to be efficient so that economic growth can continue with reduced negative impacts on ecosystems.</p> <p>Establish intentions for use of resources so that what is saved does not get used by the</p>

	energy use.	already rich.
Socio-ecological civility and democratic governance	Awareness creation and capacity building towards use of sustainability principles at all decision making levels including individual, community, government, civil society and private sector.	Establish governance structures to deal with complex socio-ecological systems. Increase mobilization of various stakeholders and processes towards sustainability and promote collective decision-making. Promote understanding of socio-ecological systems, stewardship for both human and ecosystems at all levels from individuals to international bodies.
Precaution and adaptation	Consider uncertainties, prevent risk taking in the absence of adequate knowledge to avoid irreversible damage to both socio-economic and ecological systems. Adopt reflective, adaptive and learning systems.	Use incomplete information carefully by: <ul style="list-style-type: none"> - planning for surprises and adaptations and to promote diversity, flexibility and reversibility. - giving preference to environmentally safe technologies. - selecting options on the basis of broad information sources as opposed to certain knowledge areas. - having practical options and alternative plans; and implementing effective monitoring.
Immediate and long-term integration	Attain a number of positive benefits by using all the above sustainability principles together.	All sustainability aspects should move in a positive direction beyond the short and medium term. Avoid trade-offs except in cases where long term benefits will be realized.

Sources: Gibson, 2002; Gibson *et al.*, 2005; Gibson, 2006a; 2006b.

3.3.1 Limitations of the principle-based approach to criteria selection

The application of principles to formulate criteria for decision-making has limitations that need to be borne in mind in their application for biodiversity conservation (Pope *et al.*, 2004; Gibson *et al.*, 2005):

- The principles are generally stated. Further elaboration and specification of their implications is needed for practical applications in the MDTP rural areas.
- The set of principles addresses complexities, which go beyond current understanding, limited time, and resources for research as well as inadequate institutional capacities.
- Reality demands trade-offs and causes the integration and simultaneous reconciliation of principles to be challenging.

- Principles are only part of the solution, which means that the situation needs to be taken into consideration. The decision-making processes need to pay equal attention to ensuring the relevance of the principles to the circumstances in which they will be applied.

The consensus in the literature on sustainability is that principles should be openly debated with clear reasons for their adoption. Generally, the literature on sustainability assessment advocates open and transparent decision-making with regard to principles. The emphasis is on effective participation to ensure informed and consistent decision-making on how and why to apply the principles. Hence this study emphasizes stakeholder participation in exploring application of SA and identifying key components of a SAF.

As mentioned earlier, the call for integrated and holistic approaches for implementing and assessing sustainability has resulted in major changes in the traditional application of EA. The requirement to consider both conflicts and interdependencies between ecosystems and human systems, makes conventional EA tools such as EIA and SEA inadequate. The use of sustainability assessments is increasing as it is recognized as a more effective EA tool in achieving the goals of sustainability. The MDTP in Lesotho presented a timely occasion to explore SA to effectively address sustainability issues of biodiversity within rural areas. The MDTP also provided a suitable route to devise a process to engage stakeholders at different levels of decision-making including project, national, district and local community levels.

4 CONCLUSIONS

This chapter discussed the historical and theoretical origins of SA. It also examined the uses and significance of frameworks in SA. To inform the components of a SA framework it is evident that:

- Sustainability Assessment is a valuable tool within the discipline of EA in contributing to the pursuit of sustainable development. Its effectiveness requires the consideration of several substantive and process components, which are all relevant to biodiversity conservation in rural areas, especially in the MDTP. Consequently, the next chapter reviews selected SA tools and identifies substantive and process components that are relevant for biodiversity conservation in rural areas.
- Sustainability is a complex term whose implementation and assessment are problematic. The meaning of sustainability needs to be applied to the situation at hand.
- Sustainability Assessment needs to be implemented within a framework of principles and parts, which connect issues and stakeholders from the strategic to local levels.

These concluding remarks reveal the significance of using a SA framework for biodiversity conservation in rural areas. This chapter has revealed that an effective SA framework needs to consider the following:

- Application of SA within a rural context: The knowledge of how various SA approaches deal with biodiversity needs to be established. This necessitates examination of relevant SA approaches and the extraction of applicable lessons for application in the MDTP context as analyzed the next chapter.
- The appropriateness of the toolkit to accomplish an effective and participatory SA process: The selection and application of the most relevant tools for undertaking SA in a participatory manner is the focus of Chapter Four.
- The requirements of the system to be addressed by the framework: Understanding of the main considerations for biodiversity conservation in

rural areas guides on key sustainability issues, priorities and objectives that need to be addressed. This is the focus of Chapter Five.

- The importance of stakeholder engagement: Promoting the effective participation of relevant yet diverse stakeholders in the application of SA and identification of PSAF components is required for decision-making on the identification of priority issues and the information needs for various decision-makers regarding biodiversity conservation. Chapter Six deals with stakeholder views on SA application in the MDTP area.

The historical and theoretical trends of sustainability assessment laid the foundation on which the review of relevant SA approaches can be grounded. The next chapter reviews selected examples of SA approaches to identify key components of a SAF as well as strengths and weaknesses of these approaches for biodiversity conservation in rural areas.

CHAPTER THREE

ANALYSIS OF RELEVANT SUSTAINABILITY ASSESSMENT APPROACHES

1 INTRODUCTION

The need to address the challenges of sustainable development has led to the rapid growth of sustainability assessment approaches⁷ in recent years. Developed countries are in the forefront of designing these SA tools, particularly United States of America (USA), Canada, Europe, United Kingdom and Australia. As a result, a proliferation of various SA tools is evidenced in the literature especially over the past ten years (see IISD, 1997; Ravetz, 2000; UNEP, 2003, Herzi, 2004; Shi *et al.*, 2004; Wiek & Binder, 2005; Turnpenny, in press; Lee, 2006; UNEP, 2006). The starting points for these tools differ; some focus on specific disciplines while others adopt a broad and generic view of sustainable development. Several authors highlight the importance of developing new tools for SA by learning from old tools (Buselich, 2002; Dalal-Clayton & Sadler, 2004; Pope *et al.*, 2004; Gibson *et al.*, 2005).

This chapter reviews relevant SA practice, research, initiatives, frameworks and approaches to identify lessons and components of an effective SAF with a view to:

⁷ The term “approaches” is used in this chapter to encompass initiatives, methodologies, models, procedures and tools related to sustainability assessment.

- pointing out to the strengths and weaknesses of examples of relevant SA approaches for biodiversity conservation in rural areas;
- unlocking the main substantive and process components of SA approaches;
- examining how to address biodiversity issues within SA processes;
- identifying the major tasks of SA and their relevance to biodiversity conservation in rural areas;
- establishing how to best organize these substantive and process components in a framework; and
- determining how participation is incorporated within SAFs.

Since no single SA tool is able to address all sustainability concerns in all situations (IISD, 1997; Dalal-Clayton & Sadler, 2004; Gibson *et al.*, 2005; UNEP, 2006), a total of thirty-five SA approaches were reviewed. Their appropriateness and usefulness towards biodiversity conservation in rural areas was established. These approaches were purposively selected, based on their relevance in providing lessons for the application of SA in the MDTP situation, and also on the availability of information at the time of the study. The first section deals with major international initiatives related to SA and is followed by a section analyzing the status and trends of SA experience in Africa, in particular Southern Africa. Subsequent sections deal with the overview of relevant SA approaches. The section preceding concluding remarks focuses on main lessons from the SA approaches which were analyzed.

2 MAIN INTERNATIONAL INITIATIVES RELATED TO SUSTAINABILITY ASSESSMENT

The importance of measuring progress towards sustainable development and establishing whether proposed and existing undertakings are sustainable, is gaining momentum internationally, as mentioned earlier. This is evidenced by several international initiatives on SA that underscore the significance of SAFs in sustainable development. Since this study explores the requirements for an

effective SAF, it is influenced and aligned with several initiatives internationally. Examples of some of the most relevant initiatives for biodiversity conservation in rural areas include:

- The UNEP framework proposed for the capacity building initiative, which will be described later in this chapter. The aim of this UNEP SA framework is to augment planning processes by integrating environmental, social and economic sustainability issues in developing countries and countries in transition. Its aim is to concentrate on assessing interconnections between trade, poverty and environmental dimensions (UNEP, 2003). The framework is relevant to biodiversity conservation in the rural areas of Lesotho as planned by the MDTP, since the MDTP involves poverty reduction in rural communities through ecotourism businesses, which depend on biodiversity conservation.
- The International Institute for Environment and Development (IIED) recently conducted a study on international experience and practice of SA and released a draft report in 2004. This study revealed amongst other things, that there is limited experience in developing countries such as Lesotho, with regard to sustainability assessment (Dalal-Clayton & Sadler, 2004). The study also stresses the importance of using a SAF to guide undertakings such as biodiversity conservation interventions in rural areas.
- UNEP has proposed a global initiative to develop a voluntary, flexible and international framework for integrated assessment or sustainability appraisal in 2006. It is anticipated that this initiative will be undertaken through partnerships between countries and international organizations such as UNEP, the UNDP, the Organization for Economic Corporation and Development (OECD), the European Union (EU), IIED and SAIEA. The framework is meant to aid countries in the application of integrated and holistic approaches to assessment so that decisions and priorities align with the objectives of sustainable development. The aim of this collaborative effort is to provide a flexible and voluntary SA approach to

- design and implement policies, plans, programs and projects aimed at sustainable development. Consequently, it supports each country's requirements in relationship to the WSSD and MDGs. Proposed projects such as the MDTP in Lesotho need to meet the objectives of sustainable development and the international requirements of the WSSD and MDGs. The process outlined for identifying components of the framework gives relevant insights for a SAF for biodiversity conservation and entails clarification of the main concepts, objectives, and key principles, as well as an examination of existing experiences on effectiveness, toolkits, approaches, processes and uses.
- In 2005, Europe launched a project on "Methods and Tools for Integrated Sustainability Assessment (MATISSE)" to improve SA practice (Weaver & Rotmans, 2006). According to the latter authors the MATISSE project consists of four key tasks:
 - Improve and link current SA tools and also design tools that deal with multiple realms, multiple levels and multiple stakeholders in sustainable development. The main users of the tools are policy makers and SA analysts. This involves the assessment of strengths, weaknesses, overlaps, fitness for purpose, context-specificity, transferability and any critical gaps and linkage problems. The improvements are aimed at the following tasks: sustainability progress monitoring; sustainability impact assessment and evaluation; integrated policy assessment and development; back-casting and forecasting of sustainable development; and managing the transition towards sustainable development.
 - Design a shared conceptual framework for developing, undertaking and appraising SA. This covers institutional requirements and the appraisal of conditions and trends in applying SA in different spheres, decision making levels and stakeholders.

- Application and testing of new tools of Integrated Sustainability Assessment using four case studies covering i) agriculture, forestry and land use, ii) resource use, waste and dematerialization, iii) water, and iv) sustainable environmental technology and development.
- Stakeholder engagement, capacity building across sectors, information dissemination and outreach programs.

The tasks of the MATISSE project are similar to this study in dealing with multiple domains, levels and stakeholders; designing a conceptual framework for developing, undertaking and appraising SA; and engaging relevant stakeholders. However case studies for applying and testing new tools do not cover biodiversity in the case of the MATISSE project.

- A sustainability project on integrated multidisciplinary tools to SA was undertaken between 2002 and 2003 in Australia. The project was called *Integrated Sustainability Assessment: Identifying the range of options for Australia*. A position paper by Dovers (s.a.) has been drafted in relation to this project entitled *Policy assessment for sustainability: institutional issues and options*. This paper looks into institutional arrangements and the expansion of SEA to assist governments and communities in attaining sustainability and well-being. Dovers (s.a.) advocates that key national policy processes need to be assessed in a transparent manner, including policies on conservation or sustainability. Another issue raised is the need for reference frameworks that are not only transparent, but go beyond the advisory role and should have legal power, position, tools and funds for it to change current governance practice. This initiative indicates that a SAF for biodiversity conservation in rural areas requires adequate institutional arrangements to go beyond just an advisory role. In the case of biodiversity conservation in Lesotho's rural areas, the need for suitable institutions is recognized. One of the main components for the MDTP is to create and strengthen

conservation institutions that facilitate a conducive environment for the effective application of a SAF.

All the international initiatives presented above deal with different areas involved in the creation of SAFs. However, they all emphasize that a SAF and its various building blocks, such as principles, processes, criteria and approaches, are fundamental in augmenting planning and decision-making processes aimed at sustainability. Conversely, these initiatives adopt a predominantly generic focus towards sustainability issues at strategic levels, such as for policies, program, and plans but not for local issues, such as biodiversity conservation in rural communities.

Having briefly scrutinized examples of SA initiatives internationally, the next section reviews status and trends on the experience and practice of SA in Africa, focusing on Southern Africa.

3 AN OVERVIEW OF THE EXPERIENCE AND PRACTICE OF SUSTAINABILITY ASSESSMENT IN AFRICA

Many developing countries, including African countries, grapple with the problem of how to tackle sustainability conflicts and interdependencies between the economic, social and environmental dimensions of sustainable development (UNEP, 2003). Furthermore, escalating poverty, ecosystem degradation and the unprecedented loss of biodiversity complicates the implementation and assessment of sustainability in developing countries. The literature reveals that there is a limited amount of SA practice and research in developing countries compared to the practice and research in developed countries. However, it is vital that existing initiatives, which are related to SA, should be reviewed. This is to inform the SAF for biodiversity conservation in the rural areas of Lesotho by identifying and building on relevant foundational

lessons from existing initiatives in Africa, in particular Southern Africa. A key initiative which gives a Southern African snapshot of SA occurred in March 2004 when the IIED partnered with the CSIR and the SAIEA to determine appropriate SA tools and frameworks for Southern Africa. The key findings of this initiative, as noted by Dalal-Clayton & Sadler (2004), revealed the following:

- There is limited experience in SA in Southern Africa generally and most of this experience comes from South Africa.
- Key challenges to SA in Africa are related to the scarcity of experienced generalists to undertake SAs, as well as a shortage of expertise in some key disciplines, such as resource economics.
- Challenges to SA in Southern Africa can be addressed through a framework to guide undertakings.
- A SAF for Southern Africa should emerge from experiences based on two main precedents: existing environmental assessment techniques such as EIA and SEA; and practices within integrated planning approaches.
- A framework should consider the key sustainability concerns of Southern Africa, especially poverty, HIV/AIDS and unemployment.
- Sustainability assessment should adopt a cyclical, iterative approach focused on enhancing existing tools.
- Tools should be cost-effective and contribute towards making decisions. They should be appropriate to the temporal, spatial and institutional situation as well as to the level of decision-making policy, program and project.
- The main elements of a SAF should entail i) a vision for sustainable development; ii) sustainability criteria to enable decisions to be made on compromises and trade-offs; iii) standards, which might be lower than the ones in developed countries, since developing countries need to fight poverty and create employment; and iv) agreement on the extent of acceptable change to ecosystems and human systems.

- A framework should have adequate scientific rigor and should not undermine environmental issues.

Development priorities identified, such as poverty alleviation, HIV/AIDS and unemployment, constitute the main sustainability issues for Lesotho, especially in rural areas. It is therefore important to review examples of relevant SA approaches to find lessons on how to integrate these issues alongside biodiversity. Consequently, the next section is devoted to an overview of SA approaches which are relevant and provide lessons for SA application within the MDTP context.

4 OVERVIEW OF RELEVANT SUSTAINABILITY ASSESSMENT APPROACHES

A literature search was conducted on various SA approaches encompassing sector-specific, partial and complete system approaches.⁸ The selection focused on SA approaches which i) addressed biodiversity issues directly or indirectly where direct emphasis on biodiversity was determined by the presence of biodiversity as a sustainability theme or objective and indirect focus on biodiversity was linked to the environmental sustainability dimension; ii) dealt with stakeholder participation; and iii) indicated how different SA approaches can be arranged within a toolkit.

This study recognizes the existence of partial system approaches and their relationship to biodiversity conservation. However, it is devoted to an analysis of complete system approaches, which holistically deal with both ecosystem and human sustainability issues. These complete system approaches were categorized according to relevant sectors as well as the most appropriate decision making level to which they can be applied, the reason being that

⁸ Partial system approaches deal with a single dimension of sustainability such as economic, social or environmental while complete system approaches address both human and ecosystem dimensions (IISD, 1997).

biodiversity conservation decisions are made at different levels of governance including international, continental, regional, national, district, state or provincial and the local community level (MA, 2005). The next section begins with a review of partial system approaches, then moves on to complete system approaches which covers sector specific approaches, multiple level approaches and lastly location specific or single level approaches. This chapter is not a comprehensive description of all SA approaches. It is a selection of examples, which have relevance to the MDTP context, and also exhibit features that can inform the application of SA in the MDTP area. This selection was also driven by the availability of information on particular approaches at the time of the study.

4.1 Partial system approaches

The selected partial system approaches deal with biodiversity and its ecosystem services, which either directly or indirectly focus on the global level. Examples of these globally based initiatives, which emphasize different sustainability aspects, include the United Nations Global Environmental Outlook, OECD Environmental Indicators, Environmental Sustainability Index, World Resources Report and Living Planet Report, and are biased towards environmental issues. The remaining two, namely the Human Development Index and World Development Indicators, are inclined towards aspects involving humans. While these approaches deal with the sustainability of biodiversity directly or indirectly, they do not indicate linkages between the various dimensions of biodiversity, such as the economic and social dimensions. In addition, they operate at the global level, while the framework in this study addresses lower levels of governance such as national, district and community levels. However, these global partial system approaches are relevant to biodiversity conservation in rural areas as Lesotho needs to report on and address the information requirements of these approaches. Therefore, biodiversity themes and indicators within the SAF need to be aligned to match

the reporting requirements of these global sustainability-reporting mechanisms.

The above section outlines the relevance of partial system approaches to biodiversity conservation in rural areas. The next section highlights complete system approaches.

4.2 Complete system approaches

This study adopts a multiple level focus on SA and addresses three levels, i.e. national, district and local community. Hence, the complete system approaches reviewed in this chapter are categorized based on their relevance to specific sectors and levels of decision-making. The categorization of these approaches according to levels of governance falls into four groups as indicated in Table 3.1: i) key international initiatives; ii) multiple level; iii) sector specific; and iii) single level or location specific covering national or regional levels, cities as well as neighbourhood, community or village levels. While the analysis focuses on these levels, implications for and relationships with other levels of governance are indicated where relevant. Some of the approaches are applicable to more than one decision-making level but the classification in this chapter is based on the most appropriate level of application for biodiversity conservation in the rural areas of Lesotho.

Table 3.1: The categories and names of Sustainability assessment approaches which were selected

Category	Name of tool
Key international initiatives	<ul style="list-style-type: none"> • IUCN SA framework (Guijt & Moiseev, 2001a, b and c). • UNEP capacity building initiative on integrated assessment and planning for sustainable development (UNEP, 2003; 2004a; 2004b; 2007b; 2007c) and its two main frameworks: <ol style="list-style-type: none"> a) UNEP framework for integrated assessment of planning processes in support of sustainability. b) UNEP framework for preliminary review of the planning process. • International Institute for Environment and Development (IIED) study on international experience and practice (Dalal-Clayton & Sadler, 2004). • UNEP global initiative to develop a voluntary and flexible international framework for integrated assessment (UNEP, 2006). • Methods and Tools for Integrated Sustainability Assessment (Weaver & Rotmans, 2006; Tabara, Pahl-Wostl, 2007; Tabara, Roca & Madrid, 2007). • Sustainability project on integrated multi-disciplinary tools to sustainable development in Australia (Dovers, s.a.).
Multiple-level	<ul style="list-style-type: none"> • Common Assessment Framework (Lee, 2006) • Gibson framework (Gibson <i>et al.</i>, 2005)
Sector-specific	<ul style="list-style-type: none"> • Revised framework for integrating ecological, social and financial factors into business decision making (Waage <i>et al.</i>, 2005) • Mining Minerals and Sustainable Development Project (MMSD, 2002) • Forest Stewardship Council (FSC, 2004) • Equator Principles (Gibson <i>et al.</i>, 2005) • The Aral Sea Sustainability Assessment - an analytical modeling framework for managing river basins used for irrigation (Dalal-Clayton & Sadler, 2004). • A framework for utilization and learning using sustainability indicator systems and policy processes in Malaysia (Herzi, 2004). • Strategic environmental assessment for sustainability appraisal of Ghana's poverty reduction strategy (Gibson <i>et al.</i>, 2005). • Sustainability assessment conducted by the University of Berne around Simen Mountains National Park in Ethiopia (Dalal-Clayton & Sadler, 2004). • Examples from South Africa:

	<ul style="list-style-type: none"> ○ Integrated Environmental Management (IEM) processes ○ Integrated Development Planning (IDP) processes (DEAT, 2002). ○ National Environmental Management Act (NEMA) principles ○ Cape Action Plan for the Environment (CAPE) strategy (Dalal-Clayton & Sadler, 2004). ○ Development of sustainability indicators for catchment management information systems (Walmsley, 2002).
Location specific or single level	
National or regional	<ul style="list-style-type: none"> ● Solution Spaces for Decision making (SSP) (Wiek & Binder, 2005) framework ● Western Australia system (Government of Western Australia, 2002; Gibson, <i>et al.</i>, 2005) ● United Kingdom (UK) regional approach to sustainability appraisal (ODPM, 2004a; 2004b) ● Systemic and Prospective Sustainability Analysis (Bell & Morse, 2003) ● Integrated Sustainable Cities Assessment Method (ISCAM) (Ravetz, 2000) ● Assessing Sustainability of Societal Initiatives and Proposing Agenda for Change (ASSIPAC) (Devuyst, 1999 described in Dalal-Clayton & Sadler, 2004 & Gibson <i>et al.</i>, 2005) ● The Hong Kong Sustainability Assessment system for integrated consideration of proposals (Gibson <i>et al.</i>, 2005; Hong Kong Sustainable Development Unit, 2002).
Neighbourhood or Community or village	<ul style="list-style-type: none"> ● Global Eco-village Network and its Community Sustainability Assessment (GEN, 2000) framework. ● Local Agenda 21 campaign by the International Council for Local Environmental Initiatives (ICLEI, 2004). ● Strengthening Rural Communities (Community Builders, n.d). ● Australian local sustainability initiative (Environment Australia, 2002a; 2002b). ● A systems approach for the development of a sustainable community using the sensitivity model for Ping Pong community in Taiwan (Chan & Huang, 2004). ● An integrated approach for evaluation of costal zone sustainability in Shanghai Municipality and Chong Ming Island in China (Shi <i>et al.</i>, 2004).

Source: Author's construction.

The approaches indicated in Table 3.1 were analysed in terms of their substantive and process components as summarized in Table 3.2 and outlined in details in Appendix 1.

Table 3.2: The main substantive and process components from the sustainability assessment approaches which were reviewed

Substantive components	Process components
<ul style="list-style-type: none"> • Sustainability principles, decision criteria, trade-off rules, standards, objectives, indicators, vision, purposes, application rules, streams, scope, participation, evaluations, linkages beyond assessment and efficiencies. • Alignment with EIA and SEA covering: the planning context for SA; the process for undertaking the assessment and using the findings; the technical and consultative methods for assessing impacts. • Addressing sustainability issues beyond legislation requirements. • Selection of objectives on the basis of relevant regulatory and policy framework. • Key stages for sustainability assessment process. • Cyclical approach that allows reflection and learning. • Recognition of feedback and linkages between global, national, and local. • Contribution to larger initiatives by linking all dimensions covering local district, national, regional, and global dimension. • Action plan with roles targets, responsibilities, funding sources and work activities. • Reporting and controlling mechanisms. • Role of government for capacity building. • Types of learning and elements of the learning process: who learns, 	<ul style="list-style-type: none"> • Early consultation with relevant community to identify local concerns. • Dynamic, inclusive and ongoing knowledge interaction. • Multi-stakeholder body uses transparent and consultative process with peer review and follow-up audits. • Multi-stakeholder group consisting of representatives from all sectors of the community. • Hierarchical process entailing system definition; identification of outcomes, strategy design, action planning and creation of tool- kit. • Combination of people-centred and technical approaches. • Suggests requirements for sustainability assessment law. Effective processes need to be enforced by law. • Process allowing stakeholder participation during some of the tasks in the sustainability assessment process. • Process dealing with all stages of the learning cycle, reviewing past experience, planning and modeling for the present, looking to develop and change on the basis of what is learned. • Reflection and learning as well as awareness-raising on sustainability issues at the

<p>what they learn and what results from learning.</p> <ul style="list-style-type: none"> • A trans-disciplinary approach on detailed assessment • Combination of technical and participatory aspects in the development of the strategy. • Hierarchical arrangement of various components principles, strategies, actions, criteria and tools. 	<p>community level.</p> <ul style="list-style-type: none"> • Participatory approach that can be administered by communities themselves. • Involvement of community groups and non-governmental organizations (NGOs). • Community participation accompanied by institutional development, capacity building and funding.
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Source: Author's construction.

Depending on the purpose for SA, which is determined by the needs of stakeholders, various substantive and process components are required and need to be combined to suit biodiversity conservation initiatives. However, no single SA tool possesses all required components. This is because every SA tool has strengths and weaknesses for biodiversity conservation in the MDTP context. A summary of these strengths and weaknesses is presented in Table 3.3 while a detailed outline is attached (see Appendix 1).

Table 3.3: A summary of strengths and weaknesses of reviewed sustainability assessment for biodiversity conservation in rural areas

Strengths	Weaknesses
<ul style="list-style-type: none"> • Have provisions for participatory processes for planning by communities themselves. • Relevant to local level use and uses multiple-stakeholder forums for collective decision-making. • Can be administered by local communities themselves. • Can be applied rapidly, saving resources in terms of time and capacity building. • Allows reflection and learning for change towards sustainability. • Presence of funding to support community SA initiatives. • Allows for integration of stakeholder participation within a technical SA 	<ul style="list-style-type: none"> • Are designed for strategic proposals not existing activities. • Are designed for other locations or governance levels such as strategic purposes, national level, cities and not for rural communities. • Are technical for self-administration for poor rural communities; they require experts for their use. • Require more time and capacity building for their application to be effective. . • Focus on other levels of participation such as consultation, not empowerment as required by the MDTP. • Place no emphasis on learning and reflection.

<p>process.</p> <ul style="list-style-type: none"> • Deals with complexities of sustainability and informs vision clarification. • Can be applied at multiple governance levels. • Categorizes SA processes into preliminary and detailed ones. • Level of participation is empowerment. • Provides ideas on how EIA or SEA can be entry points for SA application. • Gives procedures for a SA process that encompasses expert and participatory approaches. • Complementary role to other sustainability initiatives indicates how SA fits into these. • Complements other planning processes to be undertaken - not as a standalone process. • Informs on how to select sustainability objectives on the basis of relevant policy and regulatory framework. • Development of indicators in a participatory manner allowing reflection and learning by all relevant stakeholders. • Cyclical approach dealing with all the stages of the learning cycle. • Hierarchical framework allowing nested decision making. • Organization of various SA tools according to and based on their complementary roles and relationships. 	<ul style="list-style-type: none"> • Require more time and capacity building and more money, this is a disadvantage especially for poor rural communities in developing countries. • Are appropriate for community level but not for other higher levels. • Are designed for specific sector such as business, water, forest and mining and not for biodiversity in rural areas. • Present principles only, does not have other components for pragmatic use within the MDTP context. • Are too generic and needs to be tailor-made for the SA situation at hand so that key components are considered and applied in the context of biodiversity conservation in rural areas.
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Source: Author's construction.

Since no single tool has all the strengths, application of SA approaches requires a combination of relevant tools that can complement one another to meet the needs for a SA process. The next section is a selection of seven SA approaches whose strengths were found to be more relevant than others for biodiversity conservation in rural areas. The strengths were determined by checking the various SA approaches against the main functions to be served by a SAF for biodiversity conservation in rural areas. These functions were listed earlier in Chapter Two and include:

- indication of vital constituents of the system under assessment;
- assessment of each part only once to guarantee efficiency;
- incorporation of all critical constituents;
- identification of inevitable information gaps;
- prioritization of parts based on their values;
- indication of the basis for proposed parts and associated values;
- appraisal of key relationships between the parts;
- arrangement of indicators relevant to the systems.

Other aspects which were used to select the most relevant approaches are those indicated by Dalal-Clayton & Bass (2002), also indicated earlier in Chapter Two, dealt with whether the SA approach was systemic, hierarchical, logical, communicable and simple, not technical.

4.3 Brief description of relevant sustainability assessment approaches

Analysis of the selected SA approaches uncovered seven approaches whose features provided more relevant functions than others for application of SA in the MDTP context (see Table 3.4). These SA approaches are described briefly in this section.

Table 3.4: The seven frameworks that are more relevant for the MDTP context

Approaches	Name of tool
Key international initiatives	1. IUCN SA framework
	2. UNEP capacity building initiative on integrated assessment and planning for sustainable development
	a) UNEP framework for preliminary review of the planning process.
	b) UNEP framework for integrated assessment of planning processes in support of sustainability
Multiple-level	3. Common assessment framework
	4. Gibson framework
Sector-specific	5. Revised framework for integrating ecological, social and financial factors into business decision making
Location specific	National or regional
	6. Solution Spaces for Decision making (SSP) framework
	Neighbourhood or Community or village
	7. Global Eco-village Network and its Community Sustainability Assessment framework

Source: Author's construction.

4.3.1 The International Union for Conservation of Nature Sustainability Assessment approach

The IUCN Sustainability Assessment approach was developed to assess the impact of interventions of national and local strategies for sustainable development on human and ecosystem well being. Its application is described in detail within a comprehensive toolkit (Guijt & Moiseev, 2001a; 2001b; 2001c). It aids stakeholders in addressing a broad range of concerns to simultaneously tackle socio-economic and ecological sustainability. It is based on a concentric two-pillar approach, which depicts the interdependencies of human and ecosystem well being in the form of an "egg of well being". The human system is represented as the egg yolk within the ecosystem, which is in turn depicted as the egg white. This SA approach has been tested with the support of the International Development and Research Centre (IDRC) in

various developing countries including Zimbabwe, India and Nicaragua. It has seven key characteristics, which are categorized under substantive and process characteristics, as indicated in Box 3.1.

Box 3.1: The seven key characteristics of the IUCN sustainability assessment approach
<p>Substantive characteristics</p> <ul style="list-style-type: none"> • Simultaneous and identical consideration of human systems and ecosystems. • An analytical hierarchy based on a broad vision of sustainability that narrows to specific dimensions, to elements, and then to objectives. • Three types of tools exist to visually represent sustainability information for different purposes: Barometer of sustainability, the egg of well-being, and maps. • Indicators to communicate the performance of dimensions towards the set vision. <p>Process characteristics</p> <ul style="list-style-type: none"> • <i>“A seven stage cycle of progressively detailed reflection, analysis and judgment that helps ensure that all important elements are not missed and that measurements show overall sustainability as well as progress for key elements.”</i> • The application of a combination of description, measurement and mapping of details in interpreting results. • A process that meets the information needs of users in understanding sustainable development on its own terms.

Source: Guijt & Moiseev, 2001a; 2001b; 2001c.

This approach has three main complementary roles when compared to other processes such as strategic planning, decision making, project and program design. Firstly, it is a source of information and also organizes information for planning, monitoring, evaluation, impact analysis, reporting on international conventions, state of the environment reporting and specific themes. Secondly, it provides a procedure for engaging stakeholders in collecting, interpreting, reflecting and learning from information. Thirdly, it is a reflective process, which raises awareness about sustainability issues. All these features were used in this study to engage stakeholders, meet various information needs

on the sustainability of biodiversity conservation and allow for reflection on issues amongst stakeholders (Guijt & Moiseev, 2001a; 2001b; 2001c).

The framework has seven cyclical stages: stage 1 - determination of the purpose of the assessment; stage 2 - definition of the system and goals; stage 3 - clarification of the dimensions and selection of the elements and objectives; stage 4 - selection of the indicators and performance criteria; stage 5 - collection of data and mapping of indicators; stage 6 - combination of indicators and mapping of indices; and stage 7 - review of the results and assessment of the implications. This framework allows for four types of assessment: i) complete assessment of all the seven stages; ii) partial or abbreviated assessment, which is either data focused or reflective (excludes stages 5 and 6); iii) second assessment, after the initial assessment, for measuring trends; and iv) research-oriented using some, or all of the seven stages, focusing on specific theme(s). This study combines ideas from reflective and research-oriented assessment, while focusing on biodiversity conservation as a theme (Guijt & Moiseev, 2001a; 2001b; 2001c).

The IUCN approach provides five human and five ecosystem dimensions from which users choose elements, indicators and objectives. The five human dimensions are health and population; knowledge and culture; wealth; community; and equity; while the five ecosystem dimensions are land; water; air; species and populations; and resource use. Biodiversity issues are addressed within four ecosystem dimensions. In the water and land dimensions, biodiversity issues are addressed at the ecosystem level on the basis of services provided for human well-being. Similarly, the resource use dimension also focuses on the sustained supply of ecosystem services from biodiversity for human well-being. Under the species and populations dimension, the focus on biodiversity issues is related to the intrinsic value of biodiversity and not to the supply of ecosystem services for human well-being.

The framework is applicable at most governance levels, from the global to local levels. Its lowest level of application is at the local district or municipal level, but it is not applicable at the village level, which requires another method of assessment. It recognizes that each level has different stakeholders, data requirements, data availability and implications. It is flexible and allows for the modification of the assessment process to fit the situation and the stakeholders. It also recognizes that assessments should not be once-off initiatives but should be cyclical to allow for reflection and learning (Guijt & Moiseev, 2001a; 2001b; 2001c). This SA tool was preferred and recommended by the MDTP for undertaking SA. However, its application with regard to the participation of rural communities was found to be limited, as it is not designed for self-administration by communities at village level. It was, therefore, complemented by the GEN CSA described later in this chapter.

4.3.2 United Nations Environment Programme Initiative on Capacity Building for Integrated Assessment and Planning for Sustainable Development

Recognizing challenges facing developing countries in dealing with the interrelationships between the social, economic and environmental dimensions of sustainability, the Division of Technology, Industry and Economics of the United Nations Environment Programme (UNEP) embarked on an initiative in 2003 to build the capacity for conducting SAs and planning for sustainable development. Prominence was given to the application of logical and user-friendly procedures to help developing countries, and countries in transition, in the use of SA and planning. In this way countries are able to address environmental, social and economic objectives and relate them to poverty alleviation, environmental management and the promotion of sustainable trade. UNEP proposes two types of flexible frameworks, one for the preliminary review of the planning process and the other for undertaking SAs. These frameworks are suitable for Lesotho, which is a developing country grappling

with poverty. They are also suitable in the context of the MDTP that focuses on interventions to sustain the conservation of biodiversity.

a) The UNEP Framework for Integrated Assessment of Planning Processes in Support of Sustainability

The UNEP Framework for Integrated Assessment of Planning Processes In Support Of Sustainability, regards planning, assessment and evaluation of a particular strategic intervention as a cyclical process. The aim of the framework is to augment planning processes by integrating environmental, social and economic sustainability issues. The area of emphasis is the interconnections between trade, poverty and the environment. Consequently, the social dimension needs to address poverty and health; the economic dimension needs to tackle trade issues; and the environmental component should address natural resources, goods, services and biodiversity (UNEP, 2003). The areas of focus in this particular framework match the goals of the MDTP, which are to improve economic growth and trade through the tourism industry, thus alleviating poverty while protecting biodiversity. UNEP (2003) gives the main components of the framework as depicted in Table 3.5, these are:

- i) Planning elements and activities entailing initiation, analysis, strategic planning, design of actions and implementation and monitoring.
- ii) Principles of integrated assessment and planning for sustainable development. Two types of integration are presented to avoid negative trade-offs and enhance positive synergies:
 - a. Substantive integration of environmental, social and economic objectives, analysis and issues within a clear sustainability framework of goals, principles and criteria.
 - b. Procedural integration to attain synergy, avoid delay and conflicts through assessment procedures such as analysis and tools of

environment, economy and society within the larger process of sustainable development planning and decision making.

- iii) Capacity building and principles of good governance including equity in stakeholder participation, legitimate local ownership, access to information and transparency; accountability, respect of rules and regulations.

Table 3.5: Framework for Integrated Assessment of Planning Processes in Support of Sustainability

Elements of a planning process	Environmental, social and economic impacts and issues	Trade-off, synergy against sustainability reference points	Good governance issues and criteria for a sound process
<ul style="list-style-type: none"> • Initiation • Analysis • Design of strategy / strategic planning • Design of actions / operational planning • Implementation and monitoring 	<ul style="list-style-type: none"> • Environmental Impact Assessment • Economic Impact Assessment • Social Impact Assessment 	<ul style="list-style-type: none"> • Sustainability goals • Principles • Standards • Indicators 	<ul style="list-style-type: none"> • Participation • Transparency • Accountability • Ownership

Source; UNEP, 2003:7.

Prior to applying the Framework for Integrated Assessment of Planning Processes in Support of Sustainability UNEP proposes that a preliminary review be conducted. This is the subject of the next section.

b) Framework for a Preliminary Review of the Planning Process

The Framework for a Preliminary Review of the Planning Process advocates self-assessment within countries. It consists of substance and process questions for each planning element. These questions serve as mechanisms to effectively address linkages between environmental, social and economic sustainability

issues. They also help to integrate principles of governance such as transparency and participation. The framework also contains guidelines for use, contents of self-assessment and tools and methods for integrated assessment and planning (see Box 3.2).

Box 3.2: Guidelines, contents of assessment, proposed tools and methods for integrated assessment and planning
<p>Guidelines for applying the framework for a preliminary review of the planning process</p> <ul style="list-style-type: none"> • Use questions to: <ul style="list-style-type: none"> ○ assess condition and trends of sustainability issues for a particular plan or intervention; ○ identify strengths, weaknesses and gaps in the plan or intervention and prioritize improvements on the basis of gaps and weaknesses; ○ selectively address priority issues • Use existing tools and techniques to fill gaps and overcome weaknesses. • Conduct preliminary assessment as a process of self-assessment by engaging stakeholders as well as facilitators and external experts. • Differences of opinion need to be documented. • Reflect on success indicators to show how the project has been able to advance sustainable development in the region and / or sector in question.
<p>Reporting requirements</p> <ul style="list-style-type: none"> • Information on the plan and planning process under assessment including regulatory framework, elements of the plan, main authorities and agencies involved, institutional level (national, regional and local) that have been involved, sector that has been involved, geographical coverage, other plans or planning processes relevant to the plan. • Participants involved in conducting preliminary assessment. • Outcomes of each question or selected questions indicating gaps, weaknesses and priorities. • Tools techniques and tools proposed to deal with selected priority weaknesses and gaps and also stakeholders to be involved. • Plan of activities to improve plan and planning process on identified weaknesses and gaps using selected tools.
<p>Tools and methods</p> <ul style="list-style-type: none"> • Initiation - stakeholder analysis and mapping; stakeholder engagement • Analysis - Identification of key environmental issues; poverty perspectives and root cause analysis; trend mapping and analysis; identification of key sustainability issues;

identification of root causes and opportunities for sustainability problems.

- Strategic planning - defining a vision; defining objectives and goals in line with the vision
- Operational planning
- Implementation and monitoring

Source: UNEP, 2003:11.

The questions for preliminary analysis within the UNEP frameworks, aid stakeholders in identifying biodiversity issues, strengths, weaknesses and priorities. Since the MDTP is a participatory planning project for the conservation and development of biodiversity; stakeholders need to be involved in identifying issues, strengths, weaknesses and in prioritising areas for action. The main strengths of the two SA approaches developed by UNEP for developing countries are the information provided on how to integrate sustainability interdependencies between human systems and ecosystems and the clear methods for addressing trade-offs. However, these methods are not applicable at the village or community level. In addition, they are designed to be used either by experts or by government authorities, and not by local communities or institutions.

4.3.3. The Common Assessment Framework

The Common Assessment Framework (Lee, 2006) is an approach that advocates the application of a combination of technical and people-centred processes to determine a satisfactory SA. The technical processes follow traditional EIA and SEA steps such as screening, scoping, detailed investigations, report review, management plans, monitoring and evaluation. The people-centred processes advocate the use of an effective and appropriate participatory approach that harmonizes and complements the technical and scientific approach. The ultimate aim is to produce quality and effective SA approaches. The strength of the common assessment framework for use in the MDTP context is that it shows how to extend traditional environmental assessment tools, such as EIA and SEA,

towards SA. It also highlights the role of a PSAF in complementing the scientific approach by integrating various stakeholder issues and, more importantly, is based on a common and agreed understanding of what comprises a satisfactory SA process by practitioners, researchers and stakeholders. In the case of biodiversity conservation in rural areas this conceptualization was applied through the collaboration of researchers and stakeholders to identify components of an effective and satisfactory framework. However, this approach is more valuable for use by higher levels of governance, such as district and national levels, than by community or neighborhood levels.

Lee (2006) proposed that this framework should have three interconnected elements which also suit the MDTP context: i) the planning context for SA which is biodiversity conservation; ii) the process for undertaking the assessment and using the findings, which follows a participatory approach; and iii) the technical and consultative methods for assessing impacts which need to be identified for the MDTP setting.

4.3.4 The Gibson Framework

The Gibson Framework (Gibson, 2002; Gibson *et al.*, 2005) is a generic approach with suggestions on sustainability components and processes applicable within diverse settings, including biodiversity conservation. The approach suggests eight decision criteria for SA, sets out six SA trade-off rules, and proposes basic design components for formal SA processes covering the following: purposes, decision criteria, application rules, hierarchies and tiers, streams, scope, participation, evaluations, linkages beyond assessment and efficiencies. The purpose of the Gibson framework is to distinguish main generic components to be considered and tailored for a situation-specific SAF. These components are very comprehensive and are applicable to the MDTP areas but they need to be tailor-made for the situation being assessed.

Guidance for the specified process provides a working basis for designing SAF, which fits the context in terms of sustainability objectives, priorities and criteria so that these are incorporated into decision-making (Buselich, 2002). Other sustainability assessment researchers concur with Gibson *et al.* (2005) regarding the main components of SA (Guijt & Moiseev, 2001; Dalal-Clayton & Sadler, 2004; Lee, 2006; UNEP, 2006). For instance, these authors agree that the purpose to be served by a framework needs to be established in a participatory manner.

This approach also specifies the type of participation required for sustainability assessment and outlines the need for transparency, accountability, and the effective engagement of participants throughout the SA process. It denotes the aim of participation as *“to...mobilize public knowledge as well as specialized technical knowledge; encourage participants to look beyond their specific interests, mandates and expertise; ensuring effective public as well as technical notification and consultation on key points throughout the process; provision of support and resources for participants to engage meaningfully and effectively through the process; open access to sustainability assessment”* (Gibson *et al.*, 2005:156, 242). All these requirements for participation are important for biodiversity conservation in rural areas. Although these specifications are comprehensive, they do not address issues of community empowerment, as required for the long-term sustainability of biodiversity conservation in rural areas. In addition, the type of participation deemed satisfactory and effective for different SA tasks, stakeholders and levels of governance, needs to be determined for the circumstances of the MDTP.

4.3.5 Revised framework for integrating ecological, social and financial factors into business decision making

Waage *et al.* (2005:1145-1163) propose a revised⁹ framework for integrating ecological, social and financial factors into business decision-making. This framework responds to the complications faced by the business sector, which is required to integrate sustainability factors into all product decision-making. With regard to biodiversity conservation in the MDTP rural areas of Lesotho, the implementation of ecotourism businesses is proposed, aimed at the economic development of the community. The implication of this approach is that sustainability factors need to be integrated into decision-making regarding ecotourism products.

Another conundrum for the business sector is the proliferation of sustainability assessment approaches. Businesses are faced with a dilemma regarding issues such as the application of sustainability concepts to their specific retail circumstance; the type of process to adhere to; key principles to guide the process; applicable strategies, actions and tools; interrelations between tools and approaches; appropriate use of tools; and criteria to identify more sustainable products.

In this revised model, complementary roles and relationships between various tools are clarified and organized. The framework arranges building blocks of sustainability in a hierarchical manner from outcomes and success principles to strategies, actions, criteria and lastly a toolkit. This nested decision making model is applicable in arranging the various components of the framework for biodiversity conservation in rural areas to incorporate specific and more detailed assessments within broader ones. The approach systematically arranges the various components of ecosystems and human systems in which businesses are operating. The various components depicted in Table 3.6 are

⁹ The revision is from a model proposed by Robert *et al.* (2002).

organized hierarchically to guide a decision making process which fits proposed ecotourism businesses in the MDTP area.

Table 3.6: Levels, framework components and main considerations for business decision making to deal with sustainability factors

Level	Components	Main considerations
1	System definition	Features of system. Relevant and applicable principles encompassing ecological and social issues.
2	Success outcomes or principles	Context-specific definition of sustainability. Potential ways of detrimentally affecting the system. Principles for sustainability to attain a desirable outcome.
3	Strategies	Strategic principles and guidelines to guide actions towards sustainability.
4A	Actions	Concrete actions to be undertaken to attain sustainability success.
4B	Criteria and characteristics	Characteristics of businesses and their products as informed by sustainability factors.
5	Toolbox	Tools to help monitor and manage actions towards sustainability plans. Tools for capacity building to execute effective actions in line with the strategy. Tools to measure progress towards the sustainability of the system as intended.

Sources: Robert, 2000; Robert *et al.*, 2002; Waage *et al.*, 2005

4.3.6 Solution Spaces for Decision-Making

The Solution Spaces for Decision Making (SSP) is an assessment tool designed to manage city regions and is aimed at economic growth, social cohesion and the enhancement of the environment, as described in Wiek & Binder (2005). Its proponents posit that the Solution Spaces for Decision Making extends traditional environmental assessment tools such as EIA, SEA and Integrated Assessment, to effectively assess sustainable development. The need for the modification and expansion of traditional assessment tools is widely emphasized (IISD, 1997; Dalal-Clayton & Bass, 2002; Dalal-Clayton & Sadler, 2004; Gibson *et al.*, 2005, Tabara *et al.*, 2007). Wiek & Binder (2005:589-608)

contend that this expansion is required to address three main shortfalls of traditional sustainability assessment tools: *“i) using lists of isolated indicators; ii) not performing a consistency analysis of the targets to be achieved, and iii) not utilizing the potential of trans-disciplinary approaches”*. To address these drawbacks, they propose the application of a *“multidimensional sustainability assessment tool”* with three main dimensions:

- The normative dimension deals with the application of the widely held concept of sustainability to city regions and entails the derivation of an appropriate meaning of sustainability by means of identifying problems, and determining sustainability goals and related targets.
- The systemic dimension deals with the specification of targets for the system to be assessed. These targets are related to the use of indicators that represent, describe and monitor the various components of the system including key *structures, processes and functions of the economic, ecological and social spheres*.
- The procedural dimension refers to the use of an effective process to engage interested and affected parties as well as integrating aspects from the normative and systemic dimensions. It is anticipated that through these dimensions decision-making would be rendered more socially acceptable and scientifically sound as a variety of opinions, commitments, expertise and resources would be considered together.

All the dimensions proposed in this approach inform the effective application of SA in rural areas. Moreover, the procedural dimension provides guidance on how to engage various stakeholders within SA processes. Wiek & Binder (2005) argue for two types of approach in the procedural dimension: a participatory approach and an expert approach. They argue that a participatory approach is required to enable affected people, such as citizens and entrepreneurs, to express and thrash out their viewpoints regarding the development of a city region. On the other hand, stakeholders within the expert approach include academics, researchers and jurists trained in appropriate disciplines. These

stakeholders work together to address complex problems, where professional expertise is needed to ensure the professional soundness of decisions. The participatory and expert approaches are compared in terms of user groups, goals, functions, relevant stakeholders, knowledge and methods in Table 3.7.

Table 3.7: Comparison of participatory and expert approaches regarding lead users, goals, functions, level of participation, involved stakeholders, knowledge and methods

Aspect	Participatory approach	Expert Approach
Lead users	Policy makers and planners	
Goal	Sustainability optimization of a city region or sector	
Functions	Monitoring, evaluation, steering	
Level of participation	Informative, consultative	
Involved stakeholders	"Affected" persons e.g. citizens, officials, entrepreneurs.	Experts, e.g. academics, researchers (institutes, NGOs), jurists.
Systemic knowledge	Experiences	Expertise
Normative knowledge	Preferences	Principles
Methods (adapted to the skills of the persons involved)	Facilitating, visualizing, simple structuring, and connecting techniques	Scientific and computer based information systems, analytical tools and evaluation methods

Source: Wiek & Binder, 2005:593.

The MDTP case warrants the adoption of a participatory approach, combined with the expert approach, to achieve its objectives. However, this particular study on the application of SA for biodiversity conservation in rural areas focuses only on the requirements for a participatory approach. This is because expert related issues are covered by other studies. Also, stakeholder participation is seen as vital within biodiversity conservation interventions in the MDTP. This participatory approach will complement the findings from the expert approach, dealing with technical issues such as the characterization of biodiversity composition, function and structure. The significance of using a

participatory approach to complement an expert approach in sustainability assessment frameworks is supported by Turnpenny (in press).

Having stated earlier that no single tool can capture all stages and dimensions of SA, the participatory approach was selected to design a SAF for biodiversity conservation in rural areas based on the context, the stage of the intervention, and the key affected people. The context for the SA is decision making for planning biodiversity conservation interventions in rural areas through the MDTP. Decision making at this stage necessitated the involvement of stakeholders, who consisted predominantly of local communities, community based structures and relevant government officials, especially at the district level.

Wiek & Binder (2005) indicate that consultation and information giving are key ways in which to conduct participation. While consultation and information giving are also useful in planning biodiversity interventions in the MDTP for various activities and stakeholders, empowerment is the type of participation advocated by the MDTP for local communities.

4.3.7 The Global Eco-village Network Community Sustainability Assessment approach

The Global Eco-village Network has a Community Sustainability Assessment (CSA) approach for use within individual communities (GEN, 2000). The GEN CSA assists communities and their organizations to appraise the sustainability of existing conditions and activities as opposed to proposed ones. Hence it is relevant to the MDTP where biodiversity is threatened by existing activities not proposed activities. It is also a rapid assessment tool that uses a checklist of questions arranged under three categories: ecological, social and spiritual.

Within each category there are seven themes¹⁰. Community members become aware of the sustainability issues they need to address as they reflect and learn on each theme. One of the key requirements for the MDTP areas is awareness-raising on sustainability issues - something which is addressed by this approach. In addition, community members can apply the approach themselves. This is because application of the CSA approach does not require expensive funding and time for capacity building when compared to other tools. This tool was used to supplement the IUCN approach proposed by the MDTP in analyzing progress towards sustainability.

4.4 A toolkit for participatory sustainability assessment in the Maloti Drakensberg Transfrontier Project area

From the seven approaches that were found to be most relevant to the MDTP context, two were selected for exploration of SA for biodiversity conservation. Eight features that fitted the needs of the MDTP during the time of the study were used to select the most suitable approaches. These features were focused on the appropriateness of a tool in terms of: governance level, main users, suitability of the contents and themes of the SA tool, capacity building requirements, awareness-raising, level of participation, reflection and learning, time requirements, and flexibility (see Table 3.8). The IUCN and GEN approaches were found to be more appropriate. The IUCN SA approach was the most appropriate for application at the national and district levels, not the community level. It provides generic steps, tools and examples of application, which are relevant for biodiversity conservation in rural areas. However, it does not provide guidelines for principles in making decisions regarding trade-offs and the selection of decision criteria. The GEN approach is only suitable for application at the community level not the national and district levels. Its features complement those of the IUCN SA approach. Consequently the IUCN and GEN approaches were selected for use in tandem because they fit most of the criteria for SA application in the MDTP.

¹⁰ More information on the themes and their application in the MDTP situation is found in the next chapter.

Table 3.8: Sustainability assessment approaches and related key points of relevance and lessons

Name of tool / criteria for appropriateness	Appropriateness for the MDTP context								
	<i>Governance level</i>	<i>Main users</i>	<i>Suitability of SA tool content</i>	<i>Capacity building requirements</i>	<i>Relevance for awareness-raising</i>	<i>Level of participation</i>	<i>Suitability for reflection and learning</i>	<i>Time requirements</i>	<i>Flexibility</i>
IUCN SA approach	Multiple	SA analysts Policy makers Other stakeholders	Suitable	High	Relevant	Consultation and collaboration	Suitable	High or low based on the purpose of SA	High
UNEP capacity building initiative on integrated assessment and planning for sustainable development	National	SA analysts Policy makers	Not Suitable	Moderate	Relevant	Consultation and collaboration	Suitable	Moderate	Moderate
Common Assessment Framework	Multiple	SA analysts Policy makers	Not Suitable	High	Relevant	Consultation and collaboration	Suitable	Moderate to High	High
Gibson framework	Multiple	SA analysts Policy makers	Not Suitable	High	Relevant	Consultation and Collaboration	Suitable	Moderate to high	High

Revised framework for integrating ecological, social and financial factors into business decision making	Sector-specific	SA analysts	Not Suitable	High	Relevant	Consultation	Not Suitable	Moderate	Moderate
Solution Spaces for Decision making (SSP) framework	Location specific - City	SA analysts Policy makers	Not Suitable	High	Relevant	Different types of participation	Suitable	Moderate	Moderate
Global Eco-village Network and its Community Sustainability Assessment approach	Community	Community members	Suitable	Minimal	Relevant	Empowerment	Suitable	Moderate	High

Source: Author's construction.

In addition to briefly describing the seven key approaches that are more relevant than others to the MDTP context, this chapter presents several lessons extracted from all the SA approaches reviewed in the next section.

5 LESSONS FROM SUSTAINABILITY ASSESSMENT APPROACHES

The various examples of SA approaches reviewed in this chapter provide lessons related to the components of a framework suited to biodiversity conservation in rural areas. These lessons are described within subsections 5.1 to 5.5 under the following categories:

- Addressing biodiversity conservation issues within SA;
- Major tasks of SA and their relevance to biodiversity conservation in rural areas;
- How best to organize these components in a framework;
- Type of SA approach, whether it is participatory or technical; and
- Incorporation of participation within SA frameworks.

5.1 Addressing biodiversity conservation issues

Biodiversity issues are addressed either as independent themes or objectives within the SA approaches analyzed in this chapter. In some cases they are addressed presumably within the component of environmental sustainability. Biodiversity objectives are determined in two main ways: on the basis of the overriding policy and legal framework and through issues-raised by stakeholders in a certain context. The specific details of how various approaches deal with biodiversity conservation, is determined by specific biodiversity issues identified by policy and legal framework, and stakeholders. The most effective way to address biodiversity issues in sustainability assessment depends on the purpose of the SA and the context in which it is applied.

Generally, biodiversity issues are addressed either directly or indirectly within the environmental dimension of sustainability. This indicates that biodiversity is recognized as a key priority within SA. What is not clear is how biodiversity is addressed. Whether it is addressed holistically or in a fragmented approach is not revealed. A holistic view of biodiversity in line with the Convention of Biological Diversity entails the protection of species and ecosystems, sustainable use and fair and equitable sharing of the benefits of biodiversity. Brownlie (2005) indicates that the incorporation of biodiversity issues in the past, especially in South Africa, has had several drawbacks in that biodiversity issues are addressed partially and not comprehensively without addressing the cumulative impact and ecosystem services. Recently, it has been recommended that SAFs for Southern Africa need to enhance and build on existing initiatives and tools (Dalal-Clayton & Sadler, 2004). It is important that these drawbacks are avoided in frameworks for biodiversity conservation in rural areas.

5.2 Major tasks of sustainability assessment approaches

Analysis of key tasks from the SA approaches under review indicates that various approaches are appropriate for various tasks. There is no single tool that addresses all the requirements of a SA for biodiversity conservation in rural areas. The implication of this is that a framework, which addresses multiple levels, requires a toolkit consisting of an appropriate set of SA tools to address tasks at each level, depending on the purpose of the assessment. The review revealed the following to be key tasks for SA:

- Appraisal of sustainability impacts of specific projects, locations and activities such as mining and minerals, forestry, water and financing.
- Design of a process underlying sustainable development to guide integration of sustainability factors into decision making.

- Design of a framework underlying sustainable development for effective and quality sustainability assessment approaches.
- Informing the design of process and framework underlying sustainable development for effective sustainability assessment substance and processes.
- Guiding performance reviews of existing and proposed policies, plans, activities and plans.
- Analyzing dynamics of SD, forecasting sustainability trends, assessing sustainability impact of project options and interventions, monitoring long term process of SD.
- Guiding expansion of tools such as EIA, SEA and integrated assessment through a multi-dimensional tool to manage sustainability.
- Assessment of progress towards sustainability within individual communities.
- Policy learning for change and sustainability.
- Identification of information on ecosystems and human well-being leading to identification of areas for sustainable development.

Having identified that SA application requires a toolkit not a single tool, the concern is how the various tools should be arranged within a SAF. This is the subject of the next section.

5.3 Arrangement of tools and their main components within a sustainability assessment framework

The application of a hierarchical framework, that connects SA tools and concerns across multiple levels and dimensions, is the preferred approach (Buselich, 2002; Gibson *et al.*, 2005; Waage *et al.*, 2005; UNEP, 2006; Tabara *et al.*, 2007). An analysis of SA approaches indicates that a single approach is inadequate in addressing diverse and complex SA tasks, contexts and stakeholders. This notion is summarized by Tabara *et al.*, (2007), denoting that

a SA needs to be applied within a complexity of various stages of development, diverse circumstances and different stakeholders. This requires a toolkit of SAF and participatory methods, as no single approach can tackle sustainability in all its multiple dimensions. For the purposes of this study, the SA toolkit consisted of the IUCN approach and the GEN CSA approach.

The building blocks or components of various SA approaches include principles, criteria, standards, objectives, indicators, targets, generic process steps, stakeholders, toolkit, reporting mechanisms, and capacity building. Various SA approaches emphasize different components, based on the purpose of the SA and its level of application. For instance, at the community level, where the emphasis is on reflection and learning, the main components of a SAF include process steps, capacity building, and a toolkit, while at the strategic levels, which include national and regional levels, principles, criteria and standards are the most dominant components. The SA components common to all levels are related to sustainability objectives, indicators, targets and toolkit. The most comprehensive approach, which covers all the key SA components, is the Gibson framework. Various SA components can be applied differently depending on the level at which they are applied as well as on the approach used, and whether it is participatory or expert-based or a combination of both. The incorporation of participation into SA approaches is a key element of this study and is presented next.

5.4 Type of sustainability assessment approach

The majority of approaches use a combination of technical and participatory features. The types of disciplines involved and the participatory process depend on the task or purpose of the SA. Generally, the majority of SA approaches are administered by experts with community inputs at various stages. Few were designed to be applied by local communities to assess the sustainability of an initiative or to audit performance towards sustainability in

their communities. Even the few that can be self-administered by local communities; require external expertise and more time for capacity building. Only one tool, the GEN CSA, is a rapid tool which does not require more resources in terms of capacity building and external expertise. Therefore, the GEN CSA approach was found to be more appropriate than the others for application at the community level. Notably, some approaches combine a participatory approach with a technical approach to sustainability. IISD (1997) advocates that assessment approaches need to create a culture of assessment so that institutions and communities can decide and act effectively through reflection and learning. The principles for sustainability assessment (IISD, 1997; Dalal-Clayton & Bass, 2002; and Gibson *et al.*, 2005) also advocate that stakeholders need to adopt continuous learning, reflection and adaptation to pursue the sustainability of biodiversity conservation.

5.5 Incorporation of participation within sustainability assessment approaches

Stakeholder participation in the initiatives analyzed ranges from non-participation, to serious commitment, to participation through the provision of capacity building and funding. Depending on the level of application and the type of approach used, stakeholder representation includes relevant disciplines, government authorities, non-governmental organizations and local communities. Whether stakeholders view the type and level of participation as adequate or effective is not indicated.

Furthermore, depending on the decision-making level at which a SA approach is applied and the type of approach, participation and stakeholders differ. Participation at higher levels, such as national and regional levels, involves consultation, information sharing and collaboration. At the community and local village level, empowerment and capacity building are predominant. The key question remaining is whether these types of participation are effective in

achieving sustainable decision making for biodiversity conservation in rural areas. Other approaches advocate reflection and learning, as well as social learning and sustainability learning, as part of their participatory processes. The relevance of these various participatory approaches for biodiversity conservation in rural areas needs to be established. Furthermore, most of the approaches are linear and allow only for once-off reflection and learning during the SA process. Few, in particular the seven which were selected as being most relevant, were cyclical and allowed reflection and learning. The cyclical approach is vital for adaptive management and the revision of SA approaches.

After outlining some of the main lessons for application of SA from various SA approaches, it is important to highlight the generic impediments and opportunities of sustainability assessment, which need to be considered for the application of SA to be effective for biodiversity conservation in rural areas.

5.6 Impediments and opportunities of sustainability assessment approaches

The preceding analysis reveals that sustainability assessment approaches have significant drawbacks such as ineffective participation, especially at the local community level; poor integration between the economic, ecological and social sustainability dimensions; lack of clarity in dealing with uncertainties and applying the precautionary principle; and the failure to link sustainability requirements across multiple levels. These impediments are also stressed by several authors (Pope *et al.*, 2004; UNEP 2006) and are further elaborated in Table 3.9. At the same time, these impediments provide opportunities to develop a more effective SAF for biodiversity conservation in rural areas.

Table 3.9: Impediments and related opportunities for sustainability assessment framework for biodiversity conservation in rural areas

Impediments related to sustainability assessment	Related opportunities for sustainability assessment framework for biodiversity conservation in rural areas
<ul style="list-style-type: none"> • Proliferation of sustainability assessment approaches might undermine more than three decades of work and place the environmental dimension at par with the economic dimension in development decision making. Compromises might be made to favor the economy and be detrimental to the environment. 	<ul style="list-style-type: none"> • Sustainability assessment approaches need to be integrated within a hierarchical framework consisting of a toolkit that supports the effective use of environmental assessment tools and procedures, in particular, EIA and SEA.
<ul style="list-style-type: none"> • Overloading and slowing of decision making processes due to the proliferation of complicated sustainability assessment approaches. 	<ul style="list-style-type: none"> • Sustainability assessments should not require separate processes but need to be flexible and be conducted as part of other planning and decision making processes. The diverse approaches need to be arranged according to their appropriate application for various stakeholders, domains and conditions.
<ul style="list-style-type: none"> • Although the policies and legal requirements of most countries and development agencies mandate the use of EIA, few jurisdictions have authorized SEA as a policy or legal requirement. Therefore, at the strategic level sustainability decision making and planning is not common, it is in its formative stages in most cases. 	<ul style="list-style-type: none"> • Introduction of sustainability assessment frameworks and their approaches is a well-timed opportunity to pioneer and harmonize the integration of sustainability issues at strategic levels.
<ul style="list-style-type: none"> • There is no quality control of sustainability assessment approaches. There is also a lack of scientific rigor in some of the approaches. Moreover, there is a lack of consensus and guidance regarding standards for the utilization of tools towards effective sustainability decision making. 	<ul style="list-style-type: none"> • Stakeholder involvement in a dynamic learning and cyclical approach is required to derive and revise standards for each situation. Investigations into an appropriate collection of sustainability assessment approaches to aid sustainability assessment decisions related to specific circumstances such as biodiversity conservation are needed. Also standards need

	to be set to allow comparison of sustainability.
<ul style="list-style-type: none"> • Non-existent human and financial capacity and appropriate institutions to conduct sustainability assessment especially in developing countries. 	<ul style="list-style-type: none"> • Design and introduction of sustainability assessment approaches that can be “self-administered” by stakeholders at various levels. Also, the application of sustainability assessment approaches will need to involve reflection and learning amongst stakeholders so that they can self-administer the approaches and not depend solely on outside consultancy services.
<ul style="list-style-type: none"> • Uncertainties regarding the impact of various sustainability assessment processes on decision making. 	<ul style="list-style-type: none"> • Monitoring and evaluation of sustainability assessment approaches and their impact on sustainability. This requires understanding how sustainability assessment findings affect individual, community, district and national decision making.

Sources: Turnpenney, in press; Buselich, 2002; Environment Australia, 2002; Pope *et al.*, 2004; UNEP, 2004a; 2004b; Gibson *et al.*, 2005; Lee, 2006; UNEP, 2006; De Ridder *et al.*, 2007.

6 CONCLUDING REMARKS

Current research and trends in sustainability indicate that SA is vital in achieving sustainable development. Of paramount importance is the development of frameworks to guide assessments. Generally, experience in sustainability assessment is limited in developing countries. This limited experience is a key challenge that necessitates a framework to guide these undertakings. An appropriate framework needs to build on current experiences and lessons from tools such as EIA and SEA, as well as practices from integrated planning approaches, and should enhance and complement existing tools and practices. Scientific accuracy should underpin framework development and not undermine environmental issues. Also, an effective SA framework should have components such as a vision for sustainable development and sustainability

criteria to be able to make decisions on compromises and trade-offs. Sustainability assessment standards do not have to be at the same level as those of developed countries. They may be lower than those of developed countries as developing countries need to create mechanisms for poverty alleviation and employment creation.

There is no consistent way in which to address biodiversity issues in sustainability assessment initiatives. Some initiatives deal with biodiversity directly while others deal with it indirectly. Sustainability assessment for biodiversity conservation should be holistic and address interdependencies and conflicts between the social, economic and environmental dimensions at relevant temporal, spatial and institutional contexts, as well as at the level of decision-making, such as policy, plan, program or project. Also, the incorporation of stakeholder participation in sustainability assessment approaches should be aligned with the task at hand, the type of situation, information requirements and relevant stakeholders.

While the examples of approaches examined in this study are different, they provide several lessons to guide SAFs for biodiversity conservation in rural areas:

- Since sustainable development has multiple dimensions, an overall generic tool is not practical. There is a need for a framework consisting of principles, criteria, generic steps, objectives, indicators, a toolkit and other context specific components.
- A framework should enhance and build on existing initiatives at all levels including the strategic, project and community levels.
- The efficient application of SA is complicated by the propagation of diverse tools and methods that have been developed. These need to be arranged logically within a framework, and preferably hierarchically.
- Existing approaches can be modified and applied to deal appropriately with the complexities of sustainability even when exploring creative ways in

which to use sustainability assessment for biodiversity conservation in rural areas. Hence two SA approaches, the IUCN one and the GEN one, were modified and used in tandem to explore SA application for biodiversity conservation in a participatory manner. The details of how these were applied are described in the next chapter.

- Biodiversity should be addressed holistically not selectively, in line with international, regional and national policy frameworks, especially with the Convention on Biological Diversity.
- Biodiversity considerations need to be delineated for the situation at hand, without losing scientific rigor.
- An effective SA approach should include both technical aspects and participatory process aspects. The role of a participatory approach should be to complement the technical process.
- Effective SA objectives need to be informed by stakeholder participation and relevant policy and regulatory frameworks.
- Requirements for effective participation need to be established for each level of decision-making, SA task and type of stakeholder.
- Participation should be effective and allow for the reflection and learning of stakeholders to contribute to the sustainability of biodiversity conservation interventions. Hence frameworks should allow for learning and reflection and be cyclical, even at the community level. This chapter also reveals that approaches that allow for reflection and learning, have not been developed for biodiversity conservation at the community level.

The foregoing discussion reveals the lessons and components to be considered when conducting a SA process. It also revealed that sustainability issues related to biodiversity conservation need to be incorporated within a SAF in a participatory manner. Furthermore, it revealed that SA approaches have complementary features and can therefore be used in tandem to offset their individual weaknesses. The next chapter describes the methodology adopted for exploring application of relevant SA approaches in the MDTP situation.

CHAPTER FOUR

BACKGROUND AND METHODOLOGY

1 INTRODUCTION

There is increasing support for the development of sustainability assessment frameworks that are specific to the context, are flexible and agreed on by stakeholders, as opposed to one-size-fits-all frameworks (Gibson, 2001; Buselich, 2002; Gibson *et al.*, 2005; Lee, 2006). The challenge is to identify appropriate parameters for inclusion into these frameworks through the meaningful engagement of stakeholders (Ravezt, 2000; Bell & Morse, 2003; Caffyn & Jobbins, 2003; Wiek & Binder, 2005). This challenge was explored in the MDTP area in Lesotho as indicated in Chapter One. The MDTP is a trans-boundary biodiversity conservation project, located in a predominantly rural mountain area shared by Lesotho and the RSA. Considering that sustainable development is inherently a participatory concept (Bass *et al.*, 1995; Dalal-Clayton & Bass, 2002; Bell & Morse, 2003; 2005; SAIEA, 2004, 2005a and 2005b), the SA process sought to engage stakeholders within multiple decision-making levels encompassing national, district and community levels. Procedures and requirements for identifying issues and engaging stakeholders for other environmental assessment tools, such as EIA and SEA have been developed in Southern Africa (SAIEA, 2004, 2005a and 2005b). On the other hand, little has been done to identify factors for effective and participatory SAFs, especially for biodiversity conservation in rural areas in a developing country such as Lesotho. This is because SA is a newly evolving field (Pope *et al.*, 2004) as indicated earlier.

This chapter sets the context for the SA case study undertaken in the MDTP by first describing the background of the study. It then elaborates on the methodological aspects such as the overall design, population and sampling applied in the study. It also outlines data sources and steps followed in answering study questions.

2 BACKGROUND TO THE STUDY

2.1 Transfrontier Conservation Areas in the Southern African Development Community

International, regional and national instruments and initiatives emphasize the significance of establishing trans-frontier conservation areas (TFCAs) such as the MDTP. The TFCA concept is recognized as an important tool in addressing both human and ecosystem well-being. It involves the integration of ecological and socio-economic issues. TFCAs therefore, assist in promoting the conservation of biodiversity and endangered ecosystems that transcend national borders. Simultaneously, TFCAs are argued to have the potential to enhance the welfare and standards of living of rural communities particularly through the tourism industry.

Figure 4.1 denotes that approximately twenty existing and potential TFCAs have been identified within the SADC region. These TFCAs are at different stages of establishment with some having formulated treaties and memoranda of understanding. The increase in the number of TFCAs is undoubtedly a sign of the acknowledgement of the role they play in sustainable development, particularly for rural areas. The TFCA principle also entails an outreach program for engaging rural areas in meeting the MDGs in the SADC region. The MDTP is one of these TFCAs (denoted with 6 in Figure 4.1).

Figure 4.1: Map depicting eighteen trans-frontier conservation areas identified in the SADC¹¹ region



Source: SADC, s.a.

2.1.1 Socio-economic considerations in trans-boundary protected areas

One of the themes within the TFCAs is the importance of integrating social aspects into trans-boundary conservation. Participatory approaches to nature conservation need also to be adapted to the trans-boundary context. This requires that the socio-cultural conditions of people inhabiting and using trans-boundary areas need to be considered. This implies a paradigm

¹¹ The SADC countries are Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

shift from the conventional approach to protected areas, which prevented human interference, to the model of “*parks with people*”, which is regarded as being more pragmatic (Van de Linde *et al.*, 2001).

Stakeholders and their interests are considered to be an important element in trans-boundary natural resource management. Various stakeholders play the different roles of leaders, facilitators, drivers, champions and implementers within trans-boundary natural resource management (Van de Linde *et al.*, 2001). Hence the approach adopted in this study is participatory and the requirements for the effective participation in SA processes are also investigated. Having indicated the importance of TFCA areas, such as the MDTP area, and the relevance of identifying socio-economic issues by engaging diverse stakeholders, the next section goes on to describe the MDTP.

2.2 Overview of the Maloti Drakensberg Transfrontier Project

The MDTP is a trans-boundary and bilateral undertaking located on the Maloti-Drakensberg mountains as indicated earlier. The MDTP is being implemented within a distinctive biodiversity ‘hot spot’ found in two countries, Lesotho and RSA. This area has been selected as an Afromontane Regional Centre of Endemism, with a large part having been selected as a World Heritage Site. It is implemented within the area found along the 300 km eastern boundary of Lesotho with South Africa. This area has several unique characteristics. In addition to being a World Heritage Site it also a proposed peace park (MDTP, 2007a). Other special features include that it:

- is designated as a special floristic region called the Drakensberg Alpine Region;
- is one of the 200 Global Ecoregions of the World Wildlife Fund;
- belongs among the eight biodiversity hotspots in South Africa;
- is designated as an endemic bird area;
- is a center of invertebrate endemism and its plant endemism is estimated at 51.5% (NES; 1999; NES, 2000a, 2000b; MDTP, 2007a; 2007b).

However, this biodiversity asset is threatened by several factors, including excessive livestock grazing, improper fire management systems, disturbance by human settlements, destructive farming practices such as crop cultivation on steep slopes causing extensive soil erosion, invasion by alien plant species and extreme poverty (MDTP, 2007a; 2007b). The main issues in Lesotho are (i) grazing pressure on rangelands containing globally significant biodiversity, (ii) lack of a protected areas system, (iii) lack of conservation management capacity, and (iv) poor utilization of the potential for nature-based tourism. While the underlying root causes and solutions to threats are understood very well, a strategy to address these threats effectively over the long term is a challenge (NES; 1999; NES, 2000a, 2000b; MDTP, 2007a; 2007b).

Table 4.1 summarizes the main land use types in the MDTP area. This table clearly highlights the significance of managing rangelands in a sustainable manner within the MDTP area. Rangelands constitute the highest percentage of land use within the MDTP area and is estimated at roughly 80%. Cultivation, which is estimated at 18%, is the next highest type of land use. Both rangelands and cultivation are agricultural activities, implying that the sustainability of biodiversity outside protected areas or nature reserves requires that attention should be given to the sustainable management of agricultural activities, i.e. mainly range use and crop production.

Table 4.1: Summary of land use types in the Lesotho MDTP area

Land use type	Hectares	% of Highlands area (TFCA)
Settlements (urban and village)	11 297.44	0.5
Cultivation	432 366.90	18
Rangeland	1 933 566.88	79
Wetlands	38 774.74	1.6
Transformed (dams, mining, roads, plantations)	14 523.84	0.6
Total area	2 430 529.8	

Source: MDTP 2007a:9.

Long-term effectiveness in addressing biodiversity issues is the key requirement for the MDTP area, as mandated by international, continental and regional instruments. In 2002, the CBD and the WSSD adopted the 2010 target to significantly reduce the rate of biodiversity loss. Meeting this 2010 target is now the goal of countries such as Lesotho, which are signatory to the CBD. Conversely, the findings of the MA (2005) revealed that the 2010 biodiversity target will only be achieved through unparalleled efforts to tackle currently increasing biodiversity loss due to the continuing over-exploitation of resources; changes in habitat and climatic conditions; various types of pollution; and invasive species. All these challenges need to be addressed within rural areas covered by the MDTP.

In line with the aspirations of the 2010 target, the World Bank and the governments of Lesotho and RSA signed a grant agreement at the WSSD in 2002, for a long-term partnership between Lesotho and RSA, to protect the exceptional biodiversity of the Drakensberg and Maloti mountains by implementing the MDTP. As indicated in Chapter One, the MDTP is funded by a multi-donor initiative under the GEF. Consequently, Lesotho has planned to increase the coverage of protected areas in the MDTP area. Existing and planned protected areas are portrayed in Table 4.2. Three main types of

IUCN protected areas are envisaged for the MDTP area with the following management objectives:

- Economic and biodiversity functioning of the region, ecosystem protection and recreation for IUCN category II.
- Conservation of specific natural and cultural features for IUCN category III.
- Conservation for sustainable use of natural ecosystems for IUCN category IV.

Table 4.2: Existing and planned protected areas in the MDTP area

IUCN category	Name	Area in hectares	Status	Main management objective
II	Senqu sources	3340	Proposed	Conservation for economic and biodiversity functioning of the region, ecosystem protection and recreation.
	Liqobong	2200	Proposed	
	Sehlabathebe National park	6475	Operational	
	Tsehlanyane Nature Reserve	5333	Operational	
	Bokong Nature Reserve	1972	Operational	
III	Liphofung Cave Rock Art Site	4	Operational	Conservation of specific natural and cultural features.
	Butha Buthe Mountain		Planned	
VI	Sehlabathebe Managed Resource Area (MRA)	33 000	Operational	Conservation for sustainable use of natural ecosystems.
	Mokhotlong/Sanqabethu MRA	52 000	Operational	
	Moteng MRA	Unknown	Proposed	
	Liseleng ERMA	8385	Dormant	
	Mofolaneng ERMA	145 988	Dormant	
	Khubelu ERMA	140 488	Planned	
	Ramatseliso ERMA	10 082	Dormant	
	Corridor between Bokong and Tsehlanyane	6836	Proposed	

Sources: NES, 2000a; 2000b; MDTP 2007a:38.

- The strategy to ensure the long-term sustainability of biodiversity entails the integration of four aspects - conservation, sustainable use, land use and development planning. The main objective of the MDTP is to conserve globally significant biodiversity in these rural mountain

areas using a regional and ecosystem approach. The secondary objective focuses on community development through income generation from nature based tourism. This objective mandates capacity building and stakeholder participation and also aims to create a regional tourist area for both Lesotho and RSA.

It is essential to provide the historical context for the MDTP in the next section.

2.3 Historical background on biodiversity conservation initiatives for the Maloti Drakensberg Transfrontier Project Area

Implementation of the MTDP is in two main phases, the first phase began in 2003 and ended in 2007. The second phase followed at the beginning of 2008. Through Phase 1, a twenty-year strategy for managing the MDTP as a living landscape was developed (MDTP, 2007b). The two phases of the MDTP build on the foundation of several initiatives that span close to three decades, as illustrated in Box 4.1.

Box 4.1: Main milestones on biodiversity conservation on the Maloti Drakensberg Transfrontier and Conservation area (MDTCA)	
<i>Year:</i>	<i>Milestones description</i>
1975:	Report on Development Plan for Tourism for the Kingdom of Lesotho noted lack of protected areas in the MDTCA and proposed the creation of a Drakensberg Ridge National Park.
1977:	IUCN report identifying the MDTCA significance for conservation and development and proposed protective measures covering Sehlabathebe National Park to create Lesotho National park.
1982:	Formation of an Intergovernmental Liaison committee between Lesotho and RSA aimed at coordination of various cross border issues emphasizing the protection of ecological integrity of the Maloti Drakensberg Mountains for their water provision. Consequently, RSA funded the Drakensberg/Maloti Mountains Catchment Conservation Programme (D/MMCCP).
1983 till 1988:	Land Conservation and Research Development Programme (LCRD) funded by USAID overlapped with the D/MMCCP. It

	focused in training and implementing range management and monitoring measures across Lesotho. Project produced detailed vegetation maps for the MDTP area in Lesotho.
1986 till 1989:	D/MMCCP was a research program to formulate a framework for integrated land use planning. It supported the concept of creating a Managed Resource Area (MRA) category of protected areas in the afro-alpine area in Lesotho.
1993 till 1995:	Community Based Natural Resources Management (CBNRM) project embarked on further community mobilization and facilitation of community participation in natural resource management. In 1993 the Range Management Division prepared legislation related to the establishment of Managed Resource Areas but did not complete the process due to problems in implementing grazing controls. This is being pursued again by the MDTP by drafting by-laws for MRAs.
1994:	Establishment of NES that raised environmental issues higher on the agenda, including biodiversity conservation in the MDTP areas. This led to the EU funded Drakensberg/Maloti Mountains Conservation Programme in the MDTP area.
1997:	Lesotho and RSA signed a declaration recognizing biodiversity, and the cultural and ecological importance of the Maloti Drakensberg Mountains. Preparatory reports were compiled leading to securing of funds to begin the MDTP. In Lesotho this phase occurred in 1999.
1998 till 1999:	D/MMCCP commissioned under NES and funded by the European Union. The focus was to aid NES to pilot an integrated natural resource management plan using the Sanqabethu Valley in Mokhotlong district. The project collected baseline data, analyzed current land use situation and identified and discussed opportunities with stakeholders. The project concluded that participatory approaches are most appropriate for natural resource management to address conservation issues. However, there is a need for prior addressing of institutional constraints.
2001:	Updating of declaration to a bilateral Memorandum of Understanding (MoU) through which Lesotho and RSA committed to joint cooperation in managing environmental problems. From the MoU, there was a proposal to create the Maloti Transfrontier Conservation and Development Area. This culminated in the initiation of Phase 1 of the MDTP that commenced in 2003 and continued until 2007.

Sources: NES 2000a, 2000b; MDTP 2006, 2007a; 2007b.

Phase 1 of the MDTP has eight components to be outlined later in this Chapter. These eight components of the MDTP need to be implemented and assessed simultaneously, using an integrated and holistic approach, hence the need for a sustainability assessment framework. The key sustainability aspects include social, economic, institutional, and environmental aspects.

2.4 Participation in biodiversity conservation in the Maloti Drakensberg Transfrontier Project Area

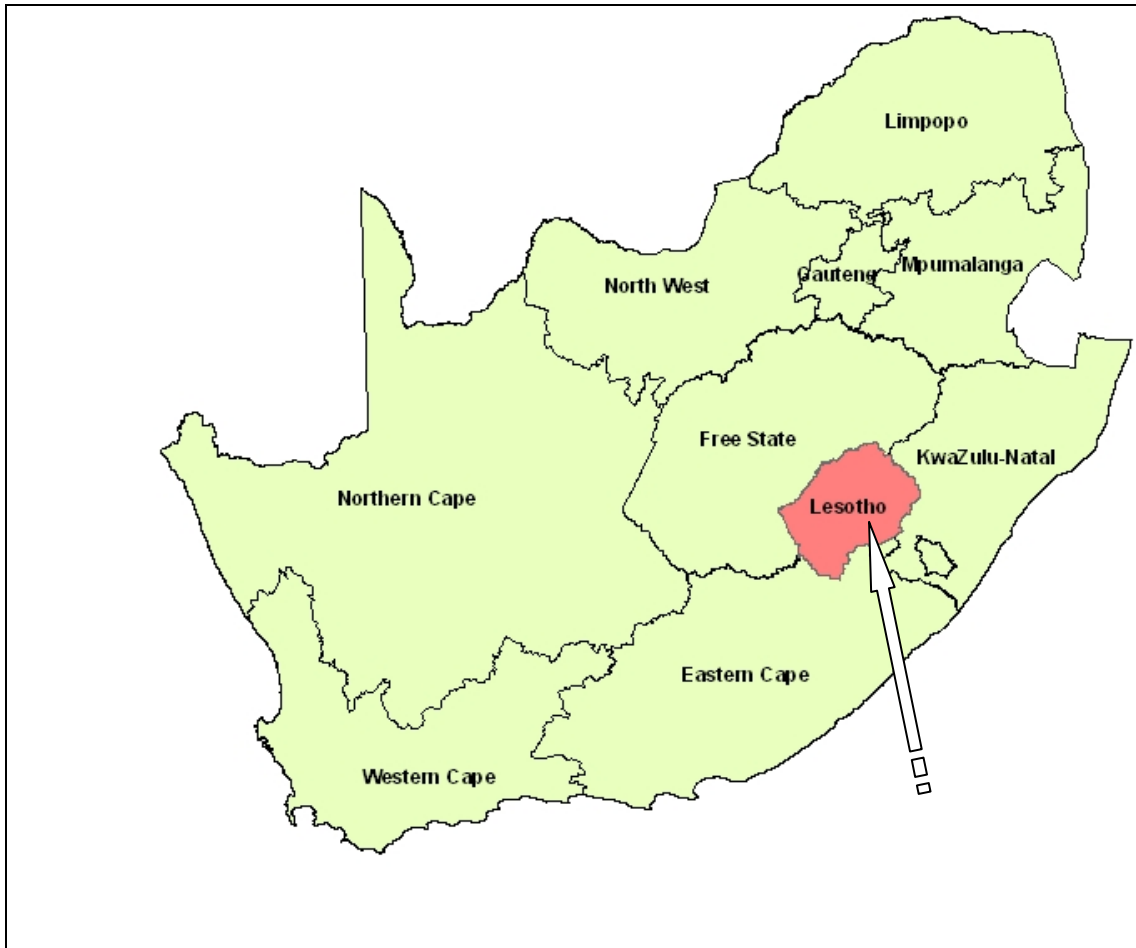
The overriding component for the success of the MDTP is the effective participation of stakeholders, especially communities, at all stages of the project and beyond. Participation is regarded as a priority throughout all MDTP components and initiatives, including investigations regarding the components of an effective sustainability assessment framework. Effective participation is regarded as indispensable for guaranteeing the sustainability of biodiversity conservation during the project life and beyond. This study also addresses the challenge of determining factors for effective participation that encourage the long-term sustainability of biodiversity on the Lesotho side of the MDTP. Conversely, effective participation in environmental decision-making is a challenge in the SADC region, including Lesotho. This situation was revealed by a recent situational assessment conducted by the SAIEA. From this analysis, it was found that there is a wide gap between participatory policy and practice. While study participants agreed on the importance and role of participation, their practice of participation was ineffective (SAIEA, 2003a). This study deals with the requirements for an effective and participatory SA. Hence stakeholder participation was a major focus of the data collection processes. Stakeholders from different decision-making levels, including national, district and local levels, were thus engaged and their views obtained to establish key components of an effective PSAF for biodiversity conservation in rural areas. Stakeholder engagement was determined by the scope of the study in terms of the location of the study area, the timing and the context within which research questions were investigated as presented in the next sections.

3 SCOPE OF THE STUDY

The study focused on identifying elements for the effective development and application of a SAF for biodiversity conservation in rural areas within the MDTP area on the Lesotho side of the border. The study looked at three pilot areas, which were earmarked by the MDTP for immediate development interventions during the first phase of the project (MDTP) and did not cover the whole MDTP area or other subsequent phases. The study sites are located in Lesotho, a small mountainous country landlocked by RSA (see Figure 4.2). It is one of the poorest countries in the world with an economy depending largely on livestock-based agriculture, remittances from the export of labor resources to RSA, as well as the sale of water to RSA through the LHWP. The mountain grasslands of Lesotho on the eastern boundary with RSA are very rich in biodiversity as indicated earlier.

Also, the results are limited to a specific time within the five-year period of the first phase of the MDTP and do not cover the project for its duration. The results are based on information collected from January 2005 till June 2006. The extrapolation of the study conclusions to other areas and times will therefore require careful consideration.

Figure 4.2: Map indicating the location of Lesotho landlocked by South Africa¹²



Source: Centre for Environmental Management (CEM), 2007.

The MDTP in Lesotho commissioned several consultancies to guide and inform the implementation of its eight components described below. These consultancies and the MDTP components form the context within which this study was conducted.

¹² The arrow points to Lesotho, which is depicted by the pink color while South Africa is the light olive color.

4 STUDY CONTEXT

The context for the study consists of three interrelated aspects:

- The eight components of the MDTP in Lesotho, namely: i) management and trans-frontier cooperation; ii) conservation planning; iii) protected area planning; iv) conservation management in existing protected areas; v) conservation management outside existing protected areas; vi) community involvement; vii) nature-based tourism development; and viii) institutional development;
- Stakeholders and their stakes within various governance levels including international, regional, national, district and local community levels;
- Two consultancy studies commissioned by the MDTP and conducted with this study by a research team consisting of specialists from physical and social sciences, research assistants, data collection supervisors and enumerators. The author was one of the specialists on natural resource management. The two consultancy studies are: i) Participatory Socio-Economic Baseline Survey for the MDTP and ii) Design of a Participatory Monitoring and Evaluation Framework for the MDTP.

This PhD study was intertwined with the three aspects mentioned above and had both practical and theoretical objectives¹³ to meet the information needs of the MDTP and to contribute to theories in sustainability assessment frameworks. To meet the objectives of the study, a combination of research techniques was employed within a broad multi-method approach.

¹³ The study objectives are found in Chapter 1.

5 STUDY METHODOLOGY

The study focused on reflection, learning and motivation towards social change in the sustainability agenda for biodiversity conservation within the MDTP area. Consequently, broad stakeholder participation characterized the overall design and data collection to ensure that the application of SA and the identification of the key elements of a SAF suited the desires and circumstances of stakeholders. The design of the study and related data collection, occurred during the period from January 2005 till June 2006, as mentioned earlier. Knowledge came from the research team (researchers, research assistants, supervisors and enumerators) as well as interested and affected parties. Greenwood & Levin 1998:7 argue that participation *“creates strong general commitment to democratizing the knowledge generation process...generate knowledge necessary to transform the situation, and put the results to work through a participatory process in which everyone involved takes responsibility.”* Later sections outline the research design process and highlight the overall approach, ethical considerations, other methodological issues, sampling and steps followed in the study.

5.1 Overall approach

A qualitative case study approach was applied as the sustainability issues of globally significant biodiversity in the Maloti-Drakensberg Mountains, were studied in their actual environment. Conditions in the study area needed to be understood, so that appropriate sustainability elements could be identified by stakeholders and inform the SAF. While a qualitative approach does not allow generalizations to be made as does a quantitative study, it ensures that depth and detail are captured. A qualitative case-study method was thus used since it is an ideal research strategy when a study answers questions on how, what and why, and if the study is conducted within natural settings (Yin, 2003).

The creation of data gathering tools, data collection and analysis were conducted within the interpretive social scientific tradition. The aim of adopting this paradigm was to:

- allow intimate group effort between researcher and stakeholders;
 - investigate and discover views and understanding of research participants regarding sustainability elements in the study area;
 - effectively integrate public participation into assessment activities, thus allowing for the identification of distinctiveness within case sites.
-
- *Study techniques:* Research questions listed in Chapter 1 were answered using a mixture of techniques comprising literature review, field observations, key informant interviews, group discussions and workshops.
 - *Study participants:* Research participants comprised of stakeholders of the MDTP within multiple decision-making levels covering national, district and grassroots levels in three districts of Lesotho. The types of participants included MDTP staff at national and district levels; members of multiple stakeholder forums created by the MDTP at the national, district and community levels¹⁴; and local community members who were not part of the stakeholder forums.
 - *Procedures for data collection and fieldwork*¹⁵: Six research assistants were recruited, trained and tested on the tools and guides to be used in the field for in-depth interviews, group discussions and workshops. The names of research assistants, the list of participants and the

¹⁴ The three multiple-stakeholder forums are the National Steering Committee (NSC) at the national level, District Steering Committee (DSC) at the district level and the Community Conservation Forum (CCF) at the local community level.

¹⁵ Data collection at the national level used English. The local language, Sesotho was used at the district and local community levels when conducting workshops, interviews and discussions because the author and research assistants were Sesotho speaking. Tools used for interviews, discussions and workshops were translated into Sesotho.

dates on which data collection and fieldwork were conducted are in Appendix 2.

- The author conducted in-depth interviews at the national level in Maseru. At the district and community levels, research assistants conducted interviews. Research assistants worked in pairs for each interview. In the evenings, research assistants presented their written reports to the author, one by one. Where inconsistencies were found, these were ironed out through discussions or additional fieldwork. The author made notes and kept memos.
 - Group discussions were conducted by three research assistants. Two took notes, while the other facilitated discussion. The three research assistants presented their work at the end of the day to the author, following a procedure similar to the in-depth interviews above.
 - Workshops were conducted by the author, assisted by one research assistant. The researcher and research assistant took notes during the workshop, discussed their notes in the evening and compiled a report on the findings.
 - Field investigations were conducted by the author and notes were compiled.
- *Data analysis and report writing:* Data was processed, stored and analysed through a cyclical, ongoing and iterative process until the completion of report writing. Data processing involved transcribing findings by typing text from interviews, field observation notes, workshops and group discussions, then storing these in the form of Word documents. Data analysis methods included the use of memos, categorizing and contextualizing strategies, displays through matrices and graphs (Riley, 1990; Maxwell, 1996). Memos were used where reflections, ideas, and insights about the data were noted for

analysis. Responses from interviews, discussions and workshops were categorized into themes of sustainability assessment as well as participation. Generic and context-specific issues and themes were identified. Themes were displayed using matrices.

5.2 Ethical considerations for the study

Ethical principles such as informed consent, voluntary participation, keeping participants informed and confidentiality¹⁶ were incorporated into the study. Before interviews, workshops and group discussions participants were given information on the purpose of the study, the methodology, duration of the study, their role, and the advantages and disadvantages of being involved in the study, so that they could make informed decisions on whether they wanted to participate or not. Another issue discussed with the participants was that their participation was voluntary and that they could withdraw from the study at any time. Also, they were assured that their identity would be kept confidential and would only be revealed to the study team. The study team provided their contact details in case participants wanted to consult them on matters related to the study and/or study findings. After analysis and report writing, the findings of the study were presented to participants so that they could either endorse or refute them.

5.3 Other methodological issues

Measures involving peer review, triangulation, member checks, and comparison were employed to avoid bias and verify the reliability and accuracy of research results. Related inferences and interpretations made by the author from the results were also included.

- Peer review: To obtain insights and useful challenges, and to verify whether interpretations and conclusions fit the data, presentations were made to colleagues at the

¹⁶ For members of various multi-stakeholder forums of the MDTP such as NSC, and DSCs, confidentiality of their opinions was assured. For members of CCFs and other study participants who were not part of the MDTP structures or forums, their identity as well as opinions were kept confidential, therefore their names are not included in the appendix.

University of the Free State who gave their comments. Also, draft chapters were reviewed by peers and discussed. Some peers were part of the research team involved in the MDTP Consultancy Contract, while others were not.

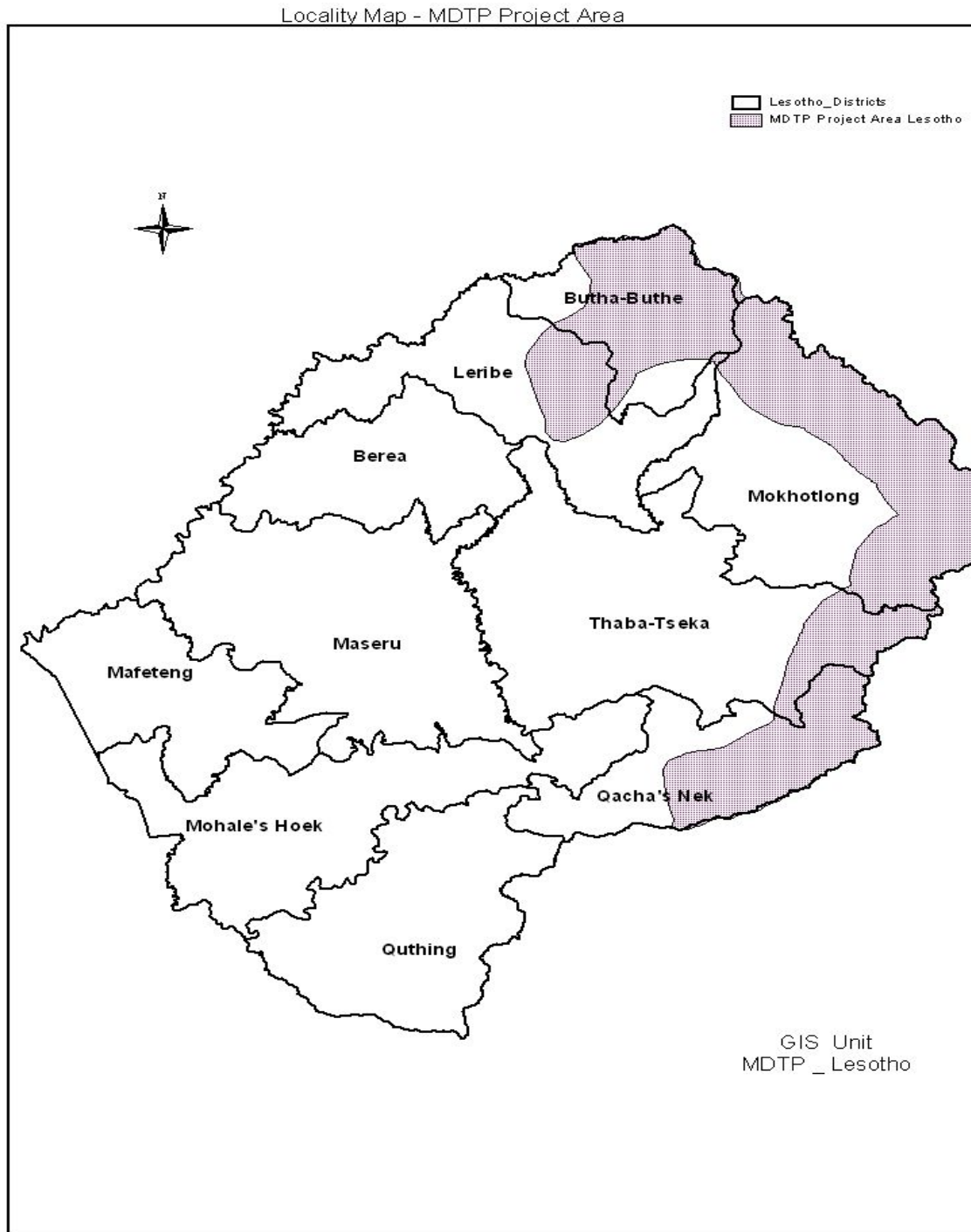
- Triangulation: Three types of triangulation namely, investigator, methods and data, were carried out. To ensure that descriptions of responses were precise and factual, two or three investigators collected data for key informant interviews, group discussions and workshops. Discussions were conducted between the author and research assistants on what transpired during the interviews, discussions and workshops, and notes were compiled. A multi-method approach, which involved multiple measurements, was adopted to increase the confidence and validity of the study findings by exploring sustainability assessment aspects using different methodological viewpoints. Multiple methods such as interviews, field observations, and group discussions were used to establish relationships of cause and effect. Multiple data sources were obtained by involving participants from different levels of governance including national, district and local levels, to understand in depth the sustainability issues and the participatory requirements for each level (Brewer & Hunter, 1989; Riley, 1990).
- Member checking was used to validate whether interpretations accurately documented the viewpoints and meanings of participants. Feedback in report form was given to participants and presentations were made at national level to allow for comments, agreements and modifications and the accurate interpretation of the views of participants.

5.4 Study population and sampling

The study population was from the Lesotho side of the MDTP area. The sample consisted of representatives of government, including national and district levels, in the sectors of agriculture, tourism, economic and development planning, water affairs, environment, local government, police, arts and culture. At the local levels, shepherds, traditional doctors, street vendors, representatives of groups such as women, men, youth, livestock and plant farmers, chiefs, village development councilors, and businesses were included. The main participants were members of various multi-stakeholder forums created by the MDTP at the national, district and community levels, as mentioned earlier. Additional people, who were not part of MDTP structures, were also involved. The aim of sampling was to select information-rich cases and respondents. The study population was selected using a combination of two sampling approaches: purposive and snowball sampling methods (Collins, 1999). Cases identified by the research team and the MDTP were sampled based on MDTP plans to implement interventions in the near future. Four out of five districts (see Figure 4.3) where the MDTP is operating, were purposively selected in consultation with MDTP stakeholders.¹⁷ The names of the selected districts were Leribe, Butha Buthe, Mokhotlong and Qacha's Nek. The fifth district, which was not included in the study because there were no interventions planned for immediate implementation, was Thaba Tseka. Key informants, workshop participants, and participants in group discussions, were purposively selected from the MDTP's District Steering Committee (DSCs) and Community Conservation Forums (CCFs) in the Butha Buthe, Mokhotlong and Qacha's Nek districts. Within these three districts, three areas where the MDTP had planned first interventions were selected: Tsehlanyane in the Leribe district, Sani Top in the Mokhotlong district and Sehlabathebe in the Qacha's Nek district. Although Tsehlanyane is located in the Leribe district, it is managed under the Butha Buthe DSC. These areas are called "development nodes" (see Figure 4.4 and Appendix 3).

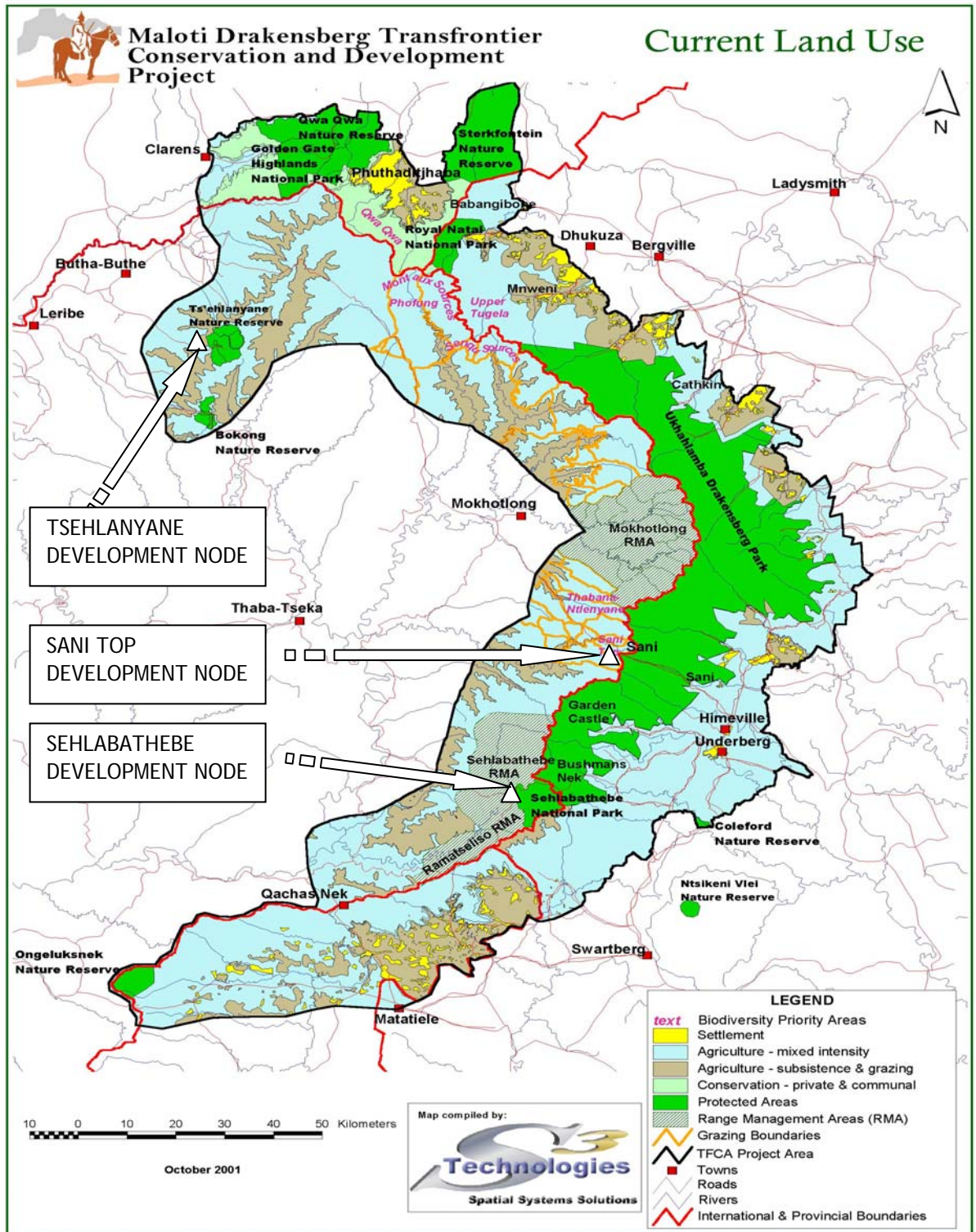
¹⁷ The four districts where MDTP had identified for first-step interventions were selected, leaving one of the five districts because MDTP had not planned immediate interventions.

Figure 4.3: Locality map of the MDTP area in Lesotho



Source: MDTP, 2006.

Figure 4.4: Location of the MDTP project area in South Africa and Lesotho indicating the three study sites¹⁸



Source: Modified by Author from MDTP, 2006.

¹⁸ The location of the study sites is depicted by white triangles and pointed to using arrows.

Key informants, who were not part of the DSCs and CCFs at the local community or village level, were identified through snowball sampling where study participants were asked to help identify people knowledgeable on biodiversity and related sustainability issues in their areas. Details of how the study was conducted and how participants were involved within various activities in the study are explained within three stages.

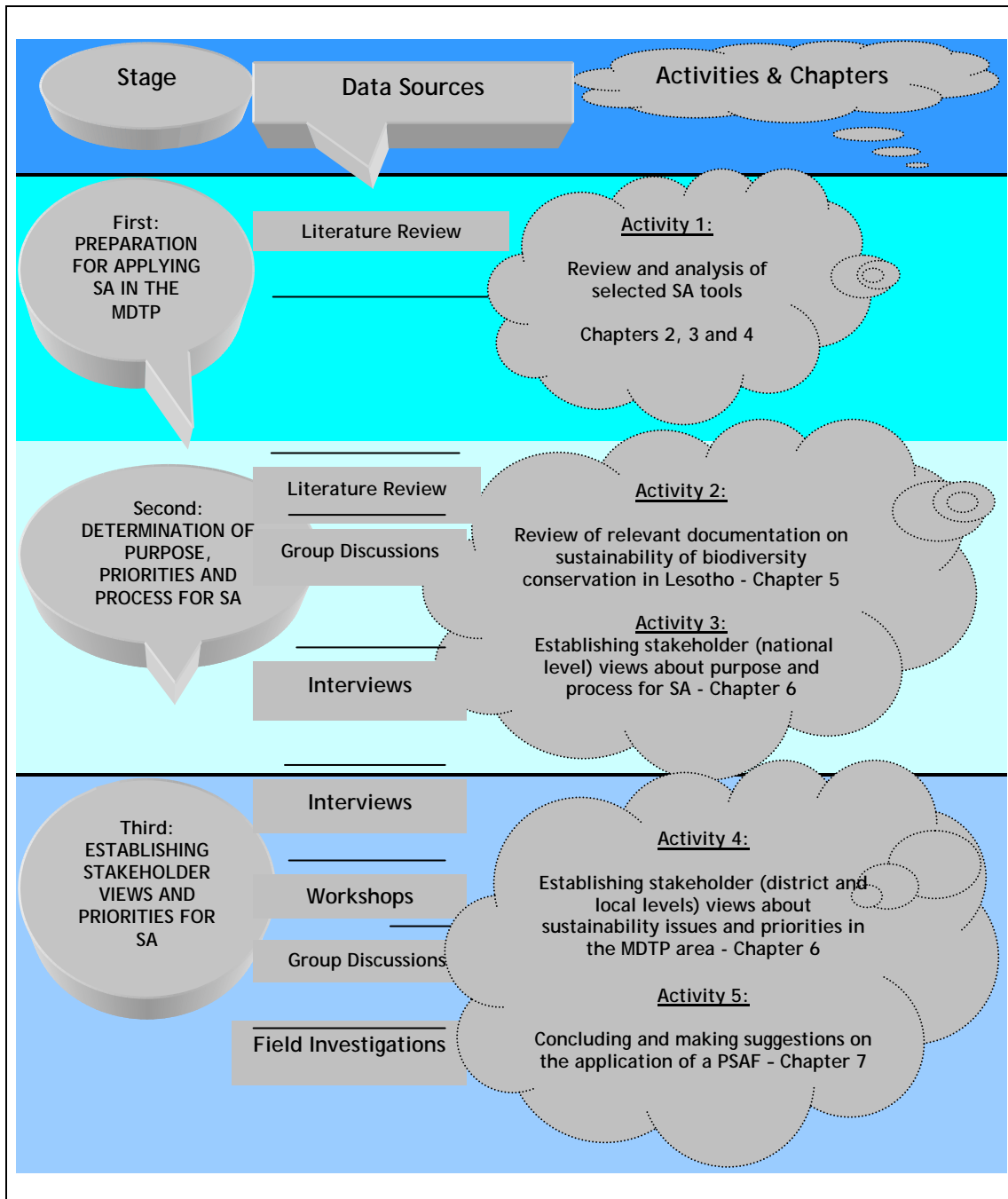
6 STUDY STAGES

A three-stage process, consisting of five major activities as illustrated in Figure 4.5, was used to answer the research questions. The first stage examined the literature to inform preparations for undertaking a SA in the MDTP area. Sustainability Assessment approaches with features that could inform the PSAF for biodiversity conservation in rural areas, were purposively selected, reviewed and relevant lessons compiled. The second stage entailed the determination of purpose and process for undertaking a SA in the MDTP area by identifying context-specific sustainability issues, needs and elements to be incorporated into the SA process. The third stage engaged district level stakeholders in identifying the main sustainability elements to be incorporated into the SAF, using the IUCN SA approach¹⁹. This stage also entailed the involvement of community level stakeholders for their views on progress towards human and ecosystem well being conducive to the sustainability of biodiversity conservation. The Community Sustainability Assessment approach²⁰ was used at the community level. Issues to be addressed for awareness-raising at the community level were identified through the CSA. While these stages are presented successively, some stages overlapped and others were undertaken progressively so that previous steps formed the foundation for those that followed. These stages are described in more detail in the following subsections.

¹⁹ The methodology of the IUCN SA is found in a toolkit by Guijt & Moiseev (2001a; 2001b; 2001c).

²⁰ The tool used for the GEN CSA is found in GEN (2000).

Figure 4.5: Stages and activities for exploring application of participatory sustainability assessment for biodiversity conservation in the MDTP area



Source: Author's construction.

6.1 First stage - Preparation for the application of a sustainability assessment

This first stage formed the foundation of the subsequent stages and identified issues and aspects required for effective participatory sustainability assessment frameworks for biodiversity conservation in a trans-boundary context. An international literature review was the only activity undertaken during this stage. Relevant literature was identified from the Internet and in the University of the Free State (UFS) SASOL Library to discover generic issues and concepts on which to base the application of SA and identify key components of a PSAF in the MDTP area. The review was also used to inform the development of guides for group discussions and interviews, as well as materials for workshops.

6.1.1 Activity 1 - Analysis of sustainability assessment approaches, initiatives and frameworks

Sustainability assessment approaches, initiatives and frameworks were identified, reviewed and analyzed regarding their features that could inform the PSAF for biodiversity conservation in rural areas. These SA approaches were selected on the basis of the availability of information at the time of the study and their relevance to the MDTP situation. Therefore the approaches represent a selection of SA approaches and do not represent a comprehensive review of all SA approaches. The approaches were classified according to their applicability at different levels of governance. This is because the MDTP is a multiple-scale project with sustainability issues and stakeholders from multiple levels of governance. Lessons from a variety of tools were identified and compiled to inform the application of SA in the MDTP context. The SA approaches were categorized into partial system approaches and complete system approaches as discussed earlier in Chapter Three. The complete system approaches were further divided according to their most appropriate decision-making level or levels of application into three groups: sectoral, multiple-level, and single-level approaches. Single level approaches comprised two groups for national or regional levels, and neighborhood or community or village levels. The review covered a total of

thirty-five different initiatives, approaches consisting of: seven international initiatives, thirteen sector-based approaches, two internationally applicable and multiple level frameworks, seven national or regional approaches and six community or neighbourhood approaches.

The main lessons, in terms of strengths and weaknesses, for the application of SA for biodiversity conservation in rural areas, were taken from these approaches, initiatives and frameworks to guide the application of SA in the MDTP area for biodiversity conservation in rural areas. The following section presents the process followed in conducting the study.

6.2 Second Stage: Identifying context specific sustainability issues and priorities

6.2.1 Activity 2 - Literature review on the sustainability of biodiversity conservation in Lesotho

As indicated earlier, the international literature review provided guidance on the concepts and main elements of PSAF for biodiversity conservation in rural areas. It also helped identify approaches that were relevant to the MDTP situation at the time of the study and informed the development of data collection tools. In addition, the international review informed the scrutiny of documents when identifying context-specific issues and priorities for the conservation of biodiversity in Lesotho, with specific emphasis on the MDTP. Documents from libraries within the MDTP and government departments namely, the National Environment Secretariat; Ministry of Tourism, Sports and Culture; Ministry of Economic Planning and Development; Ministry of Agriculture and Land Reclamation in Lesotho were reviewed to establish national priorities related to concepts and theories revealed in international literature. This review focused on biodiversity conservation in Lesotho. It was then devoted to the MDTP, its strategic relevance, its objectives, vision and components, relevant policy background as well as its relevance to national, regional and international

initiatives. Main themes, issues, and priorities were identified and compiled to inform the application of SA, so that elements of the PSAF were in line with the requirements of stakeholder institutions, the national policy framework and related international obligations.

6.2.2 Activity 3 - Establishing stakeholder views on the purpose, priorities and process of sustainability assessment at the national level.

Group discussions and interviews were used to establish stakeholder views concerning the overriding purpose of conducting a SA, the associated priorities and the nature of a participatory process for undertaking SA. Tools and guides for data collection, using group discussions and interviews, are attached in Appendix 4.

Group discussions

Group discussions were held with MDTP staff at the national level to determine the purpose, priorities, preferred process and SA approaches. The IUCN SA approach was selected by the MDTP as the preferred approach for undertaking SA because its strengths matched the needs of the MDTP at the time of the study. To address the weaknesses of the IUCN approach, the author suggested the CSA to complement the IUCN SA process at the community level.

Key informant interviews

Key informant interviews were arranged with the help of the MDTP staff and conducted with some of the members of the MDTP National Steering Committee (NSC) to establish the priorities of their departments concerning the sustainability of biodiversity conservation initiatives. According to Yin (2003), key informants are critical to case study research since they provide facts and opinions on issues and also advise on other relevant people for interviews and other data sources.

These members of the MDTP NSC were interviewed because they were considered to be knowledgeable about the MDTP, its history, aims, mission and objectives. They belonged to the following institutions:

- MDTP
- Ministry of Tourism (Lesotho)
- Lesotho Tourist Authority
- Lesotho Highlands Development Authority
- National Environment Secretariat (Lesotho)
- Ministry of Economic Planning (Lesotho)
- Ministry of Agriculture and Land Reclamation (Lesotho)

From the discussions with MDTP staff the purpose, preferred process, related SA approaches, and priorities for undertaking SA were established and guided the third and last stage of the study, as well as subsequent activities. There was consensus among participants regarding the following:

- The SA process needed to focus on district and community levels as opposed to international and national levels.
- The IUCN SA approach should be applied at the national and district levels to identify the main sustainability priorities, issues, dimensions, elements and indicators.
- At the local community level, SA should focus on reflection and learning and be conducted by members of community conservation forums. The SA activities were carried out using the Global Eco-village Network (GEN) CSA approach as it is ideal for reflection and learning and did not require technical expertise.

6.3 Third stage: Establishing stakeholder views and priorities for sustainability assessment

6.3.1 Activity 4: Establishing stakeholder views at the district and local levels with regard to sustainability issues and priorities in the Maloti Drakensberg Transfrontier Project area

Four main data collection techniques were used at the district and community levels: workshops, group discussions, field investigations and interviews. Tools and guides for data collection using these techniques are found in Appendix 4.

District level

At the district level workshops were held and the IUCN SA approach was applied to identify and prioritise key sustainability dimensions, elements and related indicators. Workshop participants consisted of members of the district steering committees. Dimensions as suggested in the IUCN SA approach, were presented for stakeholders to discuss under these four questions:

- Is this dimension applicable to the sustainability of biodiversity conservation in your area?
- Do you need to make decisions on this dimension? Or, do you need information on this dimension to make decisions related to biodiversity conservation?
- Should assessments of progress towards sustainability address this dimension? Or, should the assessment of proposed plans, programs, projects and other initiatives, address this dimension?
- What priority do you give this dimension compared to others? None? Low? Medium? Or High?

From the selected dimensions, possible elements and indicators were presented by the author to be discussed, revised, modified and / or adopted by workshop participants. After workshops, interviews were conducted with

some members of the DSCs regarding issues that were not captured in the workshop.

Community level

As mentioned earlier, participants at the community level were members of community conservation forums (CCFs). Group discussions, with members of CCFs from three districts, were organized by MDTP district staff. The modified and translated GEN CSA tool was applied as a tool for self-auditing, to assess progress towards or away from sustainability. From this self-audit, participants also identified sustainability issues on which the awareness of the community in general needed to be raised for biodiversity conservation initiatives to be sustainable. Biodiversity conservation in Lesotho is threatened mostly by practices at the local level hence it was vital that awareness-raising, learning and reflection should focus on this decision-making level, to influence biodiversity conservation practices within local communities.

Research assistants facilitated the discussions during the assessment and took notes while members of the CCFs debated, reflected, discussed and made decisions on progress towards sustainable development. The assessment started in the morning and was completed by the evening. The GEN CSA approach has three sections that link human well-being to ecology, economy and culture as well as to spirituality. Each section has seven topic areas and a total of 148 multiple-choice questions, with weights assigned to possible answers. The topic areas are presented in Table 4.3.

Table 4.3: Topic areas for the community sustainability assessment approach

The socio-ecological aspects	The socio-economic aspects	Socio-cultural and spiritual aspects
<ul style="list-style-type: none"> • Sense of place - community location or scale plus restoration or preservation of nature • Food availability, production and distribution • Physical infrastructure, buildings and transport - materials, methods and designs • Consumption patterns and solid waste management • Water sources, quality and use • Waste water and water pollution management • Energy sources and uses 	<ul style="list-style-type: none"> • Openness, trust, safety and communal space • Communication - flows of information • Networking outreach and services • Social sustainability - diversity and tolerance; decision making, conflict resolution • Education • Health Care • Sustainable economics 	<ul style="list-style-type: none"> • Cultural sustainability • Arts and leisure • Spiritual sustainability - opportunities for spiritual practices • Community glue - shared vision, principles, harmony and caring support • Community resilience - ability to respond to crises • Circulatory worldview - responsibility, caring and larger purpose • Peace and global consciousness

Source: GEN, 2000.

After discussions, various aspects were given scores and progress towards sustainability was calculated. Issues for awareness-raising were identified. After each session, research assistants asked participants about what they had learned, using these questions:

- What have you learned about human well-being in your community during this assessment?
- What have you learned about ecosystem well-being in your community?
- Which issues require awareness-raising in your community so that biodiversity conservation initiatives can endure in the long term?

Interviews were also held with some members of the CCFs to clarify issues and collect additional information for the study.

Field observations

Field observations were conducted to examine, survey and confirm conditions in the study area, as defined by stakeholders using an observation guide. Themes used for undertaking field visits are in Appendix 4.

6.3.2 Activity 5 - Concluding remarks and suggestions on how to undertake sustainability assessment for biodiversity conservation in rural areas

Based on the concluding remarks for the preceding activities, lessons for the application of SA for biodiversity conservation were identified by the author and presented to the MDTP staff at national level. In addition the results, interpretations and analysis from the study were validated using peer review and member checks. The draft SA report was compiled and submitted to the MDTP to circulate to stakeholders for comments. Also, four presentations were given on the PSAF at the University of the Free State to obtain feedback and more ideas on the analysis. Participants were study supervisors, colleagues at the Centre for Environmental Management and students enrolled for Masters in Environmental Management for the years 2005, 2006, 2007 and 2008. Draft chapters of the case study were circulated to peers for comments. Peer reviewing and member checking also assisted in identifying gaps and inconsistencies and in addressing these.

Having elaborated on the background to the study as well as the methodology for undertaking a SA case study within the MDTP in Lesotho, the next chapter looks at the main considerations for SA of biodiversity conservation in Lesotho.

CHAPTER FIVE

MAIN SUSTAINABILITY ASSESSMENT CONSIDERATIONS FOR BIODIVERSITY CONSERVATION IN LESOTHO

1 INTRODUCTION

The characteristics of a SAF are determined largely by the context in which it is applied. Hence, identification of context-specific considerations is imperative and is emphasized by many authors (Buselich, 2002; Dalal-Clayton & Sadler, 2004; Pope *et al.*, 2004; Gibson *et al.*, 2005; UNEP, 2006). As explained in previous chapters, a sustainability assessment framework is a tool for structuring, integrating and presenting information that describes, analyses and compares diverse sustainability effects. The parts and aims of a SAF are deduced from context specific legislation, policies, strategies, plans and programs, baseline information and sustainability problems. This study deals with biodiversity²¹ conservation²² in rural areas, using the MDTP area in Lesotho as a case study. Consequently, this chapter explores the main elements of biodiversity conservation in the rural areas of Lesotho to aid the identification of the context-specific parts and aims of a SAF.

²¹ This study adopts the definition of biodiversity used by Article 2 of the Convention on Biological Diversity (CBD): “*the variability among living organisms from all sources including 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*” (CBD, 1992 -(www.biodiv.org)).

²² CBD Article 2 states that “*conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations and species*” includes rehabilitation of degraded ecosystems while sustainable use refers to “*the use of the components of biodiversity in a way and a rate that does not lead to long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations*” (CBD, 1992). For the purposes of this study conservation encompasses both sustainable use and protection as used within the World Conservation Strategy (1980).

This chapter begins with the global significance of biodiversity with emphasis on rural areas as an introductory background. The next section deals with a general overview of Lesotho and focuses on underlying factors that impinge on the sustainability of biodiversity. This is followed by a section analyzing the main features of biodiversity in Lesotho in terms of hotspots, species extinction and related threats. After this, a section that further elaborates on the significance of biodiversity in the context of Lesotho by outlining and analyzing international, regional and national responses to biodiversity conservation follows. The last section presents concluding remarks.

1.1 Significance of biodiversity

The significance of biodiversity and the implications of biodiversity loss are extensively acknowledged internationally (UNDP *et al.*, 2000; Biodiversity in Development Project 2001a; 2001b; UNDP *et al.*, 2003; UNEP, 2004a; MA, 2005; WRI *et al.*, 2005; UNEP, 2008) and regionally (SADC, 1996; New Partnership for Africa's Development (NEPAD), 2003; SADC, 2004). Hence, biodiversity conservation is among the priorities within sustainability discourses worldwide. Biodiversity is viewed as the source of life on earth and underpins ecosystem services required for human well-being (MA, 2005). It is required for almost all development activities; thus it is regarded as a resource base and a key component of the natural capital stock for development (Biodiversity in Development Project, 2001a; 2001b; UNEP, 2005; 2008). Recent emphasis on biodiversity concentrates on the potential role it can play in poverty alleviation by providing environmental income (WRI *et al.*, 2005) and ecosystem services (MA, 2005), especially in rural areas. The Secretariat of the Convention on Biological Diversity (2006:ii) refers to biodiversity as the "*most precious living resource*" and notes that its management is "*one of the most important and critical challenges facing humankind today*". Current and future human generations depend on biodiversity and its ecosystem services for their

existence. Biodiversity is thus denoted as "*the very web of life*" (UNDP *et al.*, 2003) or "*life on earth*" (MA, 2005). All these perspectives echo the view that biodiversity is indispensable to life.

However, biodiversity is facing unprecedented degradation in many parts of the world, including Lesotho. Biodiversity degradation and associated species extinction threatens human existence because it diminishes the capacity to supply ecosystem services for human well-being (Biodiversity in Development Project, 2001a; 2001b; UNEP, 2004a; MA, 2005; UNEP, 2006; WRI *et al.*, 2005). Estimates on current extinction rates far exceed extinction rates of geological times by a range of 1 000 to 10 000 times. Loss of habitat and over-harvesting are major impacts threatening extinction of almost a quarter of mammal species and half of plant species worldwide. Notably, the most spectacular extinction rates have occurred in the recent century. For instance, Box 5.1 reveals that within the two decades between 1960 and 1980 37% of wild areas were lost in developing countries. About 20% of tropical forests have disappeared during the three decades between 1960 and 1990. Also 50% of wetlands worldwide were lost within a span of eight years since the 1990s (Biodiversity in Development Project, 2001a; 2001b). This loss of biodiversity is also supported by recent estimates by MA (2005), IUCN (2001), and UNEP (2007a) indicating that there is an increase in the rate of extinctions and the number of species under threat.

Box 5.1: Examples of main biodiversity loss trends for ecosystems, habitats and species

- Some 37% of wild-lands in developing countries were lost in the 20 years between 1960 and 1980.
- Up to 20% of tropical forests have disappeared in the 30 years between 1960 and 1990.
- More than 50% of 14 biomes in the world have between one-fifth and half of their surface areas converted to croplands.
- Some 50% of wetlands worldwide were lost in the eight years since 1990.
- Worldwide, 35% of coral reefs are threatened with extinction in the next 30 years, through sedimentation and unsustainable use.
- At present, 6% of the land's surface comprises man-made deserts, which are increasing annually at the rate of 60 000 km².
- About 70% of irrigated and rain-fed croplands and rangelands are degraded in Africa, Asia and Latin America.
- Roughly half of inland water habitats are estimated to have been changed within in the 1900s. Similarly, about 60% of the main rivers of the world have been fragmented by the damming and diverting of water for both inter- and intra-basin transfers. Furthermore, some of the rivers become dry due to withdrawals of water.
- Current extinction rates are postulated to be about 100 times more than rates in the fossil record and these rates might increase to up to 1 000 to 10 000 in the near decades.
- About 30% of amphibians, 23% of mammals and 12% of birds are threatened.

Source: Biodiversity in Development Project, 2001a; 2000b; MA, 2005; UNEP, 2007a.

The action plan for the environment initiative of NEPAD (2003) and the SADC biodiversity strategy, both underscore the significance of biodiversity for socio-economic development in Africa. Notably, six of the 25 biodiversity hotspots in the world are found in Africa. One of these hot spots is located in the Maloti Drakensberg Transfrontier Area that is used as a case study for this study. There is more than 50 000 known plant species, 1 500 bird species and 1 000 mammals in Africa. On the other hand, *“a significant portion of these biodiversity resources is either endangered or under threat of extinction. The major threats to Africa's biodiversity reserves are due to natural habitat loss,*

loss of species and subspecies, over-harvesting of natural resources and lack of recognition of indigenous knowledge and property rights” (NEPAD, 2003:21).

Since this study focuses on biodiversity conservation in rural areas, the next section specifically addresses the significance of biodiversity for rural areas.

1.2 Significance of biodiversity for rural areas

Biodiversity is regarded as a source of life for more than 1.3 billion people who live in severe poverty worldwide²³. It is estimated that the rural poor make up to 75% of poor households worldwide (WRI *et al.*, 2005). The importance of ecosystems for sustaining the livelihoods of the rural poor has been widely acknowledged since the Rio Earth Summit in 1992. Also, direct dependence of the rural poor on ecosystems is increasing. Consequently, impacts of biodiversity loss are more severe on the poorest people of the world because their livelihoods depend directly on the biodiversity of genes, species and ecosystems (International Fund for Agricultural Development (IFAD), 2002). Effects of increasing pressures on biodiversity affect rural areas detrimentally, especially in developing countries, because up to 80% of the poor reside here. It is estimated that 80% of the rural population in Africa depends to a certain extent on products harvested from biodiversity (UNDP *et al.*, 2000, 2003; MA, 2005; 2005; WRI *et al.*, 2005).

Effective management of biodiversity and its ecosystem services is imperative, particularly for people living on marginal lands²⁴ in developing countries, including Lesotho. This is because the number of people living on marginal lands in developing countries is about twice the number of those living on good

²³ Severe poverty: People who live on less than 1 US dollar per day.

²⁴ “Marginal lands may be arid, steeply sloped or have low natural soil fertility thus having limited agricultural potential. The productivity of these lands tends to swing greatly due to changing conditions. They are often prone to drought and highly vulnerable to land degradation, erosion, floods and landslides. They are sensitive to changing land use patterns and increased population pressure making them require careful management” (UNDP *et al.*, 2000:38; 2003:16).

land. It is estimated that 325 million poor people live on favored lands, while 630 million people subsist on marginal lands in developing countries (UNDP *et al.*, 2001, 2003; WRI *et al.*, 2005). The survival of the majority of poor people in developing countries, including Lesotho, depends on areas of low resource productivity and highly vulnerable marginal lands such as steep mountain slopes. The significance of biodiversity for rural areas indicates a need for a sustainability assessment framework to guide information requirements for effective decision-making. This is imperative for managing biodiversity so that it continues to provide ecosystem services for current and future generations.

Having provided a broad perspective on the significance of biodiversity, the next section gives a general overview of Lesotho. This is essential because this study concentrates on the Lesotho side of the MDTP area in exploring requirements for a participatory sustainability assessment framework for biodiversity conservation in rural areas.

2 GENERAL DESCRIPTION OF LESOTHO

2.1 Physical features

Lesotho is a small mountainous country in Southern Africa, which is completely landlocked by its only neighbor, South Africa as depicted earlier in Chapter Four, Figure 4.2. It has a surface area of roughly 30 300 square kilometers with about a quarter being the lowlands region, while the highlands constitute the other three quarters. Hence Lesotho is commonly referred to as “the mountain kingdom” or “kingdom in the sky”. The mountainous topography of Lesotho presents a challenging terrain and limits the availability of arable land to 9% of the country’s surface area. The height of the Maluti Drakensberg Mountains ranges between 2 700 to 3 400 meters. The rural highlands in these mountains are less developed and have severe winters due to heavy snowfalls. This restricts basic health services and food supply to the mountain inhabitants.

This mountainous area is a source of water supply for two main rivers, the Orange River and the Tugela River, resulting in Lesotho being regarded as “the sponge of Southern Africa” or the “water factory of Southern Africa”. Provision of water by water ecosystems of the MDTP area is a major ecosystem service, with both national and regional significance (MDTP, 2006, 2007a).

2.2 Population

The population of Lesotho consisted predominantly of young people in 2005. Approximately 40% of the population was under 15 years old while roughly 5% was over 65 years old. It is estimated that by 2015 the proportion of people under 15 years old will be lower (UNDP, 2007). Generally, population statistics for Lesotho reveal a declining trend since the 1990s. The annual population growth rate of 2.8%, which prevailed during the decade 1976 to 1986, has decreased to 2.6% since 1999, mostly due to HIV/AIDS. This declining trend is also echoed by UNDP (2006; 2007), estimating that between 1975 and 2005 the annual growth rate was 1.8% while it will be 0.6% between 2005 and 2015. According to the World Population Data sheets of 2006 and 2007, the most recent and current estimates reveal that the population of Lesotho was 1.8 million in 2006, with an annual growth rate of 0.1%. This indicates a drastic decline from the population that was estimated at 2.4 million in 2003 NES (2004). On the other hand, inside the country population growth for urban areas is about 6% annually, due to rural to urban migration. Still, the majority of people in Lesotho live in rural areas with population estimates for people residing in rural areas ranging between 84-87% (NES, 2004; PRB, 2006; 2007). There has been an increasing trend towards urbanization. For instance, UNDP (2006; 2007) indicates that in 1975 the urban population constituted 10.8% of the total population. This value increased to 18.7 in 2005 and is projected to increase to 22.0% by 2015. These values indicate that the number of rural inhabitants in Lesotho will remain significantly higher than in urban areas. The

average population density is 69 per square kilometre for the highlands and 745 for the lowlands.

The decreasing population puts less pressure on biodiversity and ecosystem services such as food, shelter, medicinal plants and settlement areas. However, population decrease is unlikely to have a positive impact on biodiversity sustainability because there are numerous other factors with detrimental effects on biodiversity. For instance, limits on the sustainability of biodiversity are imposed by the characteristic low percentage of arable land, amounting to only 9%, as highlighted earlier. Furthermore, landlessness in rural areas coupled with escalating unemployment leads to more dependence on biodiversity, as well as settlement encroachment on biodiversity-rich rangelands. As discussed earlier, the need for land puts pressure on fragile marginal lands on steep mountain slopes, leading to habitat destruction due to soil erosion and consequently, to biodiversity loss.

2.3 Economy

Lesotho is classified as a country with medium human development index (HDI) and ranks 138 out of 177 countries, with a HDI value of 0.549 (UNDP, 2007)²⁵. In 2005 it was classified as one of the least developed countries and was ranked 149 out of 177 countries (UNDP, 2005). Water is the main natural resource and referred to as Lesotho's 'white gold'. Water became a key booster of the economy, especially during the construction phase of the Lesotho Highlands Water Project during the 1980s. The textile industry is also a key economic sector that contributed 15% of the country's GDP in 2004 (NES, 2004).

²⁵ UNDP (2008) states that "*the HDI – human development index – is a summary composite index that measures a country's average achievements in three basic aspects of human development: health, knowledge, and a decent standard of living. Health is measured by life expectancy at birth; knowledge is measured by a combination of the adult literacy rate and the combined primary, secondary, and tertiary gross enrolment ratio; and standard of living by GDP per capita (PPP US\$).*" High HDI represents high human development with a HDI value of 0.800 and above; medium HDI refers to medium human development with a HDI values ranging from 0.500 to 0.799; low HDI denotes low human development with HDI values below 0.500. UNDP, 2007:356.

Subsistence farming and animal husbandry are the main economic activities for the majority of the population. Conversely, there has been a continuous decline in crop production in Lesotho since the 1970s. Furthermore, household income has decreased due to the increase in retrenchments of mine workers in South Africa. Unemployment is estimated at 45%, with poverty and malnutrition more prevalent in rural areas (NES, 2004).

2.4 Poverty

According to UNDP (2006; 2007) and PRB (2006; 2007), the proportion of households living below one US\$ was 56.1%, while those living below two US\$ was 36.4%. Poverty levels have remained relatively unchanged over the past decade. For instance, UNDP *et al* (2000) indicates that the national poverty percentage for Lesotho in 1997 was 49.2%, with 53.9% and 27.8% for rural and urban areas respectively. Hence Lesotho has initiated several responses aimed at poverty reduction. Three main responses include the formulation of a country vision (Vision 2020), a Poverty Reduction Strategy Paper (PRSP) and the Millennium Development Goals report.

In Lesotho, income distribution is highly skewed, with the poorest 10% of the population commanding less than one percent of the total income, while the richest 10% commands more than 50% of the total income (UNDP, 2005). It is estimated that the *“gap between the wealthy (high income groups) and the poor (low income groups) is growing - possible doubling every twenty years”* (NES, 1999:206). Income disparities are even more pronounced between rural and urban areas, with urban districts showing higher income levels than rural districts. Furthermore, poverty and vulnerability levels are higher for rural and mountainous districts than for the urban lowlands districts. Another disparity is related to gender, where female-headed households are

poorer than male-headed households. This is due to the traditional setting, where men are providers or breadwinners and owners of land.

Over the past ten years, from 1997 to 2007, poverty has been worsening in Lesotho and has resulted in extreme food shortages. The causes are a combination of high unemployment levels, increasing land degradation and soil erosion, recurrent weather-related disasters (droughts, frosts), impacts of the HIV/AIDS pandemic and retrenchments of Basotho workers from South African mines. Escalating poverty is placing more demands on already stressed and threatened biodiversity and ecosystem services. Furthermore it *“deprives the country of the human resources needed to carry out sustainable environmental programmes, and creates a shortsighted and narrow planning atmosphere which fails to consider environmental impacts due to pressures of meeting immediate, basic human needs”* (NES, 1999:206).

2.5 Health

HIV/AIDS is the most urgent health challenge of Lesotho. Notably, Lesotho is ranked among the top fifteen countries in the world with regard to the prevalence of HIV/AIDS. The percentage population of adults aged between 15 and 49 who are living with HIV/AIDS in 2005, was the third highest in the world, estimated at 23.2% (PRB, 2006). HIV and AIDS related deaths plus orphaned children detrimentally affects economic production and fuels the escalation of household poverty. HIV/AIDS is also mainly responsible for the reduced life expectancy that has further negative impacts on the economy. Between 1970 and 1975 the life expectancy at birth in Lesotho was 49.0 years. It has declined to 44.6 years from 2000-2005. The HIV/AIDS pandemic threatens to reverse all the hard-won key socio-economic gains made in Lesotho since independence. Having a predominantly rural population, the majority of Lesotho citizens depend on biodiversity and related ecosystem services for food, employment and health, especially medicines.

An investigation into the requirements for an effective SAF for biodiversity conservation and sustainable use for rural areas in Lesotho needs to consider and integrate factors such as poverty eradication, provision of employment and improvements in health. Table 5.1 summarizes the most important socio-economic indicators discussed above.

Table 5.1: A summary of the most important socio-economic indicators for Lesotho

Aspect	Indicator	Value
Population	Population in millions	1.8 million in 2006
	Annual growth rate	0.1% in 2006
	Proportion of people younger than 15 years	40% in 2005
	Proportion of people older than 65 years	4.7 in 2006
Economy	HDI rank	138 out of 177 countries
	Unemployment rate as % of total labour force	39.3% in 2004
Poverty	Proportion of households living below one US\$	56.1% in 2007
	Proportion of households living below two US\$	36.4% in 2007
Health	HIV/AIDS prevalence (% adults 15-49 years infected)	23.2% in 2007
	Life expectancy at birth	44.6 years for 2000-2005

Sources: NES, 1999; UNDP, 2004; UNDP, 2005; 2006; 2007; PRB, 2006; 2007.

An overview of Lesotho in terms of physical features, population, economy, health and poverty, as briefly presented above, provides a context for the underlying factors that impinge on biodiversity to be considered within a SAF. The context specific components of a SAF such as principles, trade-offs and criteria, need to be established through stakeholder engagement. A broader background to the biodiversity situation in Lesotho is the subject of the following section.

3 AN OVERVIEW OF BIODIVERSITY IN LESOTHO

This section analyses several aspects of biodiversity conservation in rural areas in Lesotho. It begins with a description of the main ecological zones of Lesotho and their biodiversity features. This is followed by the main threats to biodiversity in Lesotho, categorized into natural and human-induced factors.

3.1 Ecological zones in Lesotho

Lesotho forms part of the grassland biome. About 16% of the grasslands in Lesotho are classified as being degraded. Also, there is a pronounced increase in rangeland deterioration indicated by the invasion of Karoo bush, estimated at 12% (NES, 1999). Lesotho is classified into four main ecological zones on the basis of landforms: lowlands, highlands, foothills and Senqu valley. However, this classification fails to acknowledge forest patches, wetlands and vegetation differences, hence it is a poor classification from a biodiversity perspective. The most useful classifications for biodiversity purposes are related to the grassland vegetation types of Lesotho. Consequently, several studies have been conducted on the ecology of Lesotho over the past century with regard to its types of vegetation (see Box 5.2). These studies have resulted in a variety of classifications.

Box 5.2: Main biodiversity initiatives related to the vegetation of Lesotho

- Three-fold classification of the Maloti area into Seboku grassland for mountain valleys, Letsiri Grassland for the summits and the Sehalahala Scrub for the north facing slopes. Conducted in 1938 by Staples and Hudson.
- Four veld types for Lesotho by Acocks done in 1950 and revised in 1975. The majority of the Maloti area is classified as the Themeda-Festuca Alpine veld. Some small areas in the Maloti and foothills are classified as Highland Sourveld; much of the southern lowlands, northern foothills and Senqu valley are described as Cymbopogon-Themeda veld and the Highland Sour to Cymbopogon-Themeda veld transition.
- The bioclimatic unit map of Lesotho by Phillips in 1973 in which Lesotho was classified into nine units according to latitude and rainfall.
- Inventory indicating 68 plant community types of Lesotho and mapped on the Vegetation map of Lesotho by Martin in 1984.
- The vegetation map of Africa of 1981 and 1983 that classify western Lesotho as Highveld grassland, the Maloti summit plateau as the Altimontane or Afroalpine. Also included is the Afromontane centre of endemism.
- Description of centres of endemism using the term “hotspots²⁶” by Cowling and Hiltom-Taylor in 1994. This resulted in the identification of eight different hotspots including the Maloti Drakensberg hotspot in Southern Africa. More than 50% of this hotspot is found in Lesotho. It has the third highest plant species endemism of 30%, beaten by the Succulent Karoo with 35% and the Cape floral kingdom with 68%.
- Revised Acocks work by Low and Labelo in 1996, resulting in a new vegetation map of South Africa, Lesotho and Swaziland. *“Probably most useful work of Low and Labelo are the three vegetation types, Highveld Grassland (mainly represented by ‘Moist Cold Highveld Grassland’ extending to some 1 800 m), Afromontane Grassland (‘Afro Mountain Grassland’ extending from about 1 800 m to 2 500m), and the Afroalpine Grassland (‘Alti Mountain Grassland’ above 2 500 m)”*.

Source: NES 2000a:9-17.

The classification of vegetation by Low and Rebelo in 1996, highlighted in Box 5.2 above, is used to define the characteristics of the Lesotho ecosystem that are presented in Table 5.2. Table 5.2 presents the three main vegetation zones

²⁶ A term “introduced by Meyers in 1988 to describe areas characterized by high species richness and high concentration of endemic species” (NES 2000a:12).

and their subcomponents, their area coverage in square kilometers, percentage of total land area in Lesotho, and comments.

Table 5.2: Main features of Lesotho vegetation zones

Main vegetation zones and their sub components	Area (km ²)	% of Total	Comments
HIGHVELD GRASSLAND			
Grassland and rocky outcrops	1 230	4.1	<ul style="list-style-type: none"> Densely populated, entirely transformed by human activity and settlement; poor agricultural practices have led to soil erosion and gullies. Grassland can be found on steep summits and hillsides that are overgrazed. Presence of Maboella for thatch grass in reserved areas. Small remaining patches of indigenous forest along the river-banks. Plantations of exotic trees, predominantly pine and eucalyptus.
Gully eroded areas	600	2.0	
Indigenous forest	20	0.07	
Exotic wooded areas	20	0.07	
Plantation Forest	90	0.30	
Shrubland and thickets	200	0.61	
Cultivated land	3 700	12.2	
Wetlands	10	0.03	
Open water	10	0.03	
Settlements and roads	1 200	4.0	
AFROMONTANE GRASSLAND			
Grassland and rocky outcrops	7 020	23.2	<ul style="list-style-type: none"> Covers more than half of Lesotho, including most of the Maloti Mountains. Constitutes most significant proportion of the Maloti Drakensberg hotspot. This is where the majority of endemic plant and animal species occur. Until recently, the area of open water has increased due to the Lesotho Highlands Water Project.
Indigenous forest	20	0.07	
Exotic wooded areas	-	-	
Plantation Forest	10	0.03	
Shrubland and thickets	4 800	15.8	
Cultivated land	3 800	12.6	
Wetlands	10	0.03	
Open water	40	0.13	
Settlements and roads	400	1.3	
AFROALPINE GRASSLAND			
Grassland and rocky outcrops	6 680	22.0	<ul style="list-style-type: none"> Severe climatic conditions with snow and frost occurring throughout the year. Few settlements. Area where highest rainfall occurs in Lesotho.
Shrubland	400	1.3	
Wetlands	40	0.13	

Sources: Mokuku, 1999; NES, 2000a; 2000b.

The highest species diversity in Lesotho is found in the Afromontane grassland zone. This is the area where 60% of the globally significant Maloti Drakensberg Transfrontier hotspot is located. This area is the main priority for biodiversity conservation in Lesotho. Conversely, at 0.4%, Lesotho has one of the lowest percentages of protected areas worldwide. WRI *et al.* (2005) rounds off the percentage to zero. Compared to other countries this is indeed a grave situation.²⁷ This means that most of the biodiversity in Lesotho, which includes the majority of the MDTP area hotspot, is not under any formal protection. Furthermore, there is evidence of declining species diversity in Lesotho for mammals, birds and reptiles (Table 5.3).

Table 5.3: Known biodiversity at species level in Lesotho

Group	Number of current species	Number of historical species ²⁸	Total
Mammals	63	19	82
Birds	318	22	340
Reptiles	40	3	43
Amphibians	19		19
Fish	14		14
Invertebrates	1 279		1 279
Plants and Thallophytes	3 092	1	3 093

Sources: Mokuku, 1999; NES 2000a, 2000b.

Historical records indicate that there have been changes in the biodiversity of fauna and flora in Lesotho due to the loss of suitable habitats. NES (1999:xv) reveals that there is *“disappearance and reduction in the number of marshes, spring bogs and reed meadows...all big game has disappeared from Lesotho due*

²⁷ For instance, worldwide Venezuela ranks first with 63% share of its surface area protected, Zambia ranks third with 42%, Tanzania ranks sixth with 38% and Botswana ranks thirteenth with 30% (PRB, 2006).

²⁸ Historical species refers to those species whose records occur earlier than 1950 (NES, 2000b).

to over hunting and habitat invasion by humans, leaving only five species of large mammals limited to mountain areas. Sixteen bird species have become extinct since the 1940s. Records show that of the 285 recorded species of birds, 176 are classified as "rare".

3.2 Biodiversity conservation threats in Lesotho

The threats to biodiversity in Lesotho are outlined in NES (2000a) under two categories of natural and human induced. These are briefly presented in sub-sections 3.2.1 and 3.2.2. It is important to note that the impact of these threats to biodiversity is not linear but complex. This is because numerous factors interact to determine the impact of these threats, such as size of the ecosystem and species abundance. Also, interactions between the various threats result in cumulative and synergistic effects on biodiversity.

3.2.1 Natural threats to biodiversity in Lesotho

Natural threats to biodiversity in Lesotho comprise:

- Abnormal climatic conditions such as drought, frost, hail and snow that impinge on species composition. For instance it is noted that after the 1932-1933 drought *Chrysocoma* dominated the grasslands in Lesotho.
- Although not limited to Lesotho, it is predicted that the results of global warming are likely to cause species that have evolved in cold climates to be replaced by species that prefer warm climates.
- Lightning induced fires pose a threat as Lesotho's summer rainfall is accompanied by thunderstorms and lightning. It is estimated that Lesotho has one of the highest densities of lightning strikes in the world, with a density of ten ground lightning strikes per kilometer. Due to overgrazing, lightning induced fires are currently less likely. However, once the overgrazing problem is under control, this threat will need to be considered.

- While predator-prey interaction is an expected natural phenomenon, it is a threat for a disturbed biodiversity such as in Lesotho. This is because predators kill already endangered prey due to factors such as habitat degradation, coupled with hunting by men and their dogs.
- Outbreaks of non-local pests and diseases to which animals and plants in Lesotho do not have resistance, also pose a serious threat to biodiversity. Historical records indicate deaths of local animal and plant species due to non-local pests and diseases in the 19th century.
- Alien invasive species that have been introduced, such as the grey poplar and silver wattle, have been found to be spreading inside Lesotho and are replacing some indigenous species in some habitats.

While natural threats differentiated above pose a threat to biodiversity in Lesotho, human induced threats are a major cause of problems for both terrestrial and aquatic biodiversity.

3.2.2 Human induced threats to biodiversity in Lesotho

Major threats that are human induced arise from the communal land tenure systems and competition for finite land resources. Needless to say, land degradation is a key problem in Lesotho. Land conservation attempts as analyzed by Esenjor (2005) and revealed by several authors (Mokuku, 1999; MDTP 2006; 2007a) have generally failed to curb land degradation in Lesotho. According to NES 2000a:90, *“the most significant human induced threats to biodiversity are the destruction of habitats and ecosystems which are home to many plants and animals... Natural ecosystems and habitats are overexploited and overutilized through overgrazing of rangelands, mismanagement of sensitive ecosystems such as wetlands, over-harvesting of medicinal plants and animals, poor agricultural practices and poor biodiversity conservation attempts. Compounding the problem further is the Basotho attitude of use, use and use without ever replenishing what was used”*.

Human induced biodiversity threats in Lesotho include:

- The communal land tenure system, which promotes over-exploitation of land and other common resources.
- Destruction of habitats and ecosystems due to poor crop production practices and over use of pastures.
- Over exploitation or non-sustainable use of biological resources, such as wild plants and animals, particularly for food and medicines. A plant use study, conducted in Phase 1B of the Lesotho Highlands Water Project, revealed that 44 plants are used by rural communities for food and 207 for medicinal purposes. There has been an increase in the harvesting of medicinal plants for cross-border trade. It has been estimated that *“as many as 100 000 plants are lifted every week by 20 000 diggers each harvesting an average of 5 plants a week ... this represents 5 million plants per year.”* Wild animals are hunted for medicines, meat and skins to make clothes. This practice threatens the existence of already threatened species even further (NES 2000a:97).
- Invasive alien species, which especially threaten biodiversity, include water-weeds, which were introduced by humans.
- There has been a loss of genetic diversity, as imported varieties are preferred to domestic plant and animal strains.
- The Lesotho Highlands Water Project has had a positive impact on biodiversity by providing documentation on biodiversity in its area. However, improved access roads make it much easier to harvest medicinal plants, including the endemic Spiral aloe, which is used for both decoration and medicinal purposes. To address this impact the LHWP has established nature reserves and a botanical garden.

These types of threats to biodiversity are well known in Lesotho, the key challenge is how to address these threats effectively to ensure the sustainability of biodiversity to meet international requirements and human

needs. The following section elaborates on the main approaches instituted to address biodiversity threats in Lesotho.

4 BIODIVERSITY MANAGEMENT RESPONSES IN LESOTHO

The types of responses related to biodiversity management in Lesotho are discussed within subsections 4.1 to 4.5 under these themes: main measures, projects, and policy aspects.

4.1 Main initiatives to manage biodiversity in Lesotho

Three main types of initiatives are used to manage biodiversity in Lesotho (see Table 5.4). These include both *in situ* and *ex situ* conservation approaches²⁹ plus the demarcation of sustainable use areas:

- *In situ* conservation is done through protected areas;
- *Ex-situ* conservation is accomplished using mechanisms such as botanical gardens, an arboretum, and seed collection of indigenous plants; and
- Demarcation of sustainable use areas is achieved by traditional reserved grazing areas known as *maboella* and range management areas³⁰ (Mokuku, 1999).

²⁹ *In situ* conservation refers to conditions where genes and species are found in the surroundings where they evolved while *ex situ* conservation is where components of biodiversity are outside the habitats in which they evolved (CBD, Article 2).

³⁰ The former Range Management Areas (RMAs) are now referred to as Managed Resources Areas (MRAs) or Environmental Resource Managed Areas (ERMAs) (Parrow, 5 November 2006 - personal communication).

Table 5.4: Biodiversity conservation initiatives in Lesotho

IUCN category	Name of protected area	Key Management objectives	Area in hectares
II	<ul style="list-style-type: none"> Sehlabathebe Wildlife Sanctuary and National Park Masitise Nature Reserve Tsehlanyane Nature Reserve 	Ecosystem protection and recreation	6475 20 5300
III	<ul style="list-style-type: none"> Thaba Bosiu Mountain Liphofung National Monument National University of Lesotho Botanical Garden Proposed Qoaling Botanical garden Ministry of Agriculture arboretum 	Conservation of specific natural or cultural features	150 4 1.5 30 0.1
IV	<ul style="list-style-type: none"> Maloti Drakensberg Transfrontier Area 	Conservation through management intervention	5 000
V	<ul style="list-style-type: none"> Muela Reserve 	Land conservation and recreation	45
VI	<ul style="list-style-type: none"> <i>Maboella</i> areas set aside for future animal grazing Sehlabathebe Range Management Area (RMA) Pelaneng/Bokong RMA Malibamatso/Matsoku RMA Qhoali RMA Mokhotlong/Sanqebethu RMA Liseleng RMA Ramatseliso RMA Bokong Nature Reserve Forest reserves 	Sustainable use of natural ecosystems	185684 is the total area for the RMAs 1972 > 7000

Sources: Mokuku, 1999; NES, 2000a; 2000b; MDTP, 2007a.

Biodiversity in Lesotho remains threatened in spite of these measures. These biodiversity measures plus a series of projects have been found to be inadequate in addressing biodiversity threats in Lesotho. Most authors purport that conservation measures in Lesotho have had little success. The sustainability of conservation initiatives remains a key dilemma in Lesotho

(Mokuku, 1999; NES, 1999; 2000a; 2000b; 2004; Esenjor, 2005). Hence there is a need to investigate the main elements to facilitate, promote and contribute to the sustainability of biodiversity. This study addresses this need by identifying aspects of a sustainability assessment framework necessary for measuring, organizing, and interpreting information about the sustainability of biodiversity for decision-making levels across and between stakeholders at national, district and local levels. This is essential as biodiversity management requires relevant and timely information for decision-making. Bell & Morse (2003) also emphasize the importance of timely information in sustainability initiatives and assert that measurement is a prerequisite for effective environmental management.

NES (2000a) depicts biodiversity conservation initiatives in Lesotho according to the IUCN classification of protected areas, their names, key management objectives and area coverage in hectares as presented in Table 6.4. Biodiversity conservation for sustainable use of natural ecosystems constitutes the largest area followed by biodiversity conservation for ecosystem protection and recreation. While the number of formal conservation areas in Lesotho increased from two to seven in the 1990s, only a small percentage of land area (between 0.4% and 0.7%) is protected as gazetted areas (also see par 3.1). The sustainable use areas cover about 7% of the total land area. Despite various measures, biodiversity threats continue due to several issues described by Mokuku (1999) as:

- Failure to collect, analyze and use traditional knowledge and management systems to contribute towards management of biodiversity.
- Lack of comprehensive national legal framework to deal with biodiversity conservation issues.
- Fragmented approach in dealing with biodiversity that is characterized by biodiversity issues being managed by different sectors.
- Lack of coordination of biodiversity management measures.
- Poor enforcement of existing laws due to lack of capacity and conflicts.

Mokuku (1999) further proposes measures such as environmental education and sensitization, enforcement of existing laws, provision of incentives and community participation to help manage biodiversity sustainably. He argues that a lack of appropriate community participation is a key constraint to the sustainability of biodiversity in Lesotho. This viewpoint is also supported by Esenjor (2005) as a key requirement for effective conservation initiatives in Lesotho. Furthermore, Mokuku recommends that *“research, monitoring and evaluation and assessment activities are required to enable informed decision-making and proper management”* (NES, 1999:xvi). This study contributes to this need by adopting a participatory approach that engages various stakeholders, including grassroots communities, in identifying elements of a sustainability assessment framework for biodiversity conservation in Lesotho’s rural areas. This study is also aligned with, and builds on, the work done through several projects that address monitoring and assessment of biodiversity in Lesotho as presented in the subsequent section.

4.2 Examples of some biodiversity projects in Lesotho

The projects dealing with biodiversity in Lesotho are described briefly in Box 5.3. Examples of biodiversity monitoring and assessment projects in Lesotho included in this study are related to the Lesotho Highlands Water Project area and the Conserving Mountain Biological Diversity in Southern Lesotho (CMBSL) project. While both projects adopted a participatory approach that involved stakeholders through community conservation forums and multi-stakeholder forums, the issue of designing a sustainability assessment framework was not considered. For instance, the CMBSL designed manuals and built the capacity of district and local level stakeholders on aspects such as monitoring and evaluation, conflict management, HIV/AIDS, community participation methodologies, financial management and participatory strategy. This is a commendable initiative towards integrating socio-economic aspects into

biodiversity conservation, since a holistic approach was adopted. On a more positive note, the MDTP is building on the structures and achievements of the CMBSL. This is a very cost-effective approach, since it recognizes and uses the institutional memory built by the CMBSL. In addition, the MDTP is also building upon the experience of prior structures established by the LHWP, in particular the community conservation forums in decision-making related to protected areas.

Knowing the widely acknowledged history of unsustainable biodiversity conservation initiatives and projects in Lesotho, it was expected that sustainability issues would be given prominence. However, it is evident that a sustainability assessment framework was not considered. Similarly, neither did regional biodiversity projects with notable achievements on biodiversity assessment in Lesotho consider the use of sustainability assessment frameworks. On the other hand, the fact that a sustainability assessment was not applied is not surprising as this is a new tool that is still evolving and of which developing countries such as Lesotho have little experience.

Box 5.3: Examples of some biodiversity projects in Lesotho

- **The Lesotho Highlands Water Project** impacted hugely on biological diversity of the highlands, both negatively and positively. Biodiversity was lost through the construction of infrastructure and the impoundment of rivers. However, through environmental action plans, two protected areas were established under this project at Bokong and Tsehlanyane areas. Also, a high altitude botanical garden has been established at Katse. Another positive aspect of the project is the regular monitoring of biological resources in the project area. In addition, the project has initiated projects for the propagation of medicinal plants in community gardens for community use and commercialization. This includes the propagation of the endangered spiral aloe. There is also ex-situ breeding of the Maloti minnow, an endangered species found only in the Lesotho highlands streams.
- **Conserving Mountain Biodiversity in Southern Lesotho (CMBSL)** was financed by the Global Environment Facility (GEF), implemented by the United Nations Development Programme (UNDP) and coordinated by NES. Its focus was conservation and sustainable

use of biodiversity in rangelands, woodland, and wetlands of species of specific importance. Through the CMBSL, one Ramsar site, or wetland of regional importance, was established. This is the only site in Lesotho recognized and protected for its rich diversity of birds and was declared a Ramsar site in 2002. It is located at Letseng la Letsie in the Quthing District. However, there are conflicts with some local communities related to their grazing land near the lake. This is a key sustainability issue.

- **The Southern African Botanical Network (SABONET)**, funded by GEF and UNDP was administered via Regional Networking and Capacity Building Initiatives for Southern Africa (NETCAB) and the Conservation Union Regional Office for Southern Africa (IUCN-ROSA), and deals with capacity building in taxonomy and ensures proper record keeping of all specimens of floristic data that are found in three herbaria in Lesotho. SABONET also helps to improve the herbaria collection.
- **The Service for Environmental Conservation of Biodiversity and for Sustainable Development (SECO-SUD)**, financed by the Government of Italy, seeks to enable Lesotho to further refine strategies for the conservation of biodiversity through the mapping of economically important plants in Lesotho. It also attempts to create a network of collections and to distribute information on plant resources within the SADC region to provide information services in support of decisions in the planning of biodiversity conservation.
- The aim of the **Southern African Biodiversity Support Programme** project is to: improve availability and accessibility of biodiversity information and its application in conservation planning and management; achieve cross-sectoral national and regional cooperation on biodiversity conservation and sustainable use activities; develop national and regional institutional capacity for coordination and implementation of biodiversity conservation and sustainable use activities; integrate effective practices of sustainable natural resource use into national and regional conservation and other planning and programs ; and develop financing mechanisms to ensure the sustainability of the regional support framework.
- **The Wetland Conservation Programme for Southern Africa** resulted in the assessment of wetland condition, types, and threats from 1990 till 1996. The report produced from this work provided a regional program of action for the conservation and sustainable use of wetlands. The second phase of the program focuses on regional training to build the capacity of resource managers in the sub-region for conservation and sustainable use of wetlands.

Sources: NES, 2004:170-171; MDTP, 2007a.

This study also builds on the work of regional biodiversity projects outlined in Box 5.3 above. Although these regional projects are notable achievements on biodiversity assessment in Lesotho, they are not focussed on measuring the sustainability of biodiversity by integrating human and ecosystem elements. Regular stakeholder participation in these projects emphasizes regional and national level stakeholders. Consequently, assessment results for decision-making are organized and disseminated at national and regional levels without mechanisms for involving stakeholders at district and grassroots levels. Taking into consideration that biodiversity conservation in Lesotho is threatened mostly by practices at the local level, it is important that sustainability measurements, analysis and reporting of progress on biodiversity need to inform decision-making at this level also. Hence this study seeks to contribute another perspective by focusing mostly on the district and grassroots levels. This study therefore adopts a multiple scale approach encompassing stakeholders and decision makers from the national, district and grassroots levels.

4.3 Biodiversity policy framework and initiatives in Lesotho

Biodiversity conservation in Lesotho is influenced by a wide range of international, regional and national plans, programs, strategies, policies and legislation. These instruments and initiatives have a bearing on the components of a PSAF as a guide to themes, objectives and priorities for sustainability. These instruments and initiatives also provide criteria to scrutinize the sustainability of existing and proposed activities, plans, projects, programs and policies. Table 5.5 and 5.6 respectively present examples of instruments and initiatives related to biodiversity internationally, regionally and nationally. Lesotho aligns with the objectives enshrined in these instruments, especially the CBD, and participates in more than 20 international environmental conventions and over 12 regional environmental conventions (NES, 1999). Most

importantly, Lesotho needs to provide relevant biodiversity reporting in line with these conventions.

Table 5.5: Examples of main instruments related to biodiversity

International	Continental (Africa), Regional (SADC), bilateral	National (Lesotho)
<ul style="list-style-type: none"> • Ramsar Convention on Wetlands (1971). • World Heritage Convention (1972). • Convention on Conservation of Migratory Species (1975). • Convention on International Trade in Endangered Species of Wild Fauna and Flora (1975). • Convention on Biological Diversity (1992). • International Treaty on Plant Genetic Resources for Food and Agriculture (2004). 	<ul style="list-style-type: none"> • Bilateral treaty on the Lesotho Highlands Water Project between Lesotho and RSA (1986). • Declaration and treaty of the SADC (1992). • Constitutive Act of the African Union (2000). • Revised African Convention on the Conservation of nature and natural resources (2003). • Various SADC protocols on Culture, Information and Sport; Shared Watercourse Systems; Tourism; Trade; Wildlife Conservation and Law Enforcement; Health; Politics, Defence and Security Co-Operation. 	<ul style="list-style-type: none"> • National Environment Action Plan (1989). • Constitution of Lesotho (1993). • National Action Plan to Implement Agenda 21 (1994). • National Livestock and Range Management Policy (1996). • Sixth National Development Plan 1996/97-1998/1999. • National Environment Policy (1996, revised 1999). • National Biodiversity Strategy and Action Plan (2000) - A National Strategy on Lesotho's Biological Diversity: Conservation and Sustainable Use. • Environment Act (2001).

Source: Author's construction.

Table 5.6: Examples of main initiatives related to biodiversity

International	Continental (Africa), Regional (SADC), bilateral	National (Lesotho)
<ul style="list-style-type: none"> • Millennium Development Goals • World Summit on Sustainable Development • Pilot Global Ecosystems Assessment • Millennium Ecosystem Assessment • Global Environment Outlook by UNEP and Collaborating Centers; • World Resources Report by UNEP, UNDP, World Bank and WRI) • Earth Trends by World Resources Institute • IUCN Red Data List and Species Survival Commission Reports • Human Development Report by UNDP • World Development Report by UNDP • Plant and Genetic Resource Assessment and reports on fisheries, forest and agriculture by FAO. 	<ul style="list-style-type: none"> • Creation of transfrontier conservation areas (TFCAs) • New partnership for Africa's development (NEPAD) Action plan for the environment initiative (2003). • Regional Indicative Strategic Development Plan (RISDP) for the Southern African Development Community (SADC) • Environment and Sustainable Development programme • SADC regional environmental education programme • SADC Biodiversity Support Programme 	<ul style="list-style-type: none"> • Vision 2020 • Millennium Development Goals (MDGs) report • Poverty Reduction Strategy Paper (PRSP)

Source: Author's construction.

The main considerations repeated in the instruments and initiatives in Tables 5.5 and 5.6 are elaborated and categorized into regional and national socio-economic and socio-ecological components within subsequent subsections. International and continental requirements are put into operation and implemented through regional and national instruments and initiatives. The international viewpoint is provided by the CBD as depicted in Box 5.4.

However, the requirements of the CBD need to be tailor made for application in a specific context of the MDTP area, taking cognizance of biodiversity priorities and trade-offs at each decision-making level such as national, district and local.

Box 5.4: Main considerations from the CBD which are relevant to Lesotho

- Adoption of measures to avoid or minimize adverse impacts on biological diversity.
- Cooperation between countries on issues of mutual interest, for the conservation and sustainable use of biological diversity; between its governmental authorities and its private sector in developing methods for sustainable use of biological resources.
- Development of instruments - development of national strategies, plans or programs for the conservation and sustainable use of biological diversity or, existing strategies, plans or programs should be adapted for this purpose.
- Integration of the conservation and sustainable use of biological diversity into national decision-making and relevant sectoral or cross-sectoral plans, programs and policies.
- The identification of biodiversity components warranting conservation and sustainable use; the identification of components of biological diversity of importance to its conservation and sustainable use; and processes and categories of activities that have, or are likely to have, a significantly adverse impact on the conservation and sustainable use of biological diversity.
- Monitoring of the components of biological diversity that have been identified and the effects of processes and activities that are likely to have adverse effects on biological diversity.
- Data management, which involves the maintenance and organization of data derived from identification and monitoring activities.
- The establishment of a system of protected areas, or areas where special measures need to be taken to conserve biological diversity.
- The development of instruments such as guidelines for the selection, establishment and management of protected areas, or areas where special measures need to be taken to conserve biological diversity; and necessary legislation and/or other regulatory provisions for the protection of threatened species and populations.
- The regulation and management of biological resources important for the conservation of biological diversity, whether within or outside protected areas, with a view to ensuring their conservation and sustainable use; and of the relevant processes and categories of activities affecting conservation and sustainable use of biological diversity.

- The promotion of ecosystem protection, natural habitats and the maintenance of viable populations of species in natural surroundings; and environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering the protection of these areas.
- The rehabilitation and restoration of degraded ecosystems and the promotion of recovery of threatened species.
- Support to local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced.
- Prevention of the introduction of, and the control or eradication of those alien species that threaten ecosystems, habitats or species.
- The provision of the conditions needed for compatibility between present uses and the conservation of biological diversity and the sustainable use of its components.
- Respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities, embodying traditional lifestyles relevant to the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.
- The protection and encouragement of the customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements.

Source: CBD, 1992.

The main considerations for biodiversity conservation from a regional standpoint are encapsulated in the SADC regional biodiversity strategy that indicates the significance of biodiversity conservation and sustainable use for supporting livelihoods (SADC, 2004). Policy frameworks from international to national, regional and national levels, emphasize similar matters, as depicted in Table 5.7.

Table 5.7: Main socio-economic and socio-ecological considerations for biodiversity conservation from continental, regional and national policy frameworks

Socio-economic considerations	Socio-ecological issues
<ul style="list-style-type: none"> • Promotion and protection of democratic principles and institutions, popular participation and good governance including human rights and social justice. • Combating HIV and AIDS and other deadly or communicable diseases. • Ensuring that poverty eradication is addressed in all activities and programs. • Mainstreaming of gender in the process of community building. • Enabling active participation by local communities in the process of planning and management of natural resources upon which such communities depend, with a view to creating local incentives for conservation and the sustainable use of natural resources. • Employment creation through promotion of optimal use of natural resources; • Formulation of development plans that consider fully ecology, economy, culture and society in order to promote sustainable development; • Improvement of agricultural production and food security by 	<ul style="list-style-type: none"> • Regular assessment, monitoring and reporting on environmental conditions and trends in the region. • Capacity building, information sharing and awareness creation on problems and perspectives in environmental management. • Conservation of natural resources to be part of national and/or local development plans; leading to the achievement of sustainable utilization of natural resources and effective protection of the environment. • Conservation of regional ecosystems and landscapes, endangered, endemic and cross-border migratory species. • Management of water catchments and aquatic ecosystems; • Prevention of extinction of indigenous plant and animal species, especially those distributed across national boundaries. • Management and conservation of the environment through <ul style="list-style-type: none"> ◦ reduction of loss of biodiversity by maintaining existing reserves and moving towards the establishment of new nature reserves and

<p>adopting appropriate farming practices such as encouraging field crops in areas that are agro-ecologically suitable and encouraging appropriate animal husbandry by improving range management through community associations.</p> <ul style="list-style-type: none"> • Achievement of greater self-reliance and increased incomes for livestock owners, while protecting and regenerating the underlying natural resource environment and resource base by: <ul style="list-style-type: none"> ○ elimination of transhumance from the lowlands to the mountains; ○ adjudication of grazing rights within cattle posts; ○ training of livestock owners in sustainable use of natural resources; ○ creation of grazing associations. 	<p>protected areas;</p> <ul style="list-style-type: none"> ○ addressing range management issues by establishing and/or revitalizing grazing associations in collaboration with new local government authorities; and ○ improve the legal policy and institutional framework.
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Source: Author's construction.

The overall application of sustainability assessment for biodiversity conservation in rural areas requires a holistic approach that considers social, cultural, economic, institutional and ecological aspects.

5 CONCLUDING REMARKS

Biodiversity has global, regional, national and local significance as exemplified by the huge number of initiatives at these levels. However, biodiversity continues to be lost at an unprecedented rate. Since biodiversity loss threatens human survival because it underpins ecosystem services on which humanity

depends, the application of SA offers a unique opportunity to address the sustainability issues of biodiversity conservation. Consequently, exploring the application of SA for biodiversity conservation needs to consider the following:

- Integration into SA of the main underlying factors that impinge on biodiversity. These underlying factors include physical features such as a predominantly mountainous and fragile terrain, inadequate arable land that is highly degraded, increasing population in a poor economy with high unemployment and poverty levels, and the plight of HIV and AIDS.
- The main themes, objectives and priorities when applying SA need to be aligned with relevant sustainability issues as per the stipulations of relevant international biodiversity conservation instruments and tools. Instruments and initiatives have a bearing on the development of a sustainability framework and also provide criteria to scrutinize the sustainability of existing and proposed activities, plans, projects, programs and policies.
- Identifying and dealing with conflicts or trade-offs between international policy requirements and local priorities.
- Building on and learning from preceding biodiversity conservation initiatives by incorporating stakeholders effectively within SA processes.
- Adopting a holistic approach that considers social, cultural, economic, institutional and ecological aspects.
- Incorporating sustainability issues from diverse stakeholders across multiple decision-making levels within the MDTP.

This chapter presented an analysis of sustainability issues and priorities for biodiversity conservation from an international, continental, and national policy context. The next chapter is devoted to the findings of a case study where application of participatory SA was explored. It describes sustainability priorities and aspirations for biodiversity conservation as perceived by key stakeholders.

CHAPTER SIX

AN EFFECTIVE SUSTAINABILITY ASSESSMENT FRAMEWORK FOR BIODIVERSITY CONSERVATION IN RURAL AREAS: STAKEHOLDER VIEWS

1 INTRODUCTION

This chapter presents the findings of a case study that explored the application of SA for biodiversity conservation issues within a rural context in the MDTP area in Lesotho. Study participants consisted of i) MDTP staff at national and district levels, ii) members of multiple-stakeholder forums created by the MDTP at the national, district and community levels³¹, and iii) local community members who were not part of the multiple-stakeholder forums³². The findings are based on the application of the IUCN SA approach and the GEN CSA approach described in Chapter 3. The IUCN SA approach was used to engage study participants at the national and district levels while the CSA approach was applied for participants at the community level.

There are four sections in this chapter. This first section is the introduction and is followed by a section presenting the results from the IUCN SA approach. Subsequent sections present findings from the CSA approach, and a summary of findings respectively.

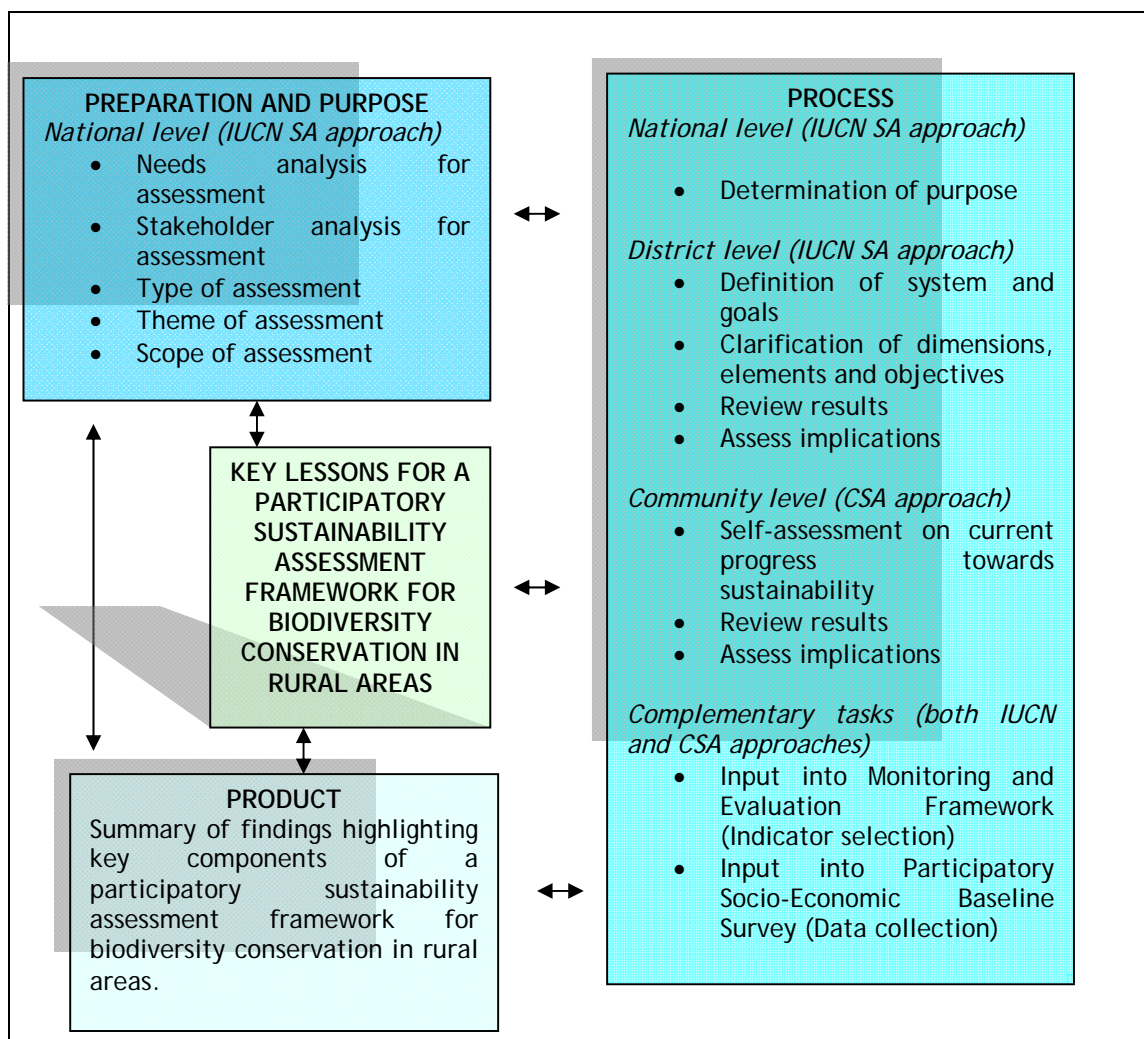
³¹ The key role of members of these multiple-stakeholder forums is to work with MDTP to plan and implement biodiversity conservation strategies. They are referred to as “MDTP partners” in this thesis.

³² Detailed description of study participants is found in Chapter 3, section 1.4.

2 FINDINGS FROM THE INTERNATIONAL UNION FOR CONSERVATION OF NATURE SUSTAINABILITY ASSESSMENT APPROACH

The presentation of findings covers three main areas as depicted in Figure 6.1. Findings focus on issues of i) preparation and determination of the purpose for undertaking SA which entailed needs analysis and stakeholder analysis as well as the determination of the type, theme and scope of SA; ii) the preferred process for conducting SA at multiple governance levels for national, district and local community levels; and iii) the key products from the undertaking of the SA process within the MDTP. These three aspects contribute to key lessons learned for applying SA in the MDTP area, which are presented in the discussion in Chapter 7. Another key product from the findings is the key components of a PSAF for biodiversity conservation in rural areas. These are also aligned with the research questions and objectives articulated in Chapter One.

Figure 6.1: A schematic depiction of the main sections on findings from the sustainability assessment of biodiversity conservation in the rural areas for the MDTP in Lesotho



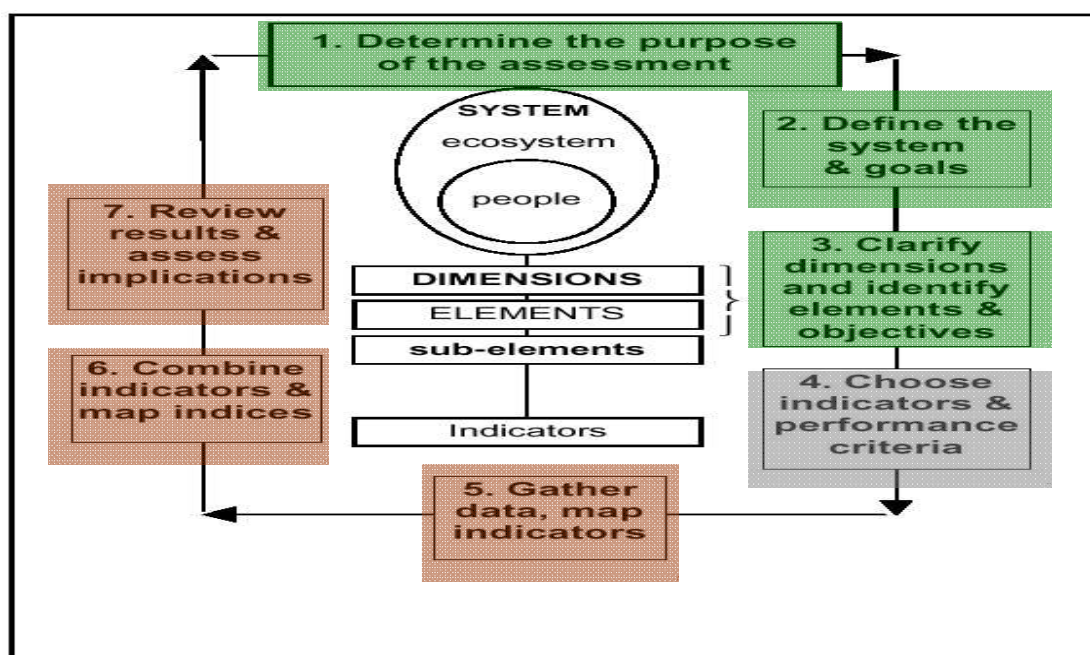
Source: Author's construction.

2.1 Preparation for undertaking sustainability assessment

Preparations for applying the IUCN SA for the MDTP involved discussions with MDTP staff members at the national level. These preparations entailed presentations on the features, advantages and limitations of the IUCN

approach. The IUCN approach has seven stages as illustrated in Figure 6.2. It is flexible and allows modifications for users to meet their specific needs.

Figure 6.2: The seven stage sustainability assessment cycle³³



Source: Guijt & Moiseev, 2001a - Modified by author.

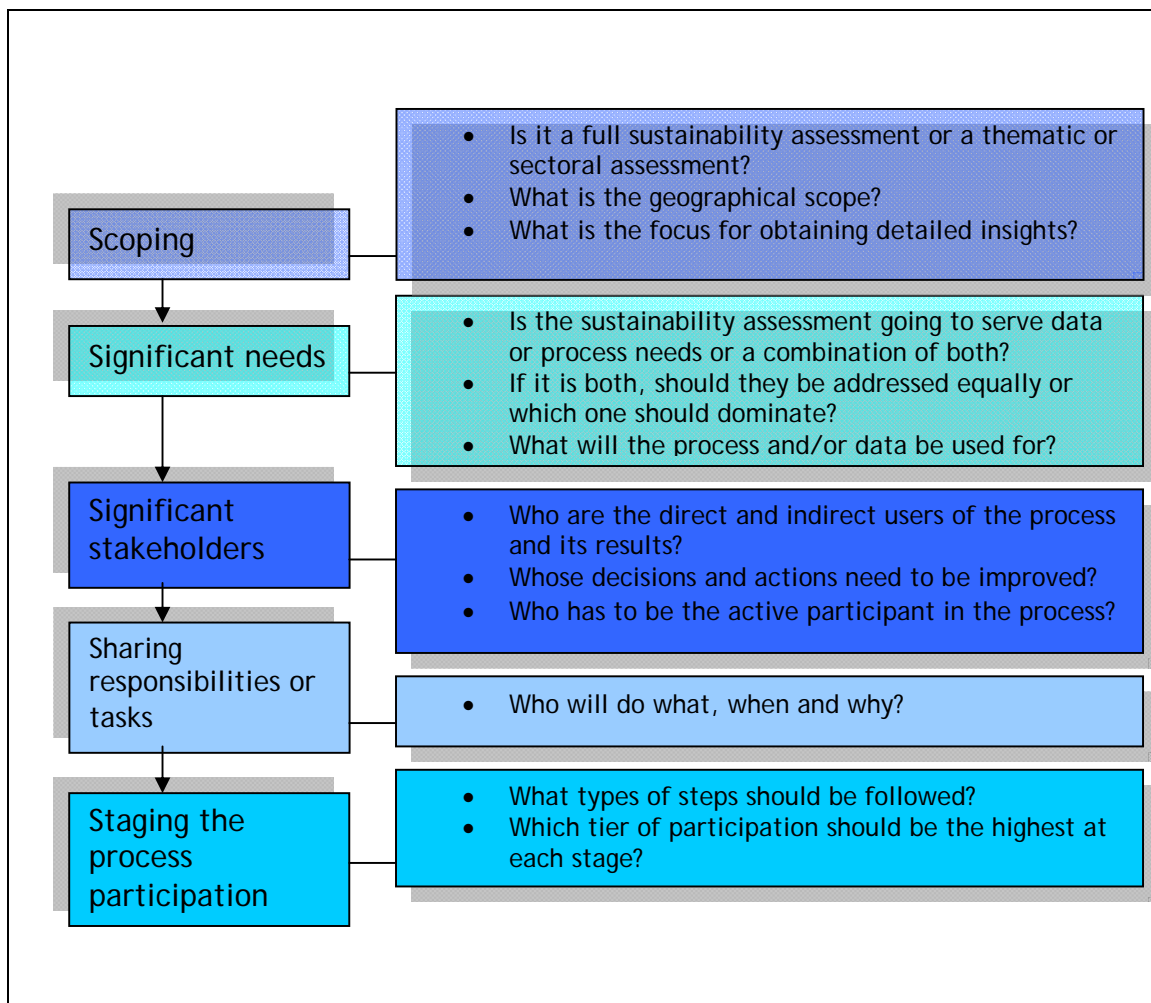
The first four stages of the IUCN SA approach are relevant for formulating a broad vision of sustainability, using a reflective process. The last three are applied to handle data and measure the condition and trends of sustainability (Guijt & Moiseev, 2001a). The next subsection gives reasons for using only four stages of the IUCN approach. It begins with the results of undertaking the first stage of the IUCN approach in the MDTP area, a stage which deals with determining the purpose of sustainability assessment.

³³ Color code: Green: achieved in this study; grey – partially accomplished; brown – not conducted

2.2 Stage 1: Determining purpose for sustainability assessment

Five issues depicted in Figure 6.3 were discussed to establish the purpose for undertaking a SA by the MDTP. These issues covered scope, significant needs, stakeholders, sharing of tasks and responsibilities, and staging of the preferred process.

Figure 6.3: Main aspects considered when determining the purpose of assessment



Source: Author's construction.

2.2.1 Scope of sustainability assessment

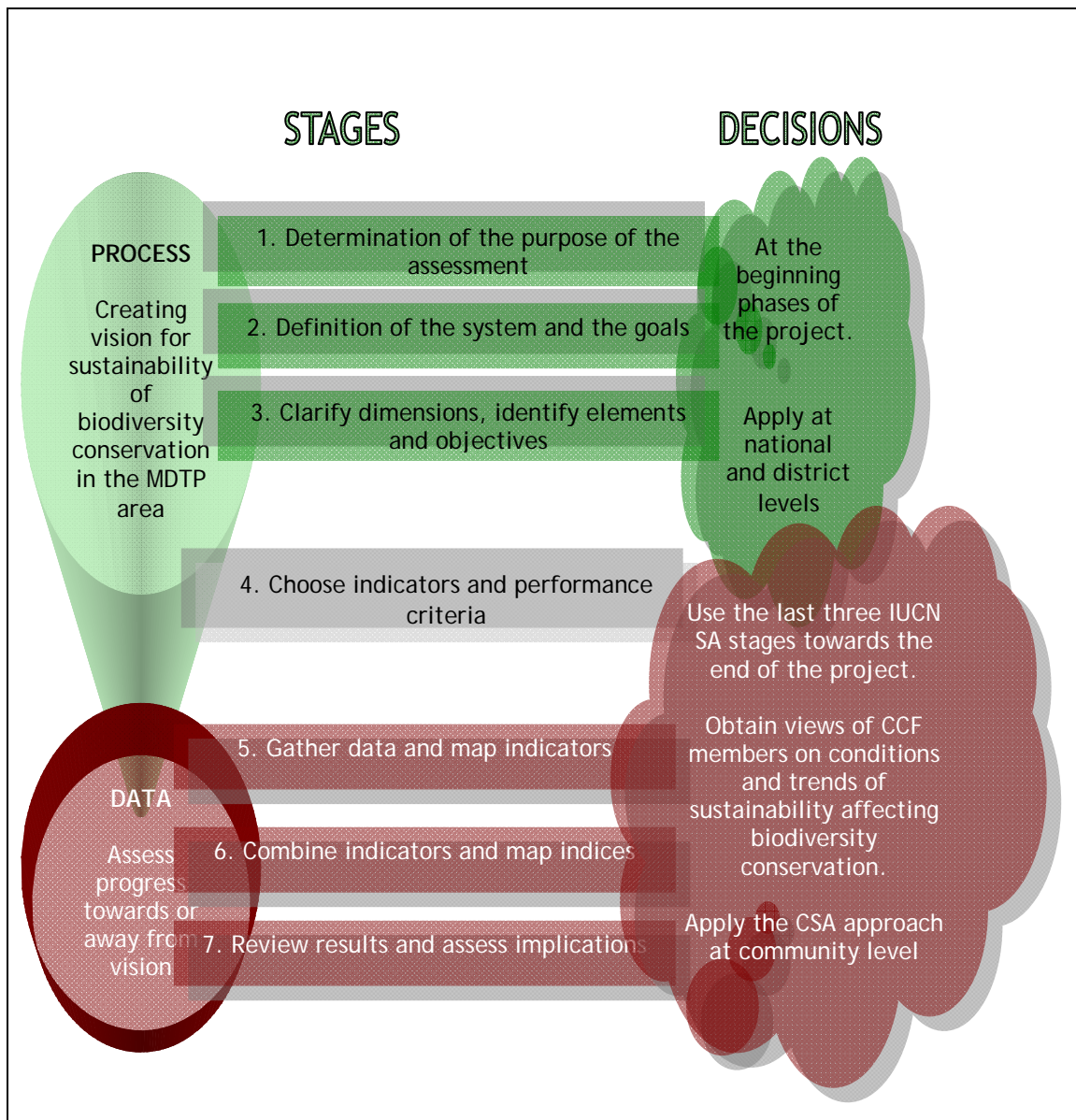
The scope of the SA was determined by the availability of resources, especially time and budget constraints, as well as priority tasks within the MDTP at the

time of the study. The geographic scope for the application of the SA was on the Lesotho side of the MDTP. The specific areas selected were three districts where the MDTP had planned to implement its initial biodiversity conservation interventions in partnership with its implementing partners at district and community levels. In line with this scope, the SA process required a participatory approach to inform decision-making of the MDTP partners at district and community levels towards the planning of the initial biodiversity conservation interventions. This is because district and local partners were regarded as being in a better position to sustain biodiversity conservation initiatives in the MDTP area since they lived in the MDTP area and made decisions related to biodiversity on a daily basis. In the context of the SA application, informed decisions, which MDTP partners needed to make collectively, related to:

- Components of a comprehensive and shared vision for sustainability of biodiversity conservation in rural areas within the MDTP area;
- What needs to be specifically assessed to monitor and evaluate changes towards or away from the vision;
- Issues affecting biodiversity conservation on which awareness needs to be raised at the community level.

The above decision-making points guided the purpose and specific tasks as well as the scope for applying the SA. Hence, the scope was a partial SA using relevant stages of the IUCN approach, focusing on the sector of biodiversity conservation and promoting the theme of participation. Consequently, the SA was not a full SA but concentrated on the first four stages of the IUCN approach, which deal with visioning aspects only. The last three stages dealing with data handling and measurements would follow later if funds were available (see Figure 6.4). To qualitatively assess the conditions of sustainability in the MDTP at the community level, the data handling stages of the IUCN SA approach were substituted by qualitative self-assessments using the CSA approach.

Figure 6.4: Description of the seven stages of the IUCN approach and the decisions made on how to carry SA to meet the purposes set by the MDTP



Source: Author's construction.

Table 6.1 presents results from discussions based on the first four stages of the IUCN SA approach. The table outlines tasks, areas of emphasis and processes to be complemented by undertaking a sustainability assessment.

Table 6.1: The first four stages of the IUCN SA approach, their requirements and process outputs and process to be complemented

Stage	Components	Sustainability Assessment Tasks	Key areas of emphasis for process outputs	Parallel or ongoing processes and activities to be complemented by sustainability assessment process
1	Purpose	Establish scope, stakeholders and process with MDTP specialists (the drivers of the SA process).	<ul style="list-style-type: none"> • Expectations in terms of scope and main purpose. • Determination of responsibilities and roles of various stakeholders. • Reflection and deeper understanding of the term sustainability in the context of biodiversity conservation. 	<ul style="list-style-type: none"> • Collection of qualitative socio-economic baseline data. • Action planning for biodiversity conservation by district steering committees.
2	System and goals	Determine the system of people and ecosystem of the MDTP area through the stakeholder eyes. Clarify goals for human and ecosystem well-being to provide an overriding picture of what to assess.	<ul style="list-style-type: none"> • Determination of vision of well-being. • Stakeholder views on what constitutes human and ecosystem well-being for the sustainability of biodiversity in the MDTP area. • Agreement of human and ecosystem goals to be pursued by stakeholders towards realizing biodiversity conservation. 	<ul style="list-style-type: none"> • Collection of qualitative socio-economic baseline data. • Action planning by district steering committees. • Awareness raising and environmental education or learning on the condition and trends of biodiversity in the MDTP area.
3	Dimensions, elements and objectives	Identify main issues or characteristics of human and/or ecosystem well-being to be assessed in a systematic manner to	<ul style="list-style-type: none"> • Reflections on the priorities for the sustainability of biodiversity conservation. • Agreement on locally relevant issues and concerns. 	<ul style="list-style-type: none"> • Collection of qualitative socio-economic baseline data. • Action planning for biodiversity conservation by district steering committees.

		determine the condition of the system.		
4	Indicators and performance criteria	Distinguish measurable and representative features of main issues and the standards of achievement.	<ul style="list-style-type: none"> • Indication of possible indicators 	<ul style="list-style-type: none"> • Development of a participatory monitoring and evaluation framework. • Collection of qualitative socio-economic baseline data. • Action planning for biodiversity conservation by district steering committees.

Source: Author's construction.

The views of participants regarding participation in conservation initiatives were similar as they all indicated that conservation initiatives in Lesotho are usually not sustainable due to a lack of effective participation and community empowerment in decision-making processes. The respondents also expressed the need for a participatory SA process to ensure that biodiversity conservation initiatives undertaken by the MDTP are sustained in the long-term. They also highlighted that a SA is required to strengthen and build on ongoing work and partnerships within the MDTP. It was pointed out that the MDTP has established partnerships at district and community levels and has undertaken several activities with their partners. Hence another perceived role of a SA process was to contribute towards ensuring that achievements and partnerships are sustained beyond the lifetime of the MDTP. Also, a SA process would assist MDTP partners especially at the community level to collectively reflect on:

- issues that threaten the achievement of the vision for sustainability so that partners can raise awareness on these issues and sensitize community members; and
- elements of sustainability on which action plans should be devised to move towards the vision.

The specifics regarding the need felt by the participants to adopt a predominantly participatory process are presented in the following section.

2.2.2 Needs for sustainability assessment

Participants expressed that the SA process should also highlight the perceptions of partners regarding the priorities, as well as desirable conditions for human and ecosystem well-being, which can support biodiversity conservation strategies. To further clarify the main needs for undertaking a SA, various process and data needs that can be met using the IUCN SA approach were presented to participants to discuss and prioritize (see Table 6.2). Study participants prioritized process needs over data needs.

Table 6.2: Prioritization of needs for undertaking a sustainability assessment within the Maloti Drakensberg Transfrontier Project area

Need	Priority ³⁴	MDTP expectations from process	Direct users and Active participants
PROCESS			
Stimulate critical debate on a broad vision for sustainable development of biodiversity and how to assess it	Very High	An agreed vision for sustaining biodiversity in the MDTP area and aspects to measure changes to or from the vision.	District
Clarify and provide solid rationale for project action priorities	High	Allow reflection and learning on MDTP priorities, strategies and objectives.	District and community
Raise awareness on how ecosystem well-being and human well-being are interconnected	High	Input into awareness-raising on interdependencies between biodiversity and human well-being for current and future generations.	District and community
Gain organizational consensus about focus of interventions	High	Facilitate discussions on biodiversity related interventions planned by the MDTP.	District and community

³⁴The process for priority ranking was described thoroughly in Chapter 3.

Enhance local ownership of the project and interventions	High	Promote discussions where stakeholders agree on tasks and responsibilities for continuity of biodiversity conservation initiatives beyond the life of phase one of the MDTP.	District and community
DATA			
Measure baseline situation and collect data for outcome or impact analysis	Medium	Provide relevant qualitative socio-economic information to complement quantitative data.	National
Improve reporting to international conventions	None	No expectations at this stage of the project because this issue was to be addressed through other consultancy assignments.	National
Identify critical action gaps	None	No expectations because this issue was to be addressed through other consultancy assignments later on.	National
Identify critical data gaps	None	Addressed through other assignments later on.	National
Identify geographic areas within the MDTP that lag in terms of sustainable development and therefore need more targeted efforts	None	No expectations because areas for the assessment were already selected.	National
Help lay the basis for a comprehensive monitoring system	Medium	Complement development of a participatory monitoring and evaluation framework.	National and district

Source: Author's construction.

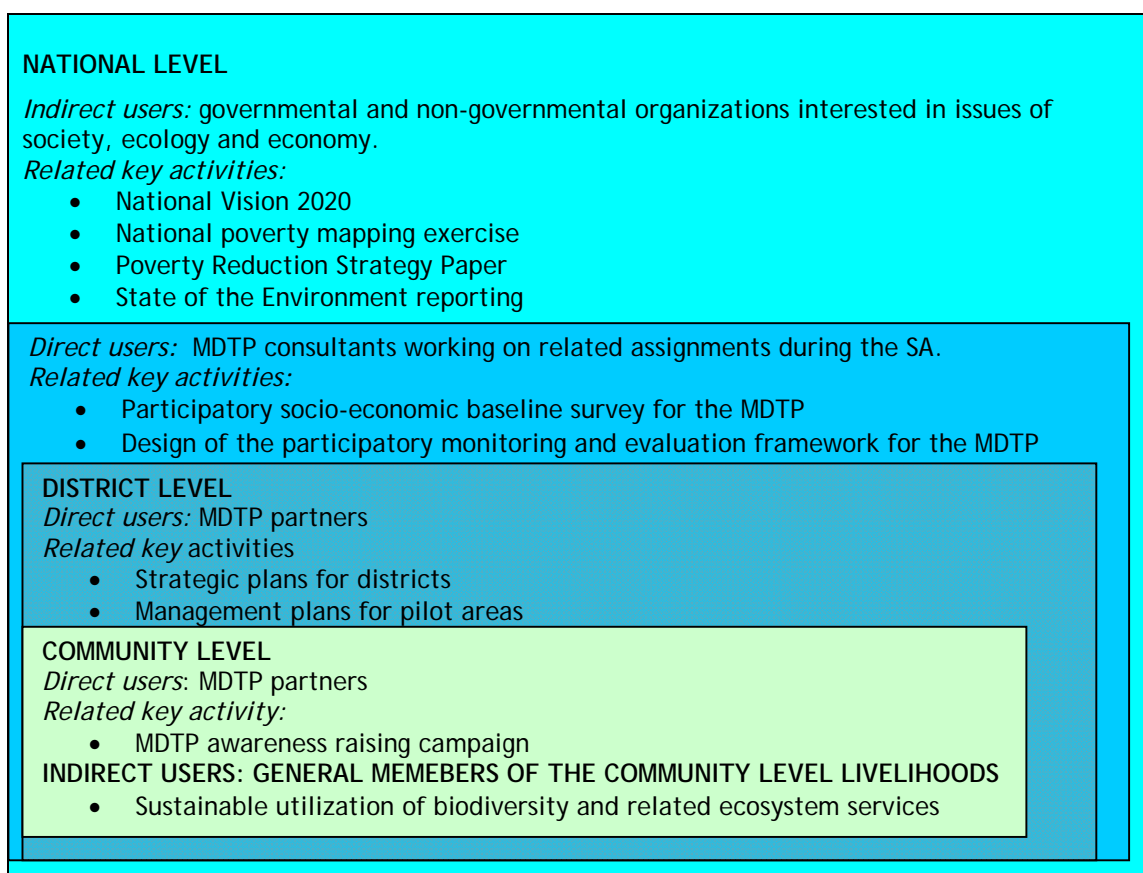
2.2.3 Users of sustainability assessment process

During the discussions, study participants at the national level identified direct and indirect users³⁵ of the SA process. These users and the type of uses they could benefit from the SA are presented in Figure 6.5. Direct users consisted of MDTP partners and consultants, while indirect users comprised governmental and non-governmental organizations interested in information on ecology,

³⁵ "Direct users" refers to those the SA process would help to improve their decision-making about issues, actions and changes for the sustainability of biodiversity conservation in the MDTP area. These were the MDTP staff members and MDTP partners at the district and community level. Indirect users whose initiatives, activities and mandates could benefit from the SA process were MDTP partners at the national level as well as members of the community in the MDTP area.

society and economy. It was important to establish the uses and related key activities so that participants would know what they would benefit from the SA process.

Figure 6.5: Users and ongoing processes that were complemented by the SA process



Source: Author's Construction.

On the issue of how the SA process should complement other ongoing processes and activities, participants concurred that the SA should not be a stand-alone process. They identified several processes and activities to be complemented by the SA. These processes were highlighted earlier in Table 6.1. They are now

portrayed according to the level of decision-making in Figure 6.5. The ability of the SA to complement ongoing processes and activities was regarded as vital for saving resources in terms of time and money for MDTP partners at district levels, as they had to travel long distances to attend meetings and workshops. Intertwining the SA process with other activities made it easier for the various partners to contribute to and participate in the process.

2.2.4 Tasks and responsibilities of users or participants

Having identified the direct and indirect users who were to be involved in the SA process, their roles and responsibilities were identified and discussed as per Table 6.3. The interests in and capacities for the sustainability of biodiversity conservation differed between stakeholders at different governance levels, hence their tasks and responsibilities within the SA process varied. The only aspect common to all participants was that none of them had prior experience in the use of SA. The exception was one MDTP staff member who had previously been exposed to the IUCN SA process.

These activities to determine the purpose of the SA led to the identification of preferences regarding how participation should be incorporated into the SA process, as discussed in the subsequent section.

Table 6.3: Stakeholders, their interests and capacities, levels of experience and main tasks for sustainability assessment

Level	Stakeholders	Interests and Capacities	Levels of experience with SA	Main tasks for sustainability assessment
National	Members of the National Steering committee belonging especially to the sectors concerned with environment, economy, tourism, and agriculture	Information related to their respective mandates. Some regulate and others implement activities that affect biodiversity and have decision-making power regarding activities affecting biodiversity.	None	Agree and advise on priority national interests and see that these are being met beyond the life-time of the MDTP.
District	Members of the District Steering Committees	Multi-sectoral forum implementing biodiversity conservation issues at district level. Manage various activities affecting biodiversity more closely than the national level and will continue living and working in the MDTP area beyond the life-time of the MDTP.	None	Identify vision, goals, objectives, dimensions and elements
Community	Community conservation forums <i>Range Management Areas members</i> General members of the community	Multi-stakeholder forum for working with protected areas. Live within the communities who are using the biodiversity and can help spot and address issues earlier than other stakeholders.	None	Assess and reflect on conditions of sustainability Identify issues for awareness raising and priority action.
MDTP	Project staff	Plan adequately to ensure participation in sustaining biodiversity conservation initiatives beyond the project provision of resources to facilitate reflective sustainability assessment	Few had a slight idea about.	Drivers of the sustainability assessment process.

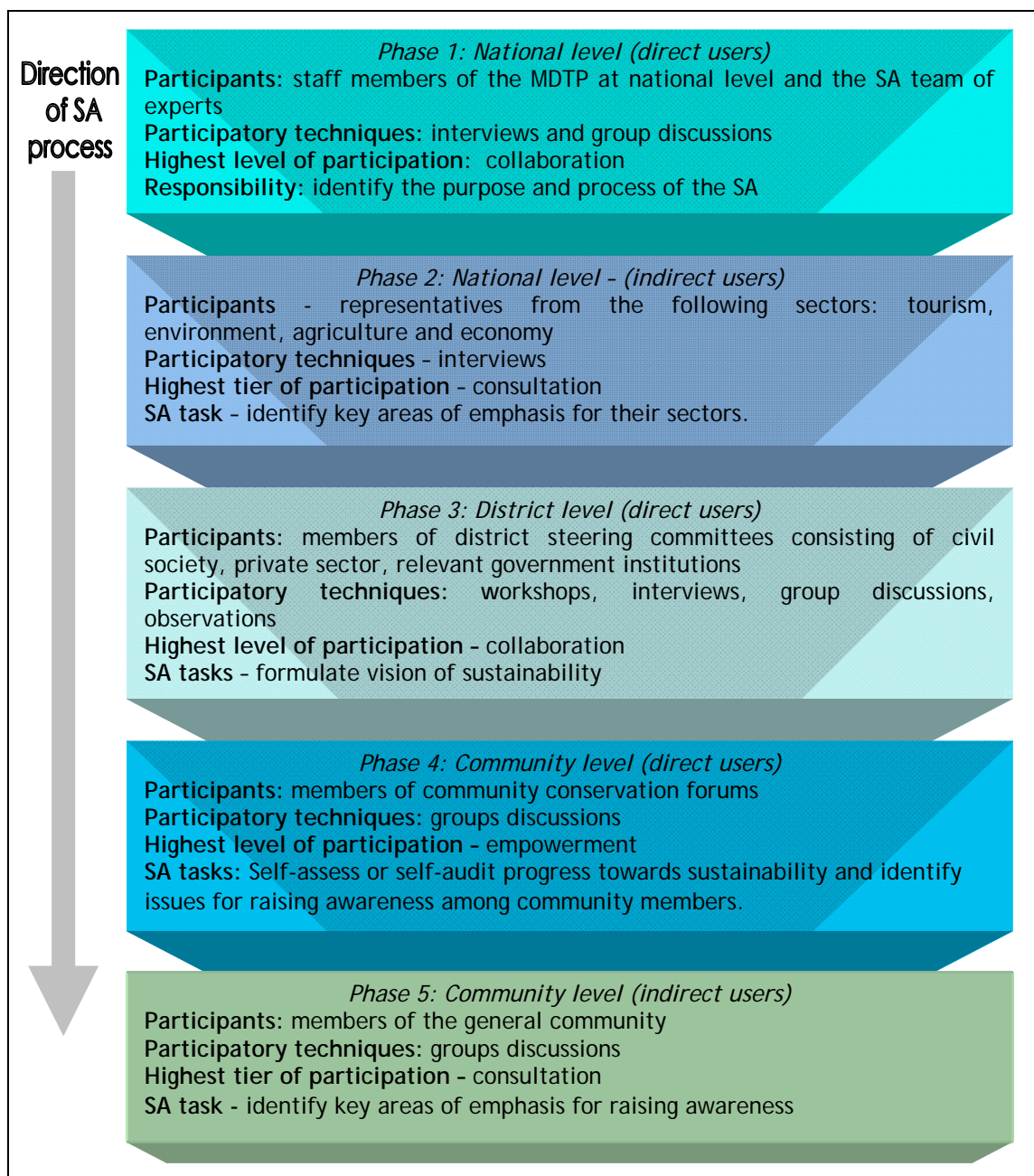
Source: Author's construction.

2.2.5 Staging the participatory process

The various degrees of participation and their associated characteristics were discussed with the study participants. Participants indicated that they emphasized collaboration and empowerment when dealing with their partners at both district and community levels. Hence, direct users of the SA process and results, had to actively participate at the collaborative and empowerment levels, while indirect users would be informed and consulted to get their views on some issues.

At the district level participants preferred that the SA process be conducted through workshops, where external experts facilitate the collaboration of partners towards the formulation of a shared vision, using the IUCN SA approach. Because of time constraints, partners would not be trained to use the tool themselves. This is because capacity building to ensure competence in the use of the IUCN approach requires ample time. Conversely, at the community level, the type of tool used for the SA process was a checklist that community members themselves could use with minimal dependence on external experts. The role of external experts was to translate the contents of the tool for participants into the vernacular language. Consequently, the degree of participation and techniques varied between different users of the process. Figure 6.6 portrays aspects of participation in terms of phases, participants, techniques, tiers and responsibilities. It also indicates that the degree of participation was higher for direct users than for indirect users.

Figure 6.6: Issues of the SA process in terms of users, participants, techniques, tiers and tasks



Source: Author's Construction.

The importance of higher levels of participation for partners (members of the DSCs and CCFs) was to enhance the ownership of the planned MDTP intervention among partners. Having determined the purpose of the SA and identified the key issues to be addressed by consulting with MDTP staff at national level, the second stage of the IUCN approach was conducted by involving MDTP partners at the national and district levels. The results of these activities are the subject of the following section.

2.3 Stage 2: Defining system and goals

At the national level the MDTP had delineated the assessment system³⁶ to cover three development nodes where they had planned for early biodiversity conservation interventions. Now the system needed to be defined on the basis of the preferences and values of partners. Two categories of stakeholders were involved in defining the system and goals for sustaining biodiversity conservation in the area. The first category of stakeholders consisted of representatives from the National Steering Committee (NSC) dealing with environment, agriculture, economy and tourism issues. They were interviewed on issues regarding what they would like to see sustained and the reasons for their responses. The responses from these interviews revealed the key objectives of each sector concerning biodiversity conservation in the MDTP area. The second category comprised of members of the DSCs who participated in workshops to collectively create a shared vision of sustainability.

³⁶ The definition for “system” used in this study comes from Guijt & Moiseev, 2001b: p45: “*The system is the spatial area comprising of people (human communities, economies and related aspects) within an ecosystem (ecological communities, processes and resources), together with their interactions*”.

2.3.1 A context-specific definition for sustainability

The formulation of a context-specific definition of sustainability is a key requirement in designing an effective SAF (Pope *et al.*, 2004; Gibson *et al.*, 2005). The responses of participants at the national level expressed issues relevant to the mandates of various stakeholder sectors. For instance, the tourism sector emphasized the need for the sustainability of biodiversity conservation initiatives so that the viability of the tourism industry could be sustained in the long-term. The agriculture sector focused on the importance of proper cultivation methods and range management for enhanced agricultural production (both crops and livestock) to support livelihoods in the long-term. The economic sector singled out the importance of economic development through employment creation and its contribution to poverty reduction. The environmental sector emphasized the importance of maintaining biodiversity, not only for livelihoods, but to meet international targets for biodiversity conservation. Interestingly, some of the participants were not aware of how their mandates related to the mandates of other participants. This indicates the prevalence of a fragmented and silo mentality towards sustainability. It was expected that these national stakeholders would at least have some idea about the interrelations between human and ecosystem well-being, so that they could consider these issues during their decision-making. Perhaps, it is because this study was conducted during the early years of the MDTP project.

Interestingly, at the district level, workshop participants had a more holistic perception of sustainability issues. They were conversant with the symbiotic relationship between human and ecosystem well-being. This reveals that the MDTP had concentrated most of its environmental education at the lower levels of decision-making rather than at the national level. Hence their definition of sustainability for biodiversity conservation covered issues from both human and ecosystem subsystems simultaneously. Their perceptions of the sustainability of the ecosystem and human well-being were not as fragmented as those observed in interactions with MDTP partners at national level.

Except for a few issues peculiar to each area, results from the members of the DSCs from the three development nodes were remarkably similar and are presented in Table 6.4. Human well-being issues that were raised in discussing and determining the vision, were related to issues such as the allocation of sites for biodiversity conservation and tourism, employment creation, awareness about sustainability threats of biodiversity, and the creation of institutions to deal with biodiversity and tourism development in the area. Those related to ecosystem well-being, were related to the management of grazing, soil and land conservation, sustainable resource use, species conservation, creation of protected areas, and the protection of wetlands and cultural landscapes.

Table 6.4: Summary of issues to be addressed to realize the vision of sustainability for biodiversity conservation in the MDTP area

Issues related to human systems	Issues related to ecosystems
<ul style="list-style-type: none"> • Selection and designation of sites for conservation and nature-based tourism • Institutions to manage natural resources and promote nature-based tourism • Awareness at the community level • Empowerment and capacity building • Serious cross-border theft and conflict • Valuing and protection of tourists • Communities to obtain tourism related benefits to curb poverty and decrease unemployment. • Proper, environmentally friendly and legal allocation of residential sites and fields. 	<ul style="list-style-type: none"> • Rangelands deterioration curbed • Overgrazing controlled • Unsystematic burning of rangelands controlled • Soil erosion managed • Increased aesthetic appeal • Over-harvesting herbs and medicinal plants managed • Controlled hunting of wildlife • Damage to sites of cultural, historical and biodiversity significance curbed • Trampling of wetlands by livestock controlled.

Source: Author's construction

The issues raised in the three districts aligned with the components of the MDTP project. Neither did these issues conflict with international, continental, regional and national policy and regulatory requirements. This indicates that the MDTP partners achieved consensus on what they would be addressing with respect to biodiversity conservation efforts in the MDTP area. It also indicated that MDTP staff had adequately raised awareness about key sustainability issues and threats to biodiversity conservation, as well as the related policy and legal requirements relevant to the MDTP.

2.3.2 The vision and goals of sustainability

Following the requirements of stage two of the IUCN approach, members of the DSCs worked together in groups to create a vision and determine the goals of sustainability for their respective areas. The visioning exercise entailed three main reflective activities that focused on:

- Retrospection on how ecosystems and human systems were before members of the DSCs partnered with the MDTP;
- Achievements to date through their partnership with MDTP; and
- Desirable futures for human and ecosystem well-being in the next 10 to 20 years.

While participants came from diverse backgrounds, they agreed on aspects of a vision as they had a common understanding of the requirements for biodiversity conservation in their areas. Goal statements, which encapsulate the overall, ecosystem and human society, are in Box 6.1.

Box 6.1: The vision and goals for the sustainability of biodiversity conservation in the MDTP area

<p>Vision of sustainability in the MDTP area: Twenty years from now we envision communities that work together, respecting and caring for our natural resources so that they can support our livelihoods in the long-term. We preserve and guard our historical, cultural and biological heritage.</p>

<p>Goal for the overall well-being of the system: We aspire to and will work towards united and vibrant communities living within productive ecosystems that support, enhance and maintain biodiversity and human livelihoods.</p>

<p>Goal for human well-being: We desire and will enhance vibrant and aware communities with socially and economically secure livelihoods.</p>
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<p>Goal for ecosystem well-being: We value and will protect and enhance the resilience of our ecosystems by protecting biodiversity and natural resources and using them in a sustainable manner for the continued supply of ecosystem services in the short and long-term.</p>
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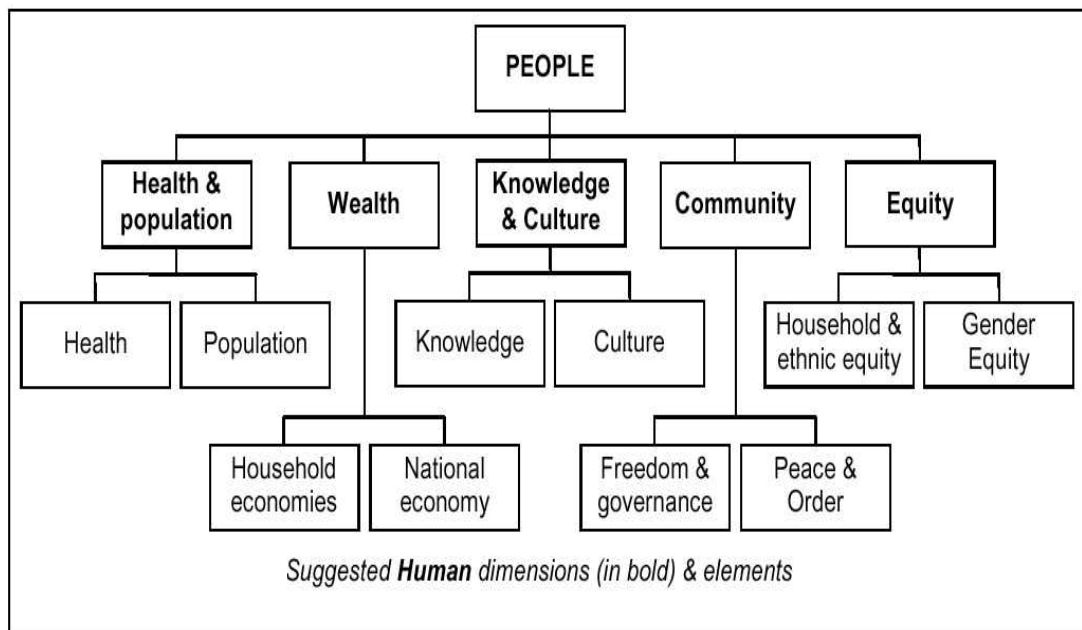
Source: Author's construction.

The further specification and clarification of components of the vision, sustainability dimensions, elements and indicators followed in stage 3 of the IUCN SA approach, as presented in the following section.

2.4 Stage 3: Clarifying dimensions, identifying elements and indicators

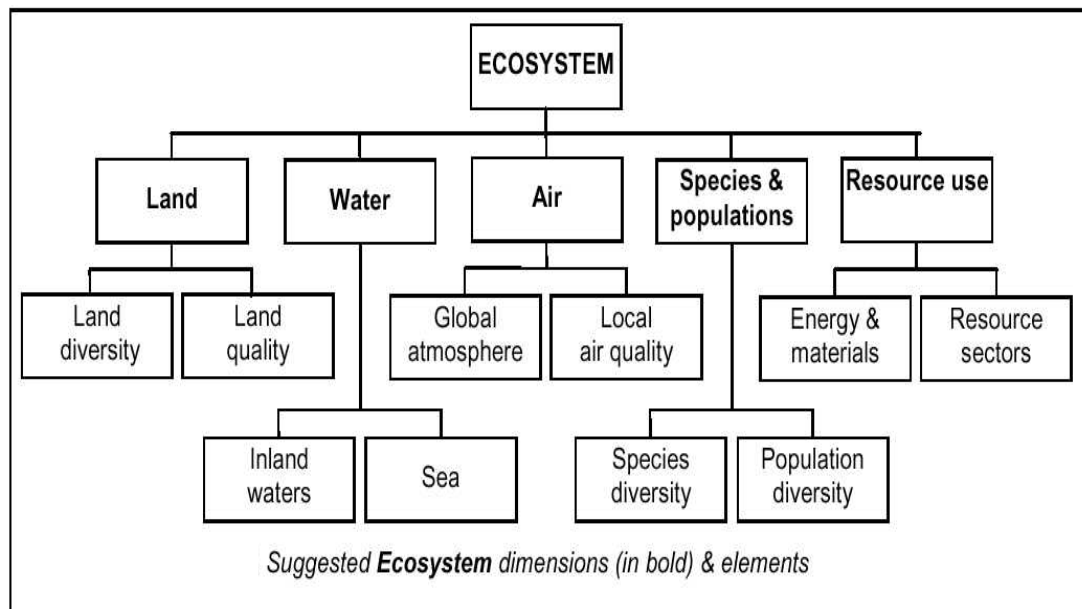
Prior to the workshop, a tentative list of dimensions, elements and indicators was compiled, based on the IUCN SA approach as described in Chapter 3. These were presented for discussion, selection or cancellation depending on perceptions of their relevance, necessary modifications, suggestions on their applicability and prioritization. Figure 6.7 and Figure 6.8 depict these human and ecosystem dimensions, as suggested by the IUCN SA approach.

Figure 6.7: A depiction of human dimensions and elements presented at workshops for discussion, selection for relevance and prioritization



Source: Guijt & Moiseev, 2001a.

Figure 6.8: A depiction of ecosystem dimensions and elements presented at workshops for discussion, selection for relevance and prioritization



Source: Guijt & Moiseev, 2001a.

Figures 6.7 and 6.8 were presented to stakeholders to discuss the dimensions in order to answer four questions:

- Is this dimension applicable to the sustainability of biodiversity conservation in your area?
- Do you need to make decisions on this dimension? Or do you need information on this dimension to make decisions related to biodiversity conservation?
- Should assessments of progress towards sustainability address this dimension? Or should the assessment of proposed plans, programs, projects and other initiatives, address this dimension?
- What degree of priority do you give this dimension compared to others? None? Low? Medium? Or High?

The results of this stage are presented in two subsections, one dealing with ecosystem aspects and the other focusing on human society.

2.4.1 Clarifying dimensions for the ecosystem subsystem

Table 6.5 depicts how participants prioritized ecosystem dimensions after the workshops. Comments regarding why dimensions were prioritized in the table, are highlighted.

Table 6.5: Proposed versus revised set of ecosystem dimensions after stakeholder inputs

Dimensions for discussion	Revisions and prioritization	Comments
Land	1. Land and soil	Essential for provisioning services supplied by land ecosystems in the form of food, fodder, rangeland, settlement.
Resource use	2. Resource use	Essential for provisioning services such as water, rangeland, food, medicines, fuel wood, thatch grass.
Species and populations	3. Habitats, Species and populations	Essential for provisioning services. Importance of the intrinsic value of biodiversity mentioned at the national level but not by the DSCs members.
Water	4. Wetlands	Significance related to regional economy for producing water. Conversely, some local community members view wetlands as a nuisance that bogs down their livestock and should be converted to arable fields.
Air quality	Not prioritized	Not seen as a significant ³⁷ /relevant sustainability issue, perhaps in the future with tourism in place it might be an issue. Hence it was left out among sustainability dimensions.

Source: Author's construction.

The four themes identified in order of priority under the ecosystem subsystem are land and soil; resource use; habitats and species; and wetlands. The air quality dimension was not regarded as a key issue by participants for the

³⁷ Rules for establishing significance are in Gibson *et al.*, 2005.

sustainability of biodiversity conservation, therefore it was excluded from the prioritized ecosystem dimensions. As a result, the ecosystems subsystem had four dimensions instead of five. Stakeholders indicated that if the air quality dimension becomes an issue in the future they would include it when they revise the SA framework. Participants identified the land and soil dimension as the overriding sustainability aspect on which other ecosystem dimensions depend, either directly or indirectly. Natural resources used by communities, habitats and species, as well as wetlands, depend directly or indirectly on land and / or soil. Participants identified land degradation to be a key threat that needs to be managed towards sustainability, the reason being that it is perceived to decrease the supply of services related to food, fodder, fuel, thatch grass, and medicines. These services fall within the category of provisioning ecosystem services, according to the terminology used by MA (2005). They further indicated that degraded land needed to be rehabilitated for the continued supply of the provisioning ecosystem services. Participants also noted that land degradation leads to an increase in landlessness, which results in human settlement encroaching onto already limited arable land. They also mentioned that limited arable land causes some community members to cultivate marginal lands, such as steep mountain slopes. This threatens the integrity of these fragile areas.

Use of resources such as rangelands, wetlands, medicinal plants, shrubs, thatch grass, firewood and other natural energy sources was ranked second in importance by participants. They mentioned that it is important to know how these resources are being used, and the trends attached to these resources in terms of deterioration, improvement, as well as threats. Habitats and species were ranked third and were also important in the context of provisioning services, and not for the intrinsic value of biodiversity. The condition of wetlands and the need for their protection was mentioned as the last dimension. This is because the importance of wetlands in providing the ecosystem service of water was not perceived as a threat to the sustainability

of livelihoods in the immediate area because there is abundant water. However, it was perceived as a threat for the continued provision of water for other downstream communities and it was then included among the priorities. Also, wetlands were not perceived as being directly linked to provisioning services, consequently they were placed last among the priorities.

Reasons for the selection and prioritization of dimensions were mostly related to provisioning ecosystem services, especially food production. This is to be expected as poverty is a key issue in the MDTP area and each dimension was regarded as being a priority because of its perceived role towards the alleviation of poverty.

From the dimensions selected, elements and indicators were selected. Table 6.6 portrays elements³⁸ and indicators selected for assessing progress away from or towards realizing sustainability in the four ecosystem dimensions. The key concerns of ecosystems that participants agreed should be considered to realize the sustainability goals, included land degradation and rehabilitation, arable land encroachment, access to quality of land, protection of indigenous species, designation of protected areas for biodiversity conservation, eradication of ecologically significant invasive species, enhancement and protection of wetland, improvements to rangelands, sustainable use and harvesting of medicinal plants, shrubs, firewood and other natural energy sources.

³⁸ Elements refer to features or key concerns of human society or ecosystems that partners agree should be considered to obtain a clear picture when assessing progress towards sustainability goals (Guijt & Moiseev, 2001).

Table 6.6: Elements and indicators for assessing sustainability of the ecosystem subsystem in the MDTP area

DIMENSIONS	ELEMENTS	INDICATORS
LAND	<i>Land rehabilitation</i>	Area under improved conservation practices as % of total area
	<i>Land degradation</i>	Degraded land (area affected by erosion) as % of total land/total length of gullies in the area
	<i>Arable land encroachment</i>	% of arable land encroached by settlements as % total of arable land
	<i>Access to quality of land</i>	% of inhabitants defining their land as being of good quality
RESOURCE USE	<i>Rangelands</i>	% rangeland under rehabilitation as % of total rangeland area
	<i>Medicinal plants</i>	% area of land set aside for propagation of medicinal plants as proportion of total land under sustainable use. % medicinal plants harvested as % of annual yield.
	<i>Shrubs, firewood and other natural energy sources</i>	Consumption of firewood etc as % average annual yield.
SPECIES AND POPULATIONS	<i>Indigenous species</i>	Decrease in indigenous species as % of species 30 years ago
	<i>Biodiversity</i>	Numbers of areas designated as protected areas Protected area as % of total area
	<i>Ecologically significant invasive species</i>	% area under active management as % of total area occupied by selected invasive species
WETLANDS	<i>Wetland condition and protection</i>	% area of regionally significant wetlands under protection from human threats as % total of total wetland area.

Source: Author's construction.

2.4.2 Human systems

Table 6.7 depicts human and ecosystem dimensions, which were compiled and presented to stakeholders to discuss and prioritize. Comments regarding why dimensions were prioritized in the table are highlighted.

Table 6.7: Proposed versus revised set of human dimensions after stakeholder inputs

Dimensions for discussion	Revisions and prioritization	Comments
Wealth	1. Community wealth and economic well-being	Poverty is a key problem in the area; hence the need for economic development was prioritized by stakeholders at all levels, with ecotourism perceived as a potential livelihood strategy for economic diversification and economic growth in rural mountain areas of the MDTP area.
Health and population	2. Health	The main issue here is HIV/AIDS, which results in many orphans and places a burden on society, especially the elderly.
Community	3. Community, Safety and Equity	Stock theft was the major issue here as it is related to provisioning services. Livestock is useful for planting, food, ceremonies and transport, hence it is the third priority.
Equity	4. Governance and Participation	Poor enforcement of range management and harvesting of medicinal plants were mentioned by national and district level stakeholders. At the community level this was not seen to be a key issue indicating the need to raise awareness on good governance and participation.
Knowledge and culture	5. Awareness and Knowledge	Need for awareness of the condition and trends of sustainability aspects in the area, especially at the community level, including herd boys.

Source: Author's construction.

Unlike the ecosystem subsystem discussed earlier, stakeholders selected five dimensions for the human systems. The dimensions were selected because they were regarded as important for supporting a viable human subsystem, which can co-exist with surrounding ecosystems without detrimental effects. They

prioritized community wealth and economic growth as the number one sustainability dimension. They mentioned the alleviation of poverty³⁹, the provision of jobs and employment, the enhancement of business investments in the area through private sector contribution, the need to improve the condition of livestock, and the production of livestock products such as milk, meat, mohair and wool. They also mentioned that by addressing these issues, community members would be able to work towards a environment conducive to the realization of sustainability aspirations concerning biodiversity conservation.

Health was regarded as second in importance due to its relationship to poverty and the need for sustaining the health of community members to undertake poverty alleviation activities. HIV/AIDS-related diseases and deaths of income earners were singled out as further aggravating the already grave conditions of poverty⁴⁰ because income earners become sick and stop working. Once they become ill, money and household resources are spent caring for them until they die. In addition, assets such as livestock and furniture are sold to sustain sick adults or to pay for funerals. After a death, people are left with debts and children are either left to fend for themselves, or are left with their grandparents.

Malnutrition was also mentioned as a key problem due to a lack of proper nutrition. Furthermore, stress related diseases were indicated as prevalent in the communities. Participants indicated that stress is caused by the loss of family members through death, and also by stock theft, which can drastically alter the socio-economic status of community members in a single event. Community, safety and equity were ranked in third place, with the main issues

³⁹According to UNDP (2006; 2007), the proportion of households living below one US\$ was 56.1% while those living below two US\$ was 36.4 In Lesotho. While this information has not been aggregated for rural and urban areas, generally rural areas are harder hit by poverty than urban areas (CARE, 2001)

⁴⁰ UNDP (2006, 2007) reports HIV/AIDS prevalence of Lesotho for people aged between 15-49 years to be 23.2.

being cross-border stock theft, attitudes and values, and gender and age equity. Key issues were related to marginalization on the grounds of gender and age in decision-making related to land resources and livestock. Issues were raised that women-headed households and child-headed households need to be included in decision-making. There should be a shift from the previously male-dominated decision-making process to one that also caters for the marginalized.

Governance and participation were placed in fourth place, with the emphasis on effective participation, organizational capacity, organizational practice, policy, environment and laws. Finally, awareness and knowledge were placed in the last position, focusing on awareness, empowerment, knowledge and skills. Based on the dimensions selected, elements and indicators were verified by stakeholders and are presented in Table 6.8.

Table 6.8: Elements and indicators for assessing sustainability of the human subsystem in the MDTP area

DIMENSIONS	ELEMENTS	INDICATORS
ECONOMY AND WEALTH	<i>Poverty reduction</i>	% population living below one United States dollar per day
		% population living below two United States dollars per day
	<i>Businesses</i>	% of nature-based tourism businesses established
	<i>Private sector contribution</i>	% of private public partnerships established in the project area
	<i>Livestock condition and production</i>	Condition and amount of wool/mohair produced from livestock per household owning livestock
	<i>Resource sufficiency</i>	% of households that consider they have an adequate supply of specified natural resources (grazing land, firewood, arable land, medicinal plants, thatch grass)
	<i>Employment</i>	% of households with at least one person formally employed

HEALTH	<i>HIV/AIDS</i>	HIV/AIDS prevalence among pregnant women aged 15 to 49
		% of people aged 15-49 years with comprehensive knowledge of HIV/AIDS
	<i>Sanitation</i>	% people without access to improved basic sanitation
	<i>Water sources</i>	% people without access to improved drinking water sources
	<i>Malnutrition</i>	Children underweight for age (% children under five years).
COMMUNITY AND EQUITY	<i>Gender and age equity</i>	Sub-element: Age equity Indicator: Youth involved in decision-making related to MDTP initiatives as % of total decision-makers within the project areas
		Sub-element: Gender equity Indicator: Women involved in decision-making related to MDTP initiatives as % of total decision-makers within the project areas
	<i>Stock theft</i>	% decrease of stock theft
	<i>Increased sense of belonging</i>	% of people participating in local community initiatives and number of volunteers in the community
	<i>Range management</i>	% of households belonging to grazing associations and obeying laws on range management
	<i>Cultural norms</i>	% households complying with specific cultural norms (cultural norms: respecting sacred places, maintaining springs, respecting elders, respecting traditional leadership, attending community meetings)
GOVERNANCE AND PARTICIPATION	<i>Organizational capacity</i>	% of organizations working with MDTP with the capacity to undertake to plan, implement, monitor and evaluate project activities.
	<i>Organizational practice</i>	% of organizations working with MDTP with the capacity to develop and modify long-term goals, disseminate information to relevant people, especially local communities, and consult stakeholders during decision-making.
	<i>Policy environment and laws</i>	Laws and policies in place before Phase one of the MDTP is completed.
AWARENESS, CAPACITY BUILDING AND KNOWLEDGE	<i>Awareness</i>	% of population within the project area that is aware of the importance of biodiversity conservation and the value of nature-based tourism
	<i>Empowerment</i>	% of people involved in MDTP training initiatives and decision-making
	<i>Knowledge and skills</i>	% of people within the project area having knowledge and skills and applying these knowledge and skills

	<i>Attitudes and values</i>	% of community members respecting, appreciating and caring for cultural values and traditions
		% of community members respecting, appreciating and caring for biodiversity/natural resources
		% of community members respecting, appreciating and caring for nature-based tourism

This section applied the IUCN SA approach to the identification of the various components of a comprehensive vision for the sustainability of biodiversity conservation in the MDTP area. The dimensions, elements and indicators preferred for gauging progress towards a conducive environment for biodiversity conservation were also determined. The following section provides results from the CSA approach, which was applied at community level, by CCF members.

3 RESULTS FROM THE COMMUNITY SUSTAINABILITY ASSESSMENT APPROACH

Members of CCFs within the three districts where the workshops were conducted used the CSA as a self-assessment or self-auditing tool. The aim was to allow the CCFs to reflect on how the activities within the community support or diminish biodiversity conservation in the long-term. Just as in vision formulation, this self-assessment was based on the values, perceptions and preferences of participants. Hence the application of the CSA self-audit was subjective and included both qualitative and quantitative measurements. Through the CSA, members of the CCFs at the three development nodes discussed, debated and reached agreement on how existing community activities are affecting the achievement of the ideal vision and goals for realizing the sustainability of biodiversity conservation set at the district level. Interestingly, the members of the CCFs subscribed to the vision developed at the district level and did not make suggestions for modifications or improvements. The results of the CSA process assisted members of the CCFs to

systematically identify aspects that need to be improved to provide an environment that is conducive towards attaining the sustainability goals of biodiversity conservation. From these aspects, themes for raising awareness on both human and ecosystem well-being were identified.

The issues discussed by CCFs are presented under the following headings: socio-ecological, socio-economic and socio-cultural and spiritual. The importance of using the prefix "*socio*" is to emphasize the role that humans have towards sustainable development. Hence, progress towards sustainable development requires recognition of the centrality of human beings. This aligns with the stipulations of the ecosystem approach advocated by the CBD and other biodiversity conventions, and also with the IECD and Brundtland (1987) where the concept SD is defined.

The CSA scoring system was modified by adding two aspects, presented within two columns; one relates to bands or categories and another to issues that need awareness-raising (see Table 6.9). The results are presented beginning with the specific components of sustainability and ending with the overall picture. The findings from the three development nodes are compared.

Table 6.9: The scoring system for community sustainability assessment indicating band, overall scores, scores for components and themes, and category for awareness-raising

	Band or category	Overall CSA score	Scores for components	Scores for themes within a component	Category of awareness raising and community sensitization
Excellent progress towards sustainability	Highest	999+	333+	50+	Maintain the status quo because it is supportive of the sustainability of biodiversity conservation.
Good start towards sustainability	Middle	500-998	166-332	25-49	Improve the condition of sustainability to enhance biodiversity conservation.
Actions are needed to undertake sustainability	Lowest	0-449	0-165	0-24	Identify and begin to undertake actions towards the sustainability of an environment conducive to biodiversity conservation.

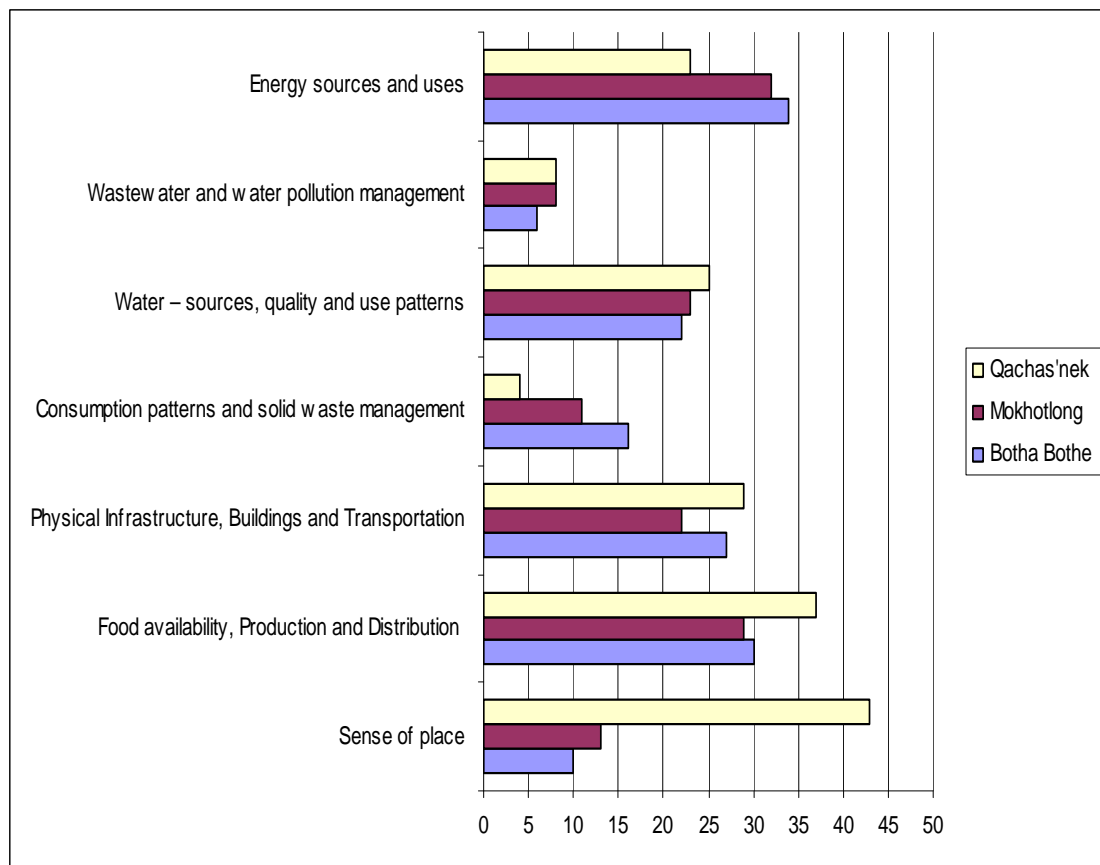
3.1 The socio-ecological component

Themes dealing with the socio-ecological component address issues related to the experiences of community members in connection with ecosystems, types of daily interactions they have with soil, water, wind, plants and animals. It covers issues of how community members use biodiversity and natural resources to meet their daily needs such as food, clothing, and shelter. Furthermore, this component addresses issues of whether the meeting of daily needs disrupts or improves ecosystem well-being. Figure 6.9 depicts the scores for various socio-ecological themes.

None of the scores for the socio-ecological component fell within the highest band. This means that none of the themes in the socio-ecological component could be categorized as making excellent progress towards sustainability. Generally, the perceptions of CCF members on the themes indicated that actions were required to undertake sustainability in almost all the aspects of

the socio-ecological component, with the exception of food distribution and availability as well as energy sources and uses.

Figure 6.9: A graphic representation of the results for the various themes in the socio-ecological component⁴¹



Wastewater and solid waste management were seen as problems for the three districts because of a lack of sanitation facilities, since most people have no toilets and so use dongas. This condition exposes community members to health risks. It indicates that Lesotho needs to improve sanitation services in rural areas to meet the MDG targets for this sustainability issue. Other risks are related to the pollution of water-courses. Under water sources, there was

⁴¹ The scale 0-50 represents scores for various themes as described earlier in Table 6.9.

concern for wetlands, which were being trampled by livestock. Qacha's Nek had a much higher score for the "sense of place" theme indicating a good start towards sustainability than Mokhotlong and Butha Buthe, which needed to undertake actions towards sustainability. Mokhotlong was similar to Butha Buthe in all the seven themes while it had similarities to Qacha's Nek for about three themes. This is strange because Mokhotlong and Qacha's Nek are found in the mountains while Butha Buthe is located in the lowlands. It would be expected that mountain districts would be more similar. The descriptions of the themes, their relevance to biodiversity conservation and key issues identified for awareness-raising, are outlined in Table 6.10.

Table 6.10: Description of themes under socio-ecological component, their relevance to biodiversity conservation and key issues for awareness-raising

Aspect	Description from CSA approach	Relevance to biodiversity conservation and awareness raising	Key issue (s)	Comments on awareness raising
Energy sources and uses	<ul style="list-style-type: none"> Renewable, non-toxic energy sources are used for heating and sources of power in the community. Using village-based integrated renewable energy systems. 	<ul style="list-style-type: none"> Biomass needs to be used in such a way that the biodiversity of trees used for wood is not threatened. This is because the use of biomass for fuel is one of the key threats to biodiversity in the study area. 	<ul style="list-style-type: none"> Renewal of wood through tree planting and collection of dead trees. 	<ul style="list-style-type: none"> Qacha's Nek needed to identify and undertake actions towards sustainability while the other two areas needed to improve on the current condition
Wastewater and waste pollution management	<ul style="list-style-type: none"> Human waste and wastewater is used and/or disposed of to the benefit of the environment and community. 	<ul style="list-style-type: none"> Threats to water sources due to unhygienic wastewater management systems. This might affect the diversity of organisms living in the water sources in the long term. 	<ul style="list-style-type: none"> Adequate management of sanitation; prevention of water pollution locally and for downstream users. 	<ul style="list-style-type: none"> All three needed to undertake actions towards sustainability.
Water sources quality and use patterns	<ul style="list-style-type: none"> Availability of a clean, renewable water supply. Community members are aware of their water sources. 	<ul style="list-style-type: none"> Related to the protection of wetlands in the MDTP area, which are important water production engines for both local communities in the 	<ul style="list-style-type: none"> Knowledge, respect and protection of water sources. 	<ul style="list-style-type: none"> All three needed to undertake actions towards sustainability.

Aspect	Description from CSA approach	Relevance to biodiversity conservation and awareness raising	Key issue (s)	Comments on awareness raising
	<ul style="list-style-type: none"> Community members respect, protect and conserve their water sources 	<p>mountains of Lesotho and downstream users in Lesotho and three other countries in the Orange River catchment area.</p> <ul style="list-style-type: none"> Wetland diversity is currently threatened by being trampled by livestock. 		
Consumption patterns and solid waste management	<ul style="list-style-type: none"> Consumption and generation of waste is minimized Fostering of ecological business principles Assessing the life cycle of all products used in the community 	<ul style="list-style-type: none"> Related to consumption patterns and waste management practices that consider conservation of soil, water and air and support biodiversity. 	<ul style="list-style-type: none"> Recycling of waste and knowledge about management of trash. 	<ul style="list-style-type: none"> All three needed to undertake actions towards sustainability.
Physical infrastructure, buildings and transportation	<ul style="list-style-type: none"> Structures are designed to blend with and complement the natural environment, using natural, bioregional and ecologically sound (renewable, 	<ul style="list-style-type: none"> Since most building structures in the rural mountain areas are made from locally available materials, there are threats to over-harvesting of thatch grass and trees for construction. Over- 	<ul style="list-style-type: none"> Building materials used are natural and recyclable or reusable making their use sustainable; applying conservation methods of 	<ul style="list-style-type: none"> Mokhotlong needed to identify and undertake actions towards sustainability while the other two needed to improve on

Aspect	Description from CSA approach	Relevance to biodiversity conservation and awareness raising	Key issue (s)	Comments on awareness raising
	<p>non-toxic) materials and methods of construction</p> <ul style="list-style-type: none"> • Conservation is practiced in transportation systems and methods 	<p>harvesting of plants for the construction of houses is a threat to biodiversity. Also, most huts are built using soil, which threatens biodiversity because of land degradation due to erosion caused by the digging of soil.</p> <ul style="list-style-type: none"> • Furthermore, stones and rocks are used for the construction of huts. These need to be quarried with considerable impacts on biodiversity as well. 	<p>transport such as trail systems for walking and horse riding in areas rich in biodiversity.</p>	<p>current practices.</p>
<p>Food availability, production and distribution</p>	<ul style="list-style-type: none"> • Food availability • Food accessibility • Food affordability 	<ul style="list-style-type: none"> • Food production is directly related to land conservation. Land degradation, as a component of ecosystems, needed to be managed well to support food production within communities in the long-term and to manage threats posed by the encroachment of fields on areas rich in biodiversity. • Also, wild plants are 	<ul style="list-style-type: none"> • Bio-safety aspects related to using hybrid seeds sold in commercial corporations. 	<ul style="list-style-type: none"> • All three needed to improve current conditions.

Aspect	Description from CSA approach	Relevance to biodiversity conservation and awareness raising	Key issue (s)	Comments on awareness raising
		<p>harvested for food especially during times of drought, when cultivated crops need to be supplemented. Furthermore, herbs and medicinal plants are relied on for health and also need to be harvested in a sustainable manner to avoid biodiversity loss.</p>		
Sense of place	<ul style="list-style-type: none"> • Connection of community members to the place in which they live. • Boundaries, strengths, weaknesses and rhythms of the place communities live in are clear to community members. • Community members live in synchrony and harmony within the ecological system of which they are a part. • Natural life, its 	<ul style="list-style-type: none"> • Directly related to biodiversity conservation issues in many aspects including the diversity of species, habitats and populations of fauna and flora. 	<ul style="list-style-type: none"> • Native plants and wildlife habitat: Increase numbers of people with knowledge; active support and enhancement, reclamation when disturbed by human activity. • Increase in the depth of humus annually. • Reduction of species diversity for both fauna and flora. • Change in the general health of the environment 	<ul style="list-style-type: none"> • Qacha's Nek needed to improve current conditions and activities while the other two needed to identify and undertake actions towards sustainability.

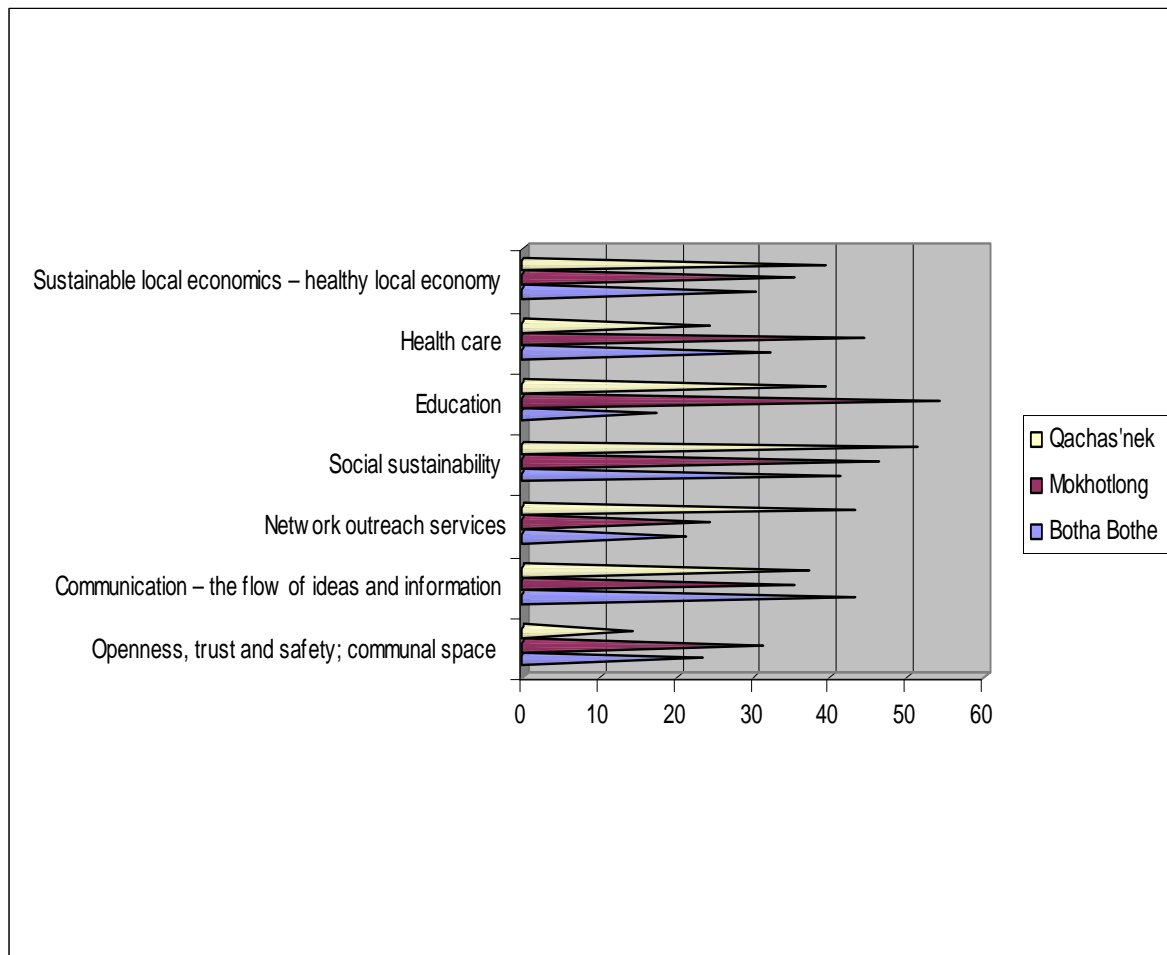
Aspect	Description from CSA approach	Relevance to biodiversity conservation and awareness raising	Key issue (s)	Comments on awareness raising
	<p>systems and processes are respected.</p> <ul style="list-style-type: none"> • Wildlife and botanical habitat is preserved. • Lifestyles of community members regenerate, rather than diminish the integrity of the environment. 		<p>over the last year covering soil and water.</p> <ul style="list-style-type: none"> • Extent to which community members actively plan conservation of dwindling natural resources in consideration of the needs and enjoyment of future generations (e.g. through tree planting, non-native species removal). • Extent to which community members actively participate in environmental conservation and restoration activities. 	

Source: Author's construction.

3.2 The socio-economic component

Themes under the socio-economic component cover issues related to recognizing and relating to others; sharing common resources and providing mutual aid; emphasizing holistic and preventative health practices; providing meaningful work and sustenance to all members; integrating marginal groups; promoting unending education; encouraging unity through respect for differences; and fostering cultural expression. Figure 6.10 compares these themes for the three districts. Qacha's Nek was making progress towards sustainability concerning social sustainability. There was a good start towards sustainability for sustainable economics or a healthy local economy, education, network outreach services and communication. Regarding openness, trust and safety, actions were needed to undertake sustainability. Mokhotlong had excellent progress towards sustainability for education while five themes of sustainable economies, health care, social sustainability, communication as well as openness, trust and safety indicated a good start towards sustainability. Only one theme regarding networking and outreach services needed actions to undertake sustainability. Butha Buthe did not have a theme where it was making excellent progress towards sustainability. There was a good start towards sustainability for four themes of sustainable economics, health care, social sustainability and communication. Actions were needed to undertake sustainability for three themes of openness, trust, safety and communal space; networking and outreach services and education. The findings of the three districts were relatively similar for four themes which indicated a good start towards sustainability: sustainable economics, health care, social sustainability and communication. The other themes showed marked differences between the districts.

Figure 6.10: A graphic representation of results depicting themes on the socio-economic component⁴²



The description of themes, their relevance to biodiversity and comments on awareness-raising are in Table 6.11.

⁴² The scale 0-50 represents scores for various themes as described earlier in Table 6.9.

Table 6.11: Description of themes under the socio-economic component, their relevance to biodiversity conservation and key issues for awareness-raising

Aspect	Description from CSA approach	Relevance to biodiversity conservation and awareness raising	Comments for awareness raising
Openness, trust and safety, communal space	There is a sense of social stability and dynamism in community life; a foundation of safety and trust enables individuals to freely express themselves to the benefit of all.	This is important for communities to work together within biodiversity conservation institutions.	Butha Buthe and Qacha's Nek needed to take action while Mokhotlong needed to improve.
Communication, flow of ideas and information	Spaces and systems are available that support and maximize communication, relationships and productivity.	For education, awareness and updating with regard to biodiversity conservation issues.	All needed to improve action.
Network outreach services	There are adequate opportunities/technologies for communication within the community and for connecting appropriately with the world-wide community.	Building on the successes and failure of biodiversity conservation practices in other places in Lesotho and beyond.	Butha Buthe and Mokhotlong needed to take action while Qacha's Nek needed to improve.
Social sustainability	<p>The talents, skills and other resources of the community are shared freely within the community and offered outside the community to serve the greater good.</p> <p>Diversity is honored as a source of health, vitality and creativity in the natural environment and in community relations.</p> <p>Acceptance, inclusivity and transparency foster understanding of the benefits of diversity, enriches the environmental and social experience and promotes justice.</p>	<p>Talents, skills and resources are used to improve socio-economic as well as ecosystem well-being for the benefit of all community members.</p> <p>Benefits from biodiversity and ecosystems services are shared equitably between all community members.</p>	Butha Buthe and Mokhotlong needed to improve while Qacha's Nek needed to maintain.

Education	Personal growth, learning and creativity are valued and nurtured; opportunities for teaching and learning are available to all age groups through a variety of educational forms.	Learning opportunities towards supporting and sustaining biodiversity conservation initiatives inside and outside protected areas.	Butha Buthe needed to take action while Mokhotlong needed to maintain while Qacha's Nek needed to improve.
Health care	Options for restoring, maintaining or improving health (physical, mental, emotional and spiritual) are available and affordable, including natural remedies and alternative health practices - such as meditation and body work.	Healthy community members to conserve biodiversity and use it in a sustainable manner.	Butha Buthe and Mokhotlong needed to improve while Qacha's Nek needed to identify and undertake actions.
Sustainable local economies, healthy local economy	The flow of resources - giving and receiving of funds, goods and services - is balanced to meet the community's needs and wishes. Surpluses are shared.	Protecting biodiversity to supply various ecosystems services and obtain environmental income.	All needed to improve.

Source: Author's construction.

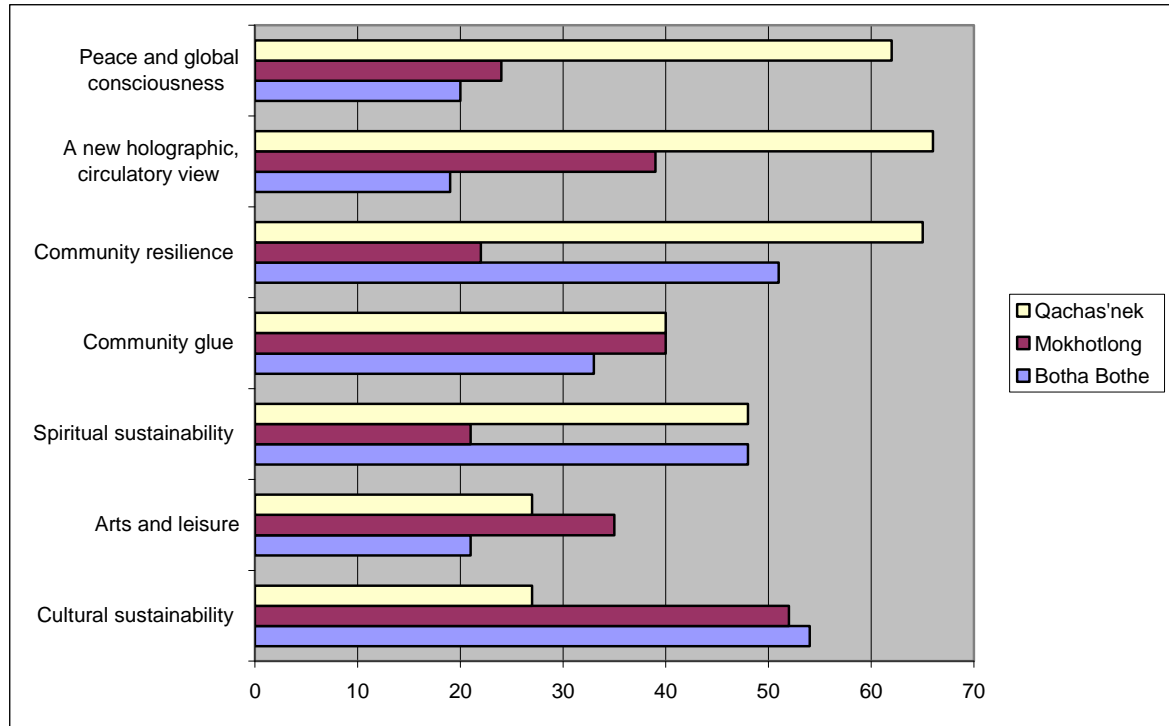
The scores of three development nodes indicated that they had made a good start towards sustainability for three of the aspects dealing with communication, social sustainability, and a sustainable healthy economy. Qacha's Nek had made excellent progress on the aspect of social sustainability. Butha Buthe and Qacha's Nek needed to take action towards sustainability on the aspects of openness, trust and safety. Their low score was related to stock theft. Butha Buthe and Mokhotlong needed to take action towards sustainability regarding the aspect of networking, outreach and communication, while Qacha's Nek had a good start towards sustainability on this aspect. On the other hand, Qacha's Nek needed to take action to realize the sustainability of health care, while Butha Buthe and Mokhotlong had a good start towards sustainability on this aspect. Mokhotlong had scores that indicated excellent progress towards sustainability in the aspect of education while for Qacha's Nek there was a good start towards sustainability and at Butha

Buthe action was needed to realize sustainability on this aspect. The findings on only one theme of community glue were similar for the three districts with an indication of a good start towards sustainability. Mokhotlong and Butha Buthe had similar findings on three themes regarding peace and global consciousness, community glue and cultural sustainability. Mokhotlong and Qacha's Nek had two similarities for community glue and arts and leisure while Butha Buthe had similarities to Qacha's Nek for three themes community resilience, spiritual sustainability and community glue.

3.3 The socio-cultural and spiritual component

The socio-cultural and spiritual component covers themes such as shared vision and agreements that express commitment; cultural heritage and the uniqueness of each community; shared creativity, artistic expression, cultural activities, rituals and celebrations; respect and support for spirituality manifesting in many ways; sense of community unity and mutual support; flexibility and successful responsiveness to difficulties that arise; understanding of the interconnectedness and interdependence of all the elements of life on Earth and the community's place in, and relation to, the whole; and creation of a peaceful, loving, sustainable world. Figure 6.11 presents a comparison of the three districts on the themes of the socio-cultural and spiritual component.

Figure 6.11: A graphic representation of results depicting themes on the socio-cultural and spiritual component⁴³



Qacha's Nek was making excellent progress on three themes of peace and global consciousness, a new holographic and circulatory worldview, community resilience. On two themes of community glue and spiritual sustainability it was making a good start towards sustainability. And on two themes of arts and leisure and cultural sustainability actions were needed to undertake sustainability. Mokhotlong was making excellent progress towards sustainability regarding cultural sustainability only. For three themes of a new holographic and circulatory worldview, community glue and arts and leisure, there was a good start towards sustainability. Regarding peace and global consciousness, community resilience and spiritual sustainability actions were needed to undertake sustainability. Butha Buthe had excellent progress towards sustainability on two themes, community resilience and cultural sustainability.

⁴³ The scale 0-50 represents scores for various themes as described earlier in Table 6.9.

There was a good start towards sustainability for spiritual sustainability and community glue. Actions were needed to undertake sustainability concerning a new holographic and circulatory worldview as well as arts and leisure. The description of themes, their relevance to biodiversity conservation and key issues for awareness-raising concerning the socio-cultural and spiritual component are in Table 6.12.

Table 6.12: Description of themes under the socio-cultural and spiritual component, their relevance to biodiversity conservation and key issues for awareness-raising

Aspect	Description	Relevance to biodiversity conservation and awareness raising	Comments on awareness raising
Cultural sustainability	Respect and support for cultural and artistic enrichment and expression, and spiritual diversity of communities.	Enhancement of cultural expression to sell to tourists in the form of dance and other things. Application of cultural practices that can enhance biodiversity conservation and enhance security of livelihoods.	Mokhotlong and Butha Buthe needed to maintain current cultural activities while Qacha's Nek needed to improve on cultural activities.
Arts and leisure	Creativity and the arts are seen as an expression of unity and interrelationship to communities and are encouraged and supported through various forms of artistic expression, artful living and through preservation and sharing of beauty and aesthetic values. Leisure time is valued.	Using creativity and arts as a tourism package to sell things such as crafts to tourists. Recognition of the importance of leisure time especially for tourist so that community members do not throw stones at them but ensure an atmosphere where tourists can enjoy their leisure time.	Butha Buthe needed to identify and take action towards sustainability while Mokhotlong and Qacha's Nek needed to improve.
Spiritual sustainability	Respect and support for spirituality manifesting in many ways. Opportunities are available for the	Bringing unity to the community so that socio-economic and ecosystem enhancement strategies can be executed within	Butha Buthe and Qacha's Nek needed to improve while Mokhotlong needed to identify and take action towards

	development of the inner-self. A sense of joy and belonging is fostered through rituals and celebrations.	an atmosphere of peace and stability.	sustainability.
Community cohesion	Qualities and commonalities at the heart of a community provide unity and integrity to community life. Existence of a common vision and agreements that express commitments; shared cultural beliefs, values and practices that define and express the uniqueness of communities.	Working together towards a common goal to realize benefits for both ecosystem and human well being in the long term.	All three areas needed action to improve sustainability.
Community resilience	Capacity for flexibility and successful responsiveness to difficulties that arise.	Tourism industry in the highlands is seasonal and communities need to have other ways of living when the business is low and they have to rely on other means of survival.	Butha Buthe and Qacha's Nek needed to maintain current actions while Mokhotlong needed to identify and take action.
A new holographic circulatory view	Existence of a growing understanding of the interconnectedness and interdependence of all the elements of life on Earth; community members know their place in relation to the whole.	Understanding the implications of managing biodiversity in a sustainable manner for local and other communities elsewhere, and also how activities beyond the local community affect local actions and responsibilities.	Butha Buthe had to take action, Mokhotlong needed to improve and Qacha's Nek needed to maintain.
Peace and global consciousness	Community members consciously choose and contribute to the creation of a peaceful, loving, sustainable world.	Creation of an environment conducive to undertaking sustainability actions for biodiversity conservation in the area.	Butha Buthe and Mokhotlong needed to identify and take action while Qacha's Nek needed to maintain.

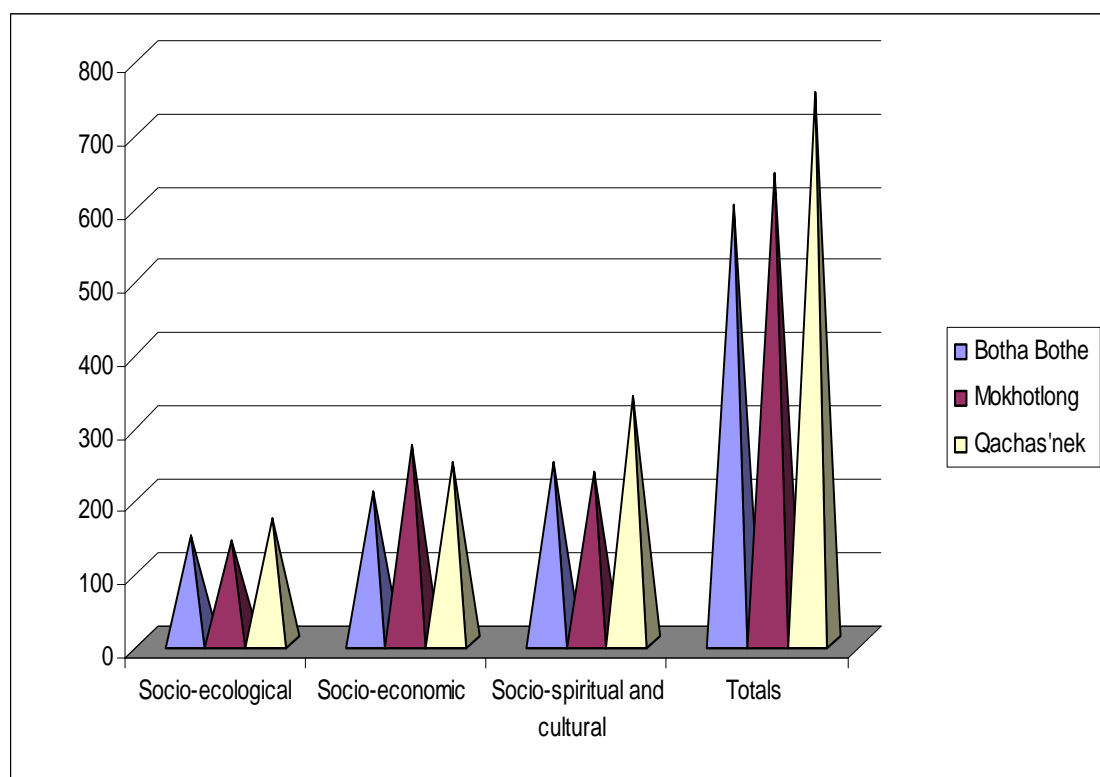
Source: Author's construction.

The following section deals with the overall results, comparing the three components in the three districts.

3.4 Overall results

The overall results are depicted in Figure 6.12. The findings indicate that all three components could not be categorized as making excellent progress towards sustainability.

Figure 6.12: A graphic representation of results depicting themes on the socio-ecological, socio-economic, socio-cultural and spiritual component as well as totals⁴⁴



The scores were in the lowest band for the socio-ecological component for all three development nodes. These scores indicate that actions need to be identified to create conditions that support biodiversity conservation. The scores for the socio-economic and socio-cultural and spiritual components were within the middle band, indicating that improvements needed to be made

⁴⁴ The scale 0-800 represents scores for the overall CSA score and the scores for the components as described earlier in Table 6.9.

towards the sustainability of biodiversity conservation. The scores are relatively similar, which shows that the three development nodes have similar problems and threats. More threats are related to the sustainability of ecosystems than human systems. Qacha's Nek had slightly higher values for the overall scores as well as the socio-ecological component and socio-cultural and spiritual component.

On the basis of the scores and discussions, members of the CCFs identified specific themes on which to focus and raise awareness. The number of themes and the type of message for awareness-raising for the three components are presented in Table 6.13.

Table 6.13: Quantification of themes for awareness raising and community sensitization per development node⁴⁵

	Maintain the status quo			Improve the condition towards sustainability			Identify and begin to undertake actions towards sustainability.			Totals
	BB	M	Q	BB	M	Q	BB	M	Q	
Total Number of themes	7			7			7			21
Socio-ecological	0	0	0	3	2	4	4	5	3	21
Socio-economic.	0	0	1	4	6	4	3	1	2	21
Socio-spiritual and cultural	2	1	3	2	3	4	3	3	0	21
Total	2	1	4	9	11	12	10	9	5	63

According to results in Table 6.13, the conditions conducive to the sustainability of biodiversity conservation are better for Qacha's Nek than the other two development nodes. Table 6.13 also indicates that Qacha's Nek had more themes on which the awareness-raising message would focus on

⁴⁵ The values in the table were allocated and calculated on the basis of the results of the various aspects covering socio-economic, socio-ecological and socio-cultural and spiritual dimensions from Tables 6.10, 6.11, 6.12.

maintenance of the status quo, followed by Butha Buthe with Mokhotlong in the last position. The number of themes in which awareness-raising campaigns would focus on improvements in the activities and conditions, were higher for Qacha's Nek, followed by Mokhotlong, with Butha Buthe in the last position. Awareness raising messages, which focused on identifying actions to be taken to change the status quo, are higher for Mokhotlong and Butha Buthe and lower for Qacha's Nek.

While the requirements for improvements are fairly similar for the three areas, it was expected that Mokhotlong and Qacha's Nek would be similar in most aspects but would differ from Butha Buthe. This is because they are both located in the mountain eco-region while Butha Buthe is located on the lowlands. Contrary to expectations, the results for Butha Buthe were found to be very similar to those for Mokhotlong for the themes that require that the status quo be maintained, as well as for the themes that require action to achieve sustainability.

The findings of the discussions with CCFs revealed that they are conversant with issues and threats to biodiversity. On the other hand, they indicated that at the community level there is a lack of awareness regarding threats to biodiversity. The issue of awareness-raising was also raised as a priority for the human subsystem at the district level. The following subsection presents some of the key findings regarding the awareness of community members in the context of biodiversity.

3.5 Main issues from the perceptions of members of the general community

When asked about their opinion on whether biodiversity is threatened or not, members of the general community, who were not part of the CCFs, revealed the following:

- They did not know the local terminology used for biodiversity by MDTP partners at district and community levels, hence the terms *natural resources* and *ecosystem services* were used to engage in discussions related to biodiversity conservation.
- They were aware of their dependence on nature for their livelihoods. While they were aware, their practices related to natural resources indicate that they take the availability of these resources for granted. They believe that things will remain as they have always been, for years to come.
- They were not aware of the threats to biodiversity and the related ecosystems services in their area.
- Some of the members were not aware of the benefits of biodiversity, especially with regard to wetlands. On the contrary, they were of the opinion that wetlands are a nuisance to their livestock and should be filled and converted to arable land. This perspective conflicts with international requirements for the protection of wetlands as stipulated by the Ramsar Convention, as well as the SADC Convention on shared water courses.
- They emphasized the need for employment creation and poverty alleviation as prerequisites for community members to engage in biodiversity conservation initiatives. They did not see biodiversity conservation as a priority, because the benefits are not immediate.

4 SUMMARY OF FINDINGS

The summary of findings is presented under themes related to research questions and practical objectives articulated in Chapter 1 and presented in Table 6.14. This summary focuses on the product of the application of a SA in the MDTP, and dwells on the practical objectives of the thesis. Theoretical objectives on lessons emerging from the findings are discussed in the following chapter.

Table 6.14: Research questions and objectives

Research question	Corresponding research objective(s)
What aspects should be considered to make SAF for biodiversity conservation effective?	<ul style="list-style-type: none"> Determine key components of a PSAF to guide stakeholders in making decisions that enhance the sustainability of biodiversity conservation in rural areas.
How can participation be effectively incorporated into SA?	<ul style="list-style-type: none"> Engage stakeholders in a debate to allow for reflection and learning about sustainability issues impacting on biodiversity conservation.
What are the perceptions of stakeholders on the ecosystem and human conditions required for the sustainability of biodiversity conservation?	<ul style="list-style-type: none"> Identify issues, which need to be addressed and assessed, to ensure the sustainability of biodiversity conservation.
What are stakeholder perceptions on progress towards sustainable development in the MDTP area?	<ul style="list-style-type: none"> Identify and analyze perceptions of stakeholders on progress towards sustainability.

Source: Author's construction.

4.1 Elements for the effective development and application of a sustainability assessment framework for biodiversity conservation

The SA process conducted in the MDTP considered the following elements for the effective development and application of a SAF:

- *Overall driver for undertaking the SA:* Promotion of integrated and holistic planning as well as decision-making for the sustainability of biodiversity conservation for rural areas in the MDTP area. The SA was applied to create a holistic vision of sustainable development. This vision incorporated the social, economic and environmental aspects of biodiversity conservation. Hence the SA process provided integrated information for relevant decision-making levels.
- *Requirements and preferences for the effective incorporation of participation:* Collaboration and community empowerment for partners

- at the lower decision-making levels; and consultation with national level partners and members of the general community were required.
- *Application of SA:* Both retrospective through semi-quantitative assessment of sustainability at the local community level and partially prospective by identifying dimensions, elements and indicators for assessing sustainability of future undertakings in the MDTP area.
 - *Main features of a SA toolkit:* This consisted of a combination of two tools, which were modified, and used procedures that were qualitative and semi-quantitative, and also involved the identification of sustainability indicators.
 - *Key features of the SA process:* The process was characterized by:
 - Inclusion of broad sustainability objectives covering socio-economic and biophysical issues.
 - Emphasis on existing initiatives at the lowest levels of decision-making, and the implications to all sectors of society of their practices in the long term and short term.
 - Addressing significant existing practices and initiatives at the district and local levels to show how they are connected to the requirements at the strategic levels.
 - Application of appropriate SA tools to existing activities and practices.
 - Systemic, hierarchical, logical, communicable and simple SAF, using local language.
 - Going beyond the minimization of adverse impacts and identifying ways to achieve and enhance, multiple and mutually supportive positive outcomes for both ecosystem and human well-being issues required for an environment conducive to the sustainability of biodiversity conservation.

- Integration into a more comprehensive framework, considering biodiversity conservation within wider sustainability issues.
- Transparency, openness and the incorporation of stakeholder participation with highest degree of participation at the lower levels of decision-making.
- Capacity building at community level to self-assess progress towards sustainability.
- Advocacy on context-specific and adaptive design, as well as reflections for collective learning.
- Making contributions and being complementary to several initiatives, including strategic planning, decision-making, and project intervention design, by supplying information and indicators for monitoring, evaluation and impact analysis, and also raise awareness about sustainable development issues.
- Combination of narrative and indicator-based procedures.
- *Key tasks served by the SA process:* Both retrospective and prospective tasks were served. Retrospective assessment of progress was achieved at the community level, towards or away from sustainability. The prospective design of a SAF to be used for assessing proposed undertakings in addition to existing practices was achieved.
- *Specific functions served by the parts and aims of the SAF:*
 - Indication of vital constituents of the system under assessment
 - Assessment of each part only once to guarantee efficiency
 - Incorporation of all critical constituents
 - Prioritization of parts based on their values
 - Indication of the basis for proposed parts and associated values
 - Appraisal of key relationships between the parts
 - Arrangement of relevant indicators to the systems

- *Application of the principles of SA:* There was compliance with most of the principles, although these were not discussed as principles per se. Principles with partial compliance were related to the data handling purposes of the SA.
- *Relevance of sustainability-led decision-making criteria:* All criteria were relevant to all decision-making levels but were not considered in the design of the SAF for the MDTP. The significance of these criteria was recognized by the MDTP partners but not acknowledged by members of the general community due to a lack of awareness. The need exists for awareness-raising for the application of sustainability-led decision-making criteria at all levels.
- *Process needs as opposed to data needs met by the SA:* The needs met included:
 - clarification and provision of solid rationale for project action priorities;
 - raising awareness on how ecosystem well-being and human well-being are interconnected;
 - gaining organizational consensus regarding the focus of interventions;
 - stimulating critical debate on a broad vision for the sustainable development of biodiversity and how to assess it;
 - enhancing local ownership of the project and its interventions.
- *Direct and indirect users of the SA process:* Direct users of the SA process were district and community level partners of the MDTP, while indirect users were national level partners of the MDTP and members of the general community in the MDTP area.

4.2 Effective incorporation of participation into a sustainability assessment process

Effective incorporation of participation within an SA process entailed the following:

- Stakeholders decide on the appropriate perspective of sustainability.
- Sustainability of existing activities assessed and measured against perspectives and values of stakeholders.
- Framework created on the basis of stakeholder values and perceptions.
- Higher degrees of participation for direct users emphasizing collaboration and empowerment.
- Lower degrees for indirect users through information giving and consultations.
- Different types of participatory techniques based on the degree of participation, type of stakeholder group and task of SA.
- Role or participation of external expert as a facilitator and advisor not as assessor of sustainability.

4.3 Ecosystem and human conditions required for the sustainability of biodiversity conservation

Several conclusions can be extracted from the results regarding stakeholders' perceptions of ecosystem and human conditions. These conditions need to be assessed to inform decision-making regarding the sustainability of biodiversity conservation for rural areas in the MDTP area.

- Sustainability objectives of all MDTP partners at national, district and local levels were aligned with the policy and legal requirements for biodiversity conservation.
- Existence of a fragmented and silo mentality towards sustainability at national level as opposed to district level, where there was a holistic and integrated mentality with regard to aspects of both ecosystems and human well-being.
- Sustainability aspirations of local community members, who were not aware of threats to biodiversity conservation, conflicted with those of others at higher decision-making levels.

- Few differences, and remarkably more similarities, of sustainability aspirations mentioned by members of the DSCs from the three development nodes.
- Human well-being issues that were raised with regard to the vision were related to issues such as the allocation of sites for biodiversity conservation and tourism, employment creation, awareness, and the creation of institutions to deal with biodiversity and tourism development in the area.
- Ecosystem well-being issues were related to the management of grazing, soil and land conservation, sustainable resource use, species conservation, the creation of protected areas, and the protection of wetlands and cultural landscapes.
- Ecosystem and human dimensions selected were associated mostly with provisioning ecosystem services such as food, fodder, fuel, thatch grass, and medicines.

4.4 Stakeholder perceptions of progress towards sustainability

These points summarize stakeholder perceptions of progress towards sustainability.

- None of the three sustainability components from the CSA were making excellent progress towards sustainability.
- Progress towards sustainability for ecosystem well-being lags behind human well-being.
- The scores were in the lowest band for the socio-ecological component for all three of the development nodes, indicating that actions need to be identified to create conditions that support biodiversity conservation.
- The scores for the socio-economic and socio-cultural and spiritual components were within the middle band, indicating that improvements need to be made towards the sustainability of biodiversity conservation.

- The scores are relatively similar portraying that the three development nodes have similar problems and threats.
- More threats are related to the sustainability of ecosystems than to human systems.
- Qacha's Nek had slightly higher values for the overall scores as well as for the socio-economic and socio-cultural and spiritual components. This implies that conditions conducive to the sustainability of biodiversity conservation are better for Qacha's Nek than the other two development nodes.
- While Mokhotlong and Qacha's Nek are both located in the mountain eco-region of Lesotho, their conditions of sustainability differ. Instead Mokhotlong has results similar to those for Butha Buthe, which is located on the lowlands.

In conclusion the SA process and key components of a SAF for biodiversity conservation in rural areas was determined by the tasks, values, and preferences of the intended audience and stakeholders. Hence it is called "participatory". Having categorized the findings on the basis of research questions and objectives, the following chapter discusses these findings and provides practical and theoretical implications for the field of SA.

CHAPTER SEVEN

DISCUSSION, CONCLUDING REMARKS, LESSONS AND GUIDELINES

1 INTRODUCTION

The preceding chapters reveal that the assessment of progress towards the sustainability of biodiversity conservation in rural areas requires the application of participatory SA approaches. The effective development and application of PSAFs is imperative to address threats posed by human activities to biodiversity conservation. However, experience and details of how to identify key components of a SAF and apply these participatory SA approaches specifically for biodiversity conservation in rural areas, is a challenge. This chapter presents discussions and conclusions by extracting core insights from preceding chapters regarding the application of a participatory SAF for biodiversity conservation in rural areas. It is divided into five main sections. The first section covers the discussion of findings using four themes associated with the summary of findings in the preceding chapter (Chapter Six):

- Elements for the effective development and application of SAF for biodiversity conservation.
- Effective incorporation of participation into a SA process.
- Ecosystem and human conditions required for the sustainability of biodiversity conservation.
- Stakeholder perceptions on progress towards sustainability.

The next section is devoted to lessons learned while applying SA in the MDTP context. It is followed by an analysis of the strengths, weaknesses,

opportunities and threats in applying SA. A section on guidelines for conducting a participatory SA for biodiversity conservation in rural areas follows. The last section gives suggestions for future research.

2 DISCUSSION OF FINDINGS

2.1 Elements for the effective development and application of a sustainability assessment framework for biodiversity conservation

This section discusses the findings of various key aspects of the participatory SA process conducted in rural areas in which the MDTP was implemented.

2.1.1 Overall purpose and entry point for undertaking sustainability assessment in the Maloti Drakensberg Transfrontier Project area

The overall purpose for undertaking SA in the MDTP was to reflect on and learn how the integrated planning of biodiversity conservation interventions could be made sustainable. The integrated planning processes provided an entry point for the application of SA. This is in line with the suggestions by Dalal-Clayton and Sadler (2004) who indicate possible entry points for the application of SA in developing countries as either EA or integrated planning. Using EA as an entry point for SA requires that SA be applied within a hierarchy of other EA tools such as EIA and SEA. This is important to ensure that SAFs display scientific accuracy and do not undermine environmental issues. In the case of the MDTP SA, the emphasis was on promoting environmental sustainability, specifically biodiversity. Hence, using integrated planning as an entry point for SA did not threaten environmental sustainability.

2.1.2 Similarities in sustainability aspirations among district level participants

While workshops were conducted for members of DSCs in three different districts, their sustainability aspirations were strikingly similar. They stressed similar expectations of the participatory SA process: a) a long term vision of socio-economic and ecological sustainability for the MDTP area; b) consensus on the strategic components required to realize the vision; c) a SA framework to be used for gauging progress towards or away from the vision; d) perceptions of the partners of key sustainability issues that need to be tackled. Collaborative visioning with the aim of realizing sustainability is a vital requirement for SA and is emphasized by numerous authors (IISD, 1997; UNEP, 2003; Dalal-Clayton & Sadler, 2004; Turnpenny, in press). Borrini-Feyerabend *et al.* (2004) concurs that visioning is imperative for formulating agreements within collaborative management partnerships between biodiversity conservation agencies and local communities. Visioning follows immediately after the establishment of partnerships. From the visioning exercise, action plans are designed, then executed and monitored to assess progress towards the vision. These prerequisites given by Borrini-Feyerabend *et al.* (2004) characterized the MDTP SA process. MDTP conducted visioning after establishing partnerships at the various decision-making levels from bi-national to local levels. The visioning exercise was conducted so that it complemented action planning, leading to subsequent implementation, monitoring and evaluation. The results of the visioning contributed to the design of a participatory monitoring and evaluation framework.

2.1.3 Smooth running of the visioning process and self-audit

The processes of sustainability visioning undertaken at the district level and self-assessment at the community level ran smoothly. Participants discussed, reflected, learned and made decisions together in a relaxed atmosphere. They also reached consensus on discussion issues without heated debates or

conflicts. Guijt & Moiseev (2001a) indicate that when stakeholders are not from diverse backgrounds it is easier to formulate a vision of sustainability and goals. These stakeholders were from diverse backgrounds. However, they had received similar awareness information about biodiversity issues and had worked together on several issues prior to visioning and self-assessment. This indicates that undertaking visioning or self-assessment requires that partnerships should be established beforehand. Then the partners need to be educated on the sustainability issues in question. Also, partners should have working relationships spanning at least a year or two. This will result in the visioning and self-assessment processes becoming, smoother, quicker and trouble free.

2.1.4 Emphasis of reflection, learning and participation during the sustainability assessment process

The MDTP emphasized reflection, learning and participation in the SA process. This is because it acknowledged that stakeholder input is vital for determining a context-specific definition of sustainability. Thus a participatory or people-centred approach to SA was adopted to define sustainability in terms of what needs to be sustained, by whom and for whom. The role and significance of adopting a people-centred approach to sustainability is given by Wiek & Binder (2005) as enabling affected people to express and discuss their values, concerns and aspirations regarding the sustainability issue in question. Lee (2006) proposes a people-centred approach, which complements an expert-based or technical approach. The basis of a people-centred approach is an assessment framework that is common to, or has been agreed to, by stakeholders, practitioners and researchers. The participatory SA process within MDTP followed an approach similar to the requirements of a common assessment framework. Conversely, among the SA approaches reviewed in Chapter 3 it is apparent that there are fewer people-centred approaches compared to expert-based approaches. Even among the people-centred

approaches most SA tools are too technical for self-assessment at the community level. For instance, while the IUCN approach emphasizes a participatory approach, at the community level its application requires external expertise and communities cannot apply it themselves. To address this limitation within the MDTP SA process, CSA had to be introduced to complement the IUCN approach to ensure that the SA process was people-centred at both district and community levels.

2.1.5 Suitable tool(s) for conducting sustainability assessment

Suitable SA tools were selected to meet the tasks required by the MDTP. It was found that no single SA tool could address all tasks connected to sustainability. Tabara *et al.* (2007) also agree with this statement and advocate the application of a toolkit consisting of appropriate SA tools. Furthermore, Waage *et al.* (2005) concur with the idea of a toolkit and further suggest that tools within a toolkit need to be organized in a hierarchical manner to make the choice of SA tools easier for non-SA practitioners and decision makers. Hence relevant tools were identified, presented to participants, discussed, modified, tested and applied to the MDTP situation. The tools preferred and used in the MDTP SA context yielded an SAF whose parts and aims achieved the following functions indicated by Dalal-Clayton & Bass (2002): incorporation of all critical and vital constituents for assessing the sustainability of biodiversity; prioritization of parts based on the values and preferences of SA users was allowed; appraisal of key relationships between the parts; the basis for proposed parts and associated values and preferences and the arrangement of relevant indicators were indicated. Other functions, such as the identification of inevitable information gaps and the assessment of each part to guarantee efficiency, were not met because they were more relevant to data handling than reflection. Application of the IUCN SA approach helped to ensure that the SAF is systemic, hierarchical, logical, communicable and simple. Dalal-Clayton & Bass (2002) affirmed that these features are important for effective SAFs.

2.1.6 Nature of assessment procedures

Assessment procedures applied in the MDTP had a combination of qualitative and semi-quantitative features. They also involved the identification of sustainability indicators. According to Pope *et al.* (2004), procedures for assessing sustainability through SEA are predominantly quantitative, while those for SEA are qualitative and, for SA, sustainability indicators are most often used. The MDTP SA process combined the different assessment procedures from three main EA tools (EIA, SEA and SA) to produce an appropriate SAF.

2.1.7 Key features of the sustainability assessment process

The key features of the SA process leaned towards learning and reflection and not to data handling. Table 7.1 presents substantive and process features of effective EA processes as outlined in Gibson *et al.* (2005). During the MDTP SA process, features relevant to the reflective process were complied with while features required for data handling were not (see Table 7.1). This indicates that the substantive and process aspects of an effective SA process are determined by the purpose of SA. Other key features such as ensuring compliance to SA by writing it into law would be impractical to implement in the context of developing countries. This is because EIA is relatively new while the application of SEA is not yet practiced and SA practice is even less known. Dovers (s.a.) also concurs with Gibson *et al.* (2005) that SA should not just play an advisory role but should be institutionalized in law. This would perhaps work better in developed countries, where SEA application is already advanced and SA was introduced some time ago. Therefore, the practical application of SA for biodiversity conservation in rural areas, and in particular in developing countries, will need to be voluntary and flexible as proposed by UNEP (2006) until the application of SEA and SA have been widely introduced.

Table 7.1: Analysis of compliance to substantive and process aspects for effective sustainability assessment processes

Aspects	Compliance
SUBSTANCE	
o Sustainability needs to be defined by stakeholders in their context;	Compliant
o Comprehensive sustainability objectives including human and ecosystems aspects;	Compliant
o Tailoring generic sustainability criteria and trade-off rules to the context and situation at hand;	Non- Compliant
o Cater for both existing and proposed initiatives at all decision- making levels;	Compliant
o Include different sectors and their practices in the long and short term;	Compliant
o Prioritize most significant existing and proposed practices and initiatives at strategic and local levels;	Partially compliant because strategic levels were not the focus of SA instead the emphasis was on district and local levels.
o Interlink strategic and local levels;	Compliant
o Formulate guidelines for decision-making authorities and development proponents before planning so that motivations are aligned with sustainability requirements;	Non- Compliant
o Develop a toolkit of various tools as per task for strategic and local issues;	Compliant
o Go beyond minimization of adverse impacts and identify ways to achieve and enhance multiple and mutually supportive outcomes;	Compliant
o Adopt a precautionary approach to tackle significant uncertainties and knowledge limitations;	Partially Compliant
o Ensure compliance by being written into law	Non- Compliant
PROCESS	
Integrated into a more comprehensive framework that links the strategic and project level assessments;	Compliant
Be transparent, open and incorporate effective participation of stakeholders;	Compliant
Be adaptive and consider utilization of adaptive design.	Compliant

Source: Author's construction.

2.1.8 Key tasks served by the sustainability assessment process

Key tasks served by the SA process were a combination of both retrospective and prospective tasks. Retrospective tasks dealt with the self-assessment or self-audit of progress, towards or away from sustainability at the local community level. Prospective tasks dealt with the development of a procedure and framework to support sustainability assessment for existing practices and proposed undertakings. These tasks are also among the five key tasks to be served by sustainability assessment according to Tabara *et al.* (2007). The other three tasks of sustainability assessment mentioned by Tabara *et al.* (2007) were not addressed by the MDTP SA process. These are i) predictions related to sustainability patterns and trends; ii) assessment of the impact of policies, programmes, plans, or interventions on sustainability; and iii) monitoring the sustainable development process in the long term. These three tasks are relevant to SA within the MDTP for biodiversity conservation, if a data focussed or full SA (combining data handling and visioning) is conducted. These tasks require mostly expert-based approaches, while the two tasks covered by the MDTP SA did not require data handling or expert-based approaches. All five tasks are guided by the development of a SAF.

2.1.9 Levels of decision-making for applicability of sustainability assessment

Levels of decision-making for the applicability of SA in the MDTP, focused on lower levels of decision-making at the district and community levels. This is not in line with the suggestion by Gibson *et al.* (2005), which indicates that effective SA should ideally address all undertakings at all decision-making levels. Depending on the SA task, future application of the SAF in the MDTP needs to consider other decision-making levels, which were not the focus of the current SA process.

2.1.10 Needs met by sustainability assessment

Needs met by SA were closely related to the ongoing activities within MDTP that determined the purpose of the SA. The MDTP SA focused on process needs as opposed to data needs for several reasons. The stage of the project during which a SA was conducted, dealt with integrated planning of initial biodiversity conservation interventions. Integrated planning needed to be guided by a shared and comprehensive vision of sustainability, which mandated collaboration. Also, MDTP needed a process for partners to collectively identify, reflect and learn about issues on which to raise awareness at the community level. Hence, MDTP adopted a combination of top-bottom and bottom-up approaches in conducting the SA. Most biodiversity conservation projects in Lesotho tended to adopt a top-bottom approach, which imposed decisions from higher decision-making levels on lower levels. Consequently, most of them were not sustainable. MDTP thus focused on a participatory approach as a means of securing the sustainability of their achievements. Mokuku (1999) and Esenjor (2005) also revealed that a key problem regarding the sustainability of conservation initiatives in Lesotho is ineffective stakeholder participation. The issue of using a participatory processes in environmental decision making is internationally acknowledged by various authors such as (SAIEA, 2003a; 2004; and 2005a). To draw attention to the significance of an effective process within conservation partnerships, Borrini-Feyerabend *et al.* (2004:138) state that "*quality of process is extremely important, as a partnership is generally as strong, or as weak, as the process that generated it*".

2.1.11 Direct and indirect users of the sustainability assessment

The type of stakeholders who were direct or indirect users of the SA process, related to the levels of decision-making and the perceived roles and responsibilities they had in managing biodiversity. Participants who had more

responsibilities within the SA were direct users while those with fewer responsibilities were indirect users.

2.1.12 Significance of the complementary role of sustainability assessment

The MDTP SA complemented other ongoing processes and activities. It was not conducted as a standalone process. ODPM (2004a; 2004b) advocates this idea of tailoring the steps of an SA with other ongoing processes. This was found to be cost-effective in the MDTP and saved partners time and money by obviating the need to attend different meetings on different processes. Cost-effectiveness in undertaking SA as a complementary process is crucial for developing countries where resources for undertaking SA are scarce.

2.1.13 Compliance to sustainability assessment principles

The MDTP SA process complied with most SA principles, in particular the Bellagio principles mentioned in Chapter 2. An analysis of compliance with these principles is presented in Table 7.2. Principles with partial compliance were related to data handling or future application within SA. Compliance results on the application of SA principles have similarities and disparities to those reported by Walmsley (2002) regarding the development of indicators for catchment management information systems in South Africa. There are marked differences with regard to areas of non-compliance. Aspects of non-compliance reported by Walmsley (2002) related to principles dealing with the creation of sustainability vision, identification of relevant goals as well as broad participation of grassroots communities. Conversely, the participatory MDTP SA process complied with these principles. Areas of non-compliance in the MDTP SA process related to principles related to data handling, which were complied with in the Walmsley study. The applicability of principles is determined by the focus of the SA process and whether it is data or process focused.

2.1.14 Relevance of sustainability-led decision-making criteria

All the sustainability-led decision criteria mentioned in Chapter Two from Gibson *et al.* (2005), are relevant to the MDTP situation. In particular, they provide clear guidance on issues on which awareness needs to be raised at all decision-making levels. The integration of these sustainability-led decision-making criteria into awareness-raising can help decision-making at all levels to adequately address the sustainability issues of biodiversity conservation. Comments on the applicability of these criteria are described in Table 7.3.

Table 7.2: Application of the 1996 Bellagio principles in the MDTP case study

Key features	Principles	Requirements	Conformity/compliance during the design and application of SA in the MDTP
A. POINT OF DEPARTURE	1. GUIDING VISION AND GOALS	<ul style="list-style-type: none"> • Clear vision of sustainable development. • Goals to elaborate vision. 	<ul style="list-style-type: none"> • This was one of the focus areas of the SA for biodiversity conservation in the MDTP.
B. CONTENT, SYSTEM, CONTEXT, PRESENT PRIORITIES	2. HOLISTIC VIEWPOINT	<ul style="list-style-type: none"> • Assessment of overall system and related parts. 	<ul style="list-style-type: none"> • Addressed using both the IUCN SA approach and the CSA
		<ul style="list-style-type: none"> • Address issues of well-being, state, direction and rate of change and interactions between social, ecological, and economic sub-systems. 	<ul style="list-style-type: none"> • Issues of well being, state and interactions between social, ecological and economic sub-systems addressed. • Addressing of direction and rate of change effectively requires data handling and will need to be addressed when SA is applied for data handling.
		<ul style="list-style-type: none"> • Include beneficial and adverse impacts of human activity taking costs and benefits for human and ecological systems. 	<ul style="list-style-type: none"> • Conformity at both district and community levels.
	3. VITAL COMPONENTS	<ul style="list-style-type: none"> • Address intra and inter-generational equity and disparity focusing on issues such as resource use, over consumption and poverty, human rights, and access to services, and ecosystems that supply goods and services for life. 	<ul style="list-style-type: none"> • Addressed at both district and community levels, but in more detail at the community level.
		<ul style="list-style-type: none"> • Address economic growth plus activities that enhance human well-being. 	<ul style="list-style-type: none"> • Addressed at district and community levels with more detail at district levels.

	4. SUFFICIENT SCOPE	<ul style="list-style-type: none"> Temporal scale encompassing both short term and long-term issues for present and future generations. 	<ul style="list-style-type: none"> Partially addressed, especially at the district level, will need to be incorporated in detail during the data handling SA tasks. 	
		<ul style="list-style-type: none"> Spatial scale including local as well as national, regional or international impacts to humans and ecosystems. 	<ul style="list-style-type: none"> Addressed at both district and community levels. 	
		<ul style="list-style-type: none"> Prediction and planning of aspirations and future possibilities on the basis of history and existing situation conditions. 	<ul style="list-style-type: none"> Predictions not addressed and needs to be part of data handling tasks. Planning for aspirations addressed at community and district levels. 	
	5. PRACTICAL FOCUS	<ul style="list-style-type: none"> Precise framework that arranges information categories and also connects vision and goals to indicators and assessment criteria. 	<ul style="list-style-type: none"> Compliant 	
		<ul style="list-style-type: none"> Prioritization of main sustainability issues to be assessed. 	<ul style="list-style-type: none"> Compliant 	
		<ul style="list-style-type: none"> Prioritization of indicator set for appraising progress. 	<ul style="list-style-type: none"> Compliant 	
		<ul style="list-style-type: none"> Establish possibilities of consistency of measurement allowing comparison. 	<ul style="list-style-type: none"> Non-compliant 	
	C. PROCESS	6. OPENNESS	<ul style="list-style-type: none"> Accessibility of information and tools to all stakeholders. 	<ul style="list-style-type: none"> Partially compliant at district level and compliant at community level.
			<ul style="list-style-type: none"> Clarification of the basis for decisions, value judgments, assumptions, and uncertainties. 	<ul style="list-style-type: none"> Compliant
		7. EFFECTIVE COMMUNICATION	<ul style="list-style-type: none"> Address the needs of users and be designed to address the needs of the audience and set of users. 	<ul style="list-style-type: none"> Compliant
<ul style="list-style-type: none"> Have simple structure and language, avoid use of technical language. 			<ul style="list-style-type: none"> Compliant 	

	8. BROAD PARTICIPATION	<ul style="list-style-type: none"> Engage all key stakeholders including grass-roots, professional, technical and social groups in the decision making process. 	<ul style="list-style-type: none"> Since it was a people-centred grass roots emphasis, professional and technical people were not broadly consulted. This will require tasks for SA that combine a people-centred approach and expert approach.
D. ONGOING CAPACITY	9. ONGOING ASSESSMENT	<ul style="list-style-type: none"> Capacity for assessment repeated measurement to determine trends. 	<ul style="list-style-type: none"> Needs to be considered for future application of SA.
		<ul style="list-style-type: none"> Follow adaptive management to address complexities, changes and uncertainties. 	<ul style="list-style-type: none"> Compliant, also needs to be considered for future application of SA.
		<ul style="list-style-type: none"> Modification of framework components in line with new information and understanding. 	<ul style="list-style-type: none"> Needs to be considered for future application of SA.
		<ul style="list-style-type: none"> Collective learning mechanisms between stakeholders to strengthen decision-making. 	<ul style="list-style-type: none"> Compliant, needs to be incorporated for national level partners also.
	10. INSTITUTIONAL CAPACITY	<ul style="list-style-type: none"> Institution of accountability mechanisms and provision of appropriate support towards decision-making. 	<ul style="list-style-type: none"> Needs to be considered for future application of SA.
		<ul style="list-style-type: none"> Building of institutional capacity for collecting, updating and reporting data. 	<ul style="list-style-type: none"> Compliant at the local community level, also needs to be considered for future application of SA.
		<ul style="list-style-type: none"> Build capacity of local people to conduct assessment. 	<ul style="list-style-type: none"> Compliant

Source: Author's construction.

Table 7.3: Applicability of Gibson's sustainability-led decision criteria

Decision - Criteria	Principle	Description	Suggestions for application of SA in the MDTP
Socio - ecological system integrity	Establish relationships between human systems and ecosystems so that these remain intact in the long term to support both human and ecosystem well-being.	<p>Improve understanding of the complexities of the effects of human activities on ecosystems and their ecosystem services.</p> <p>Implement efforts to minimize both direct, indirect, cumulative, synergistic pressures on human systems and ecosystems for long-lived livelihoods.</p>	<p>MDTP has applied this principle by educating its partners at both district and community levels.</p> <p>These partners have drafted action plans to minimize pressures on ecosystems and human systems towards long-lived livelihoods.</p> <p>The remaining work is for general members of the community.</p>
Livelihood sufficiency and opportunity	Maintain and create opportunities for improved lives for individuals and communities without destroying chances of decent lives for future generations.	<p>Ascertain requirements for quality of life especially for the poor.</p> <p>Engage marginalized people when making decisions on how to meet their needs.</p>	<p>Emphasis of MDTP is to diversify the economy to help contribute to poverty alleviation in the communities.</p> <p>Marginalized people, such as women, youth and herd-boys have been brought on board to be part of decision-making structures. What is remains, is the inclusion of children.</p>
Intra-generational equity	Institute mechanisms that promote adequate meeting of needs without increasing the gap	Develop enduring and beneficial ways of life, choices, and the ability to choose, for everybody.	This fits the data handling tasks of the SA, thus was not addressed. To be considered for

	between the rich and the poor in terms of health, security, social recognition, political influence and related issues.	Promote meeting of needs in ways that consider needs of the poor and disadvantaged by using less materials and energy.	these tasks in future application of SA.
Inter-generational equity	Choose alternatives that promote protection and improvement of sustainable choices for future generations.	Use natural resources in ways that reduce detrimental effects on ecological systems so that they continue to provide services for future generations. Enhance and ensure enduring adaptation and changes in both socio-economic and ecological systems, through maintenance of diversity and effective governance measures, including participation and accountability.	Covers key aspects for consideration with regard to awareness-raising at all decision making levels.
Resource maintenance and efficiency	Institute ways to increase the resource base for long-lasting survival of both human systems and ecosystems by minimization of: resource exploitation, waste generation, material and energy use.	Find ways to be efficient so that economic growth can continue with reduced negative impacts on ecosystems. Establish intentions for the use of resources so that what is saved does not get used by the already rich.	Considered at the district level for design of action plans and also considered for awareness raising at the local community level.
Socio-ecological civility and democratic governance	Awareness creation and capacity building towards use of sustainability principles at all decision-making levels including individuals, the community, government, civil society and the private sector.	Establish governance structures to deal with complex socio-ecological systems. Increase mobilization of various stakeholders and processes towards sustainability and promote collective decision-making. Promote understanding of socio-	MDTP had created structures from bi-national to local levels and had mobilized members in these structures to act to achieve sustainability aspirations of biodiversity conservation. MDTP had also promoted

		ecological systems, stewardship for both human systems and ecosystems at all levels, from individuals to international bodies.	understanding and stewardship among partners. These initiatives need to be passed on to other members of the community as well.
Precaution and adaptation	Consider uncertainties, prevent risk taking in the absence of adequate knowledge to avoid irreversible damage to both socio-economic and ecological systems. Adopt reflective, adaptive and learning systems.	Use incomplete information carefully by: <ul style="list-style-type: none"> - planning for surprise and adaptation and promote diversity, flexibility and reversibility. - giving preference to environmentally safe technologies. - selecting options on the basis of broad information sources as opposed to certain knowledge areas. - having practical options and alternative plans; and implement effective monitoring. 	Adaptive, reflective learning systems advocated and promoted by the MDTP.
Immediate and long-term integration	Attain a number of positive benefits by using all the above sustainability principles together.	All sustainability aspects should move in a positive direction for beyond the short- and medium-term. Avoid tradeoffs except for cases where long term benefits will be realized.	Need to be considered for all sustainability issues of biodiversity conservation.

Source: Author's construction.

2.1.15 Key components of a sustainability assessment framework

Key components of the MDTP SAF depended largely on the tasks to be accomplished by SA. Based on the SAF tasks suggested by Tabara *et al.* (2007) and Rotmans (2006), five key components of the participatory SAF for biodiversity conservation include i) a vision for sustainability; ii) a generic process for conducting SA; iii) a toolkit; iv) an example application; v) and principles of SA. These key components also fit the main components of a SAF according to UNEP (2006). Gibson *et al.* (2005) distinguish a larger number of key components for a SAF. Components such as purposes, decision criteria, hierarchies and tiers, scope, and participation, are part of the MDTP SAF. Other components such as application rules, streams, evaluations, linkages beyond assessment and efficiencies were not part of the MDTP SAF. While these were not included in the participatory SAF, they are relevant for technical or expert-based approaches and need to be incorporated for data handling SAs and full SAs.

2.2 Effective incorporation of participation into a sustainability assessment process

The degree of participation varied according to the tasks to be served by SA for each stakeholder group, type of users and decision-making level. There was a higher degree of participation for direct users than for indirect users of the SA process. The SA process required that direct users be engaged at higher levels of participation, such as collaboration and empowerment. The role of participation was to give partners decision-making power with regard to various aspects of the SAF. The role of participation for the people-centred MDTP SA, differs from the role of participation for other EA tools, namely EIA and SEA. For EIA and SEA, the role of participation is to obtain concerns and key issues. The decision-making power remains with the environmental authorities. This is because EIA and SEA are predominantly expert-based approaches, with assessment procedures requiring external experts or consultants. There are

expert-based SA processes, which also need consultants and external experts. Conversely, a people-centred SA approach required capacity building of SA users at the local community level so that community members themselves could conduct the SA to self-assess or self-audit progress towards or away from sustainability.

The application of people-centred SA approaches poses greater challenges regarding the effective incorporation of participation. A study conducted by SAIEA (2003, 2004) revealed that the incorporation of participation in environmental decision-making was largely ineffective in the SADC region. The study focused mostly on participation within EIA processes, which are legally required in SADC countries, yet participation in these processes was found to be ineffective. The challenges regarding the ineffectiveness of participatory SA are even greater. This is because the adoption of a people-centred approach in SA requires a higher degree of participation, namely collaboration and empowerment. This level of participation is more demanding than that applied in EIA and SEA.

2.3 Ecosystem and human conditions required for sustainability of biodiversity conservation

2.3.1 Similarities of sustainability aspirations

There were few differences and remarkably more similarities regarding the sustainability aspirations mentioned by members of the DSCs from the three development nodes. The similarities can be attributed to the educational efforts of the MDTP within its established partnerships at district and community levels. Similar exposure to biodiversity issues caused partners to reach consensus on issues of sustainability and made the development of a comprehensive and shared vision for the sustainability of biodiversity, an easy

task. The minor differences were related to the requirements of the specific development nodes.

2.3.2 Alignment of sustainability objectives and application of trade-off rules

While all the sustainability objectives of all MDTP partners at national, district and local levels were aligned with the policy and legal requirements for biodiversity conservation at international to national levels, the aspirations of members of the general community in some cases conflicted with these. Also, sustainability concerns and issues raised by MDTP partners had the following characteristics: they were i) similar to those indicated by Mokuku (1999); ii) related to the MDTP objectives and strategies for biodiversity conservation; iii) associated with the requirements of policies at international level, such as the CBD, Ramsar, CITES as well as those at continental, regional and national levels. This indicates that participants agreed on and understood issues regarding the realization of the sustainability of biodiversity conservation in their area. Dalal-Clayton & Sadler (2004:14) reveal that an effective framework needs to be aligned with goals and indicators *“drawn from international law and policy, objectives of governments, the private sector or civil society”*.

Notably, there was only one issue where a conflict of interest between the aspirations of those at higher levels of decision-making and some community members, who were non-MDTP partners, was raised. The issue is related to wetland conservation. The perception of some communities was that wetlands should be removed and they said that *“these wetlands are useless, instead they are a nuisance, our livestock gets bogged down within them, they need to be filled and be converted into arable land.”* This statement is attributed to a lack of awareness regarding both the regional and local significance of wetlands.

MA (2005) indicates that there are usually conflicts between different decision-making levels regarding biodiversity. These conflicts need to be addressed through trade-off rules. Gibson *et al.* (2005) outline rules to be applied for making trade-offs between various aspects or dimensions of sustainability should conflict arise during the SA. These rules are applicable to the MDTP context.

2.3.3 Fragmented versus integrated approaches to sustainability issues

At strategic levels, the responses of decision-makers showed a largely fragmented approach to sustainability issues of biodiversity conservation. Policy makers mostly had a “silo mentality” which focused only on their respective mandates. Sustainability issues were addressed by focusing on the key pillars of economy, society and ecology separately. Conversely, the perceptions of MDTP partners at the district and community levels were largely holistic, revealing a mentality of integration, which considered aspects of both ecosystems and human well-being.

The adoption of a pillar representation for sustainability is preferred because pillars match traditional sustainability fields of expertise. Pillars are also easy to use when reporting sustainability information and categorizing indicators based on various fields of expertise (Gibson *et al.*, 2005; WRI *et al.*, 2005). On the other hand, pillars have disadvantages in SA processes because they promote the fragmentation of sustainability issues instead of integrating them. They fail to promote interconnections between ecosystem and human well-being, highlighting rival goals instead. They are also not effective in addressing conflicts between sustainability goals (Gibson *et al.*, 2005). According to Gibson *et al.* (2005), the limitations of the pillar approach can be mitigated by complementing the pillar mentality with sustainability principles. This is because sustainability principles help to identify fundamental changes for human well-being to make progress towards sustainability (Gibson *et al.*, 2005).

The application of an integrated approach is also emphasized by the ecosystem approach, advocated by the CBD and other conventions dealing with biodiversity. Consequently, there is a need to combine the “silo-mentality” with sustainability principles within SA processes. This is because the changing of mindset to apply a holistic approach will require time.

2.3.4 Emphasis on provisioning ecosystem services

Ecosystem and human dimensions that were selected were associated mostly with provisioning ecosystem services such as food, fodder, fuel, thatch grass, and medicines. In a study conducted on ecosystem services at the grassroots level, MA (2005) also found that community members emphasized provisioning services over other types of services. Being rural, community members depend on subsistence agriculture (both crops and livestock) but production levels are perceived to be declining and food security is threatened. Also, the MDTP area has few business opportunities or employment options hence economic diversification is required to address the situation.

Community members who were not MDTP partners understood the relevance of biodiversity when the ecosystem services concept promoted by MA (2005) was used. This is because the use of this concept clarifies the benefits of biodiversity. This conceptualization of biodiversity needs therefore to be promoted so that decision-makers can understand how their lives are related to ecosystems and so take actions towards sustaining biodiversity.

2.4 Stakeholder perceptions of progress towards sustainability

2.4.1 Overall scores regarding progress towards sustainability

All three components of the CSA were not making good progress towards sustainability. This is in line with the comment by Gibson *et al.* (2005) that, in spite of several decades of promoting the sustainability agenda, progress towards sustainability is lagging behind in many areas, especially in developing countries. Furthermore, the results are similar to the findings of the Well-being of Nations Assessment (Prescott-Allen, 2001), where a combined assessment of human system and ecosystem well-being revealed that all countries, worldwide are not getting closer to sustainability. The results of the CSA indicate that Lesotho is faced with challenges in meeting the MDG targets for sanitation, as well as the 2010 biodiversity targets, in its rural areas.

2.4.2 Disparities between ecosystem versus human well-being results

Progress towards the sustainability of ecosystem well-being is lower when compared to human well-being. This indicates that the realization of human well-being in the MDTP rural areas occurs at the expense of ecosystem well-being. This condition poses threats for the long-term sustainability of biodiversity. The escalation of the degradation of biodiversity is not only a problem for the MDTP rural areas. It is a worldwide challenge as pointed out by UNDP *et al.* (2000; 2003), MA (2005) and WRI *et al.* (2005). In Asia, Shi *et al.* (2004) also found that when socio-economic development is pursued at the expense of ecosystem well-being, it is detrimental to the environment. They indicated that for socio-economic development and ecosystem well-being to be pursued simultaneously, protective measures need to be instituted to sustain both human and ecosystem well-being. The pursuit of both ecosystem and human well-being in the MDTP area is crucial because rural inhabitants depend more on biodiversity and the ecosystem services it provides. Furthermore,

findings in earlier sections reveal that SA participants at the district level, prioritized ecosystem dimensions on the basis of the provisioning services they provide. Therefore, to sustain these ecosystems in the long term requires that actions be undertaken to realize sustainability for both the human and ecosystem aspects. Also, Gibson *et al.* (2005) assert that sustainability mandates that positive gains should be realized for both ecosystem and human well-being simultaneously.

2.4.3 Differences in sustainability scores between development nodes

The overall scores for Qacha's Nek were slightly higher than for the other two development nodes as were the scores for the socio-ecological, socio-cultural and spiritual components. This implies that conditions conducive to the sustainability of biodiversity conservation are better for Qacha's Nek than the other two development nodes. While Mokhotlong and Qacha's Nek are both located in the mountain eco-region of Lesotho, the results reveal that their state of sustainability differs. Instead, results from Mokhotlong were similar to those from Butha Buthe, which is located in the lowlands.

The higher scores for Qacha's Nek can be attributed to a biodiversity conservation project, which was implemented and completed just before the MDTP commenced. This project covered districts in the southern parts of Lesotho, which included Qacha's Nek, Quthing and Mohale'shoek. The project was called Conserving Mountain Biological Diversity in Southern Lesotho (CMBSL) and sensitized community members to biodiversity conservation issues as well as related socio-economic issues. Thus the scores for issues regarding sustainability, in particular ecosystem well-being, were relatively higher for Qacha's Nek than for the other two development nodes.

From the discussion of findings, several lessons were learned. These are presented in the following section.

3 KEY POINTS ON LESSONS LEARNED

The lessons learned while applying SA within the MDTP case study are presented in four sections:

- Main components of a participatory sustainability assessment framework;
- Stakeholder participation in sustainability assessment;
- Issues that need to be addressed to realize the sustainability of biodiversity conservation in the MDTP; and
- Conditions of sustainability in the MDTP area.

3.1 Lessons learned regarding the main components of a participatory sustainability assessment framework

The type of components for a participatory SAF depend on whether an SA is a partial or full SA. Components for partial SAF also depend on whether the focus is on reflection and learning, or data handling. The main components of a participatory SAF that focuses on reflection and learning include:

- A comprehensive vision of sustainable development;
- Goals towards attaining this vision;
- A participatory process engaging various stakeholders;
- A toolkit of appropriate SA tools used for various tasks;
- Relevant principles of sustainability assessment; and
- Sustainability-led decision criteria.

The features of these components are determined largely by the results of the participatory process, thus the components related to participation in SA are discussed next.

3.2 Lessons learned about stakeholder participation in sustainability assessment

- The integration of participation into the application of SA requires inputs and consultations with participants on how the participatory process should be conducted.
- Participants need to be consulted about the types of participatory techniques that they believe are best suited to their needs and resources.
- Traditional ways of engagement, such as pitso's, need to be supplemented with other techniques to ensure effectiveness.
- Each level of stakeholders has different participation requirements depending on the task of the SA and their roles and responsibilities.
- The degree of participation increases from higher decision-making levels to lower levels, if the purpose of the SA is to raise awareness through community level partners.
- Participation needs to be tailored to the time frame, resources and purpose of SA at each decision-making level.
- By using a participatory approach, participants are able to learn and reflect on issues that affect them.
- A participatory approach runs more smoothly and quickly if partnerships have been developed and have been working for sometime.
- A participatory approach fosters closeness of relationships, builds a sense of trust and belonging among stakeholders and can enhance collaboration among implementing partners of biodiversity conservation interventions.
- The results of a participatory SA process can be used to complement data handling and expert-based SA approaches.
- Effective participation within a SA requires that participants be knowledgeable about the sector or theme under assessment.

- Capacity building and relevant institutions are required for using self-assessment SA tools that can be applied by stakeholders themselves without the assistance of external facilitators.
- Participatory approaches can also be used by community members themselves with or without the help of external facilitators.
- Encouraging participants to own the SA process from the beginning gives more freedom of expression and information than when the facilitator runs the process.
- Effective participation requires those institutions committed to using the results of the assessment to be engaged in the process.
- Direct users of the results require higher degrees of participation than indirect users.
- Recognition of language, culture and protocol makes a participatory approach more user-friendly.
- A user-focused process requires users to determine the purpose of and need for participation.
- Participation within SA beyond the lifetime of the project requires arrangements for the sourcing of funds during the project lifetime.
- Participatory SA is more cost-effective especially in poor developing areas when it complements existing processes and activities and is not conducted as a standalone process.
- There is no blueprint on how to conduct participation in SA, hence, adaptability and flexibility are required in specific circumstances.
- A grasp of participatory rural appraisal techniques and facilitation expertise are required to undertake participatory SA effectively.
- Other important issues for consideration among the key lessons for effective participation include:
 - Empowering local structures and relevant government departments as, unlike project staff, they are not temporary staff.

- Obtaining professional support and combining technical knowledge with local knowledge.
- Obtaining commitment to partnerships and the process of SA.
- Providing opportunities for learning about biodiversity conservation based on SA results. This requires the creation of mechanisms for information sharing and networking between SA users from different development nodes.
- Dissemination of SA findings for awareness raising and sensitization.
- Provision of incentives for participation because community members do not regard biodiversity conservation activities as priorities as the benefits are not immediate.

3.3 Lessons learned about issues that need to be addressed to realize the sustainability of biodiversity conservation in the Maloti Drakensberg Transfrontier Project area

- Identify opportunities for appropriate point of entry for the application of SA by finding ways of using either integrated planning or EA processes such as SEA and EIA.
- Identify values and preferences regarding what needs to be sustained by stakeholders at each decision-making level so that conflicts of interest can be recognized and addressed.
- Complement the pillar based approach to sustainability with SA principles, to avoid the disadvantages of a fragmented silo mentality when undertaking SA.
- Raise awareness and carry out relevant environmental education regarding the implications of existing practices related to biodiversity conservation. This is crucial for changing perceptions of implementing partners and makes the visioning process easier and smoother.

- Using the ecosystem services conceptualization of biodiversity results in decision-makers better understanding their responsibilities towards biodiversity conservation.
- Phasing of SA tasks based on priorities and the availability of funds is crucial to save limited resources and to allow participants to recognize the relevance and benefits of the SA process to their ongoing activities and processes.
- Addressing issues of ecosystem and human well-being together helps to identify interconnection and fosters commitment regarding the stewardship of biodiversity conservation among partners. Partners are able to comprehend the symbiotic relationships between ecosystems and humans when these are addressed together in the SA process.
- Sustainability assessment tools from other places need to be tested before application and be refined to suit the biodiversity conservation circumstances in question.

3.4 Perceptions of conditions of sustainability in the Maloti Drakensberg Transfrontier Project area

The MDTP partners were knowledgeable about conditions of sustainability and threats to biodiversity in the area. On the other hand, general members of the community were not aware of these issues. The following lessons are extracted from the MDTP case study:

- Perceptions of conditions of sustainability are largely based on the level of awareness.
- Collaborative partnerships between the MDTP members of the DSCs and CCFs have made the perceptions of these people differ strikingly from those of the rest of the community.
- Ecosystem well-being is perceived to be worse than human well-being and requires more attention during awareness raising efforts.

- The perceptions of members are remarkably similar across the development nodes indicating that there is agreement about what needs to be collaboratively achieved.

Having highlighted the key points of lessons learned, the following section analyses these lessons in terms of strengths, weaknesses, opportunities and threats in applying a participatory SAF for biodiversity conservation in rural areas.

4 STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS IN APPLYING SUSTAINABILITY ASSESSMENT FOR BIODIVERSITY CONSERVATION IN RURAL AREAS

This section provides an analysis of issues that were discovered during the application of a SA in the MDTP. These issues can help to guide the design and application of SA for biodiversity conservation in rural areas and are classified according to strengths (4.1), weaknesses (4.2), opportunities (4.3) and threats (4.4).

4.1 Strengths

- The existence of partnerships within multiple-stakeholder forums at bi-national, national, district and local levels provide a beneficial platform to launch and apply SA as well as undertaking a shared visioning process for sustainability;
- Smooth working relationships exist between partners at bi-national, national, district and local levels;
- Through the educational efforts of the MDTP, its partners (SA users and participants) have knowledge at the district and community level regarding threats to sustainability as well as of the international, continental, regional and national policy and regulatory framework on biodiversity.

- Commitment of MDTP staff to undertake SA, collaborate with its partners in the process and also to empower community level partners in the use of a suitable SA tool;
- Parallel and ongoing activities that require SA at national, district and community levels;
- Lessons gained by MDTP partners from experience of previous biodiversity conservation projects;
- Involvement of traditionally marginalized groups such as women, youth and herd-boys within the multiple-stakeholder structures created by MDTP;
- Emphasis on active community participation when implementing strategies of the MDTP;
- Lessons from previous projects and biodiversity conservation initiatives regarding the causes of non-sustainability;
- Adoption of a holistic and integrated approach towards biodiversity conservation by MDTP.

4.2 Weaknesses

- Long distances that partners at the district level have to travel making transport a challenge, especially beyond the lifetime of the MDTP as there will no longer be funding for transport;
- Lack of finances to undertake SA beyond the lifetime of the project; money is required for resources such as communication, transport, hall rental and subsistence during meetings;
- Prevailing poverty that makes partners more interested in other activities that give them immediate cash to meet daily needs within households. Participation in biodiversity conservation work does not offer immediate benefits;

- Poor facilitation skills to undertake the SA at district level because members of the DSCs were not trained in the use of the IUCN SA tool. Facilitation was undertaken by an external agency;
- Lack of continual capacity building with regard to other tools that can be used for SA and other tasks for which SA can be applied, leading to a lack of skills among partners of the MDTP at the district and community level, to engage effectively at higher levels of participation such as collaboration and empowerment;
- Poor support from government to fund full SA because of lack of awareness concerning the significance of SA in promoting the sustainability of biodiversity conservation interventions;
- Lack of awareness by members of the general community regarding threats to sustainability as well as the international, continental, regional and national policy and regulatory framework that affects biodiversity conservation at community levels;
- Lack of awareness at community level regarding the significance of biodiversity and ecosystem services on which their livelihoods depend on a daily basis;
- Lack of awareness by members of the general community regarding the condition and trends of the natural resources they depend on to secure their livelihoods;
- Lack of legal instruments and institutions for managing biodiversity;
- Lack of communication of research results regarding biodiversity conservation to community members;
- Traditionally poor horizontal participation between various decision-making levels from the national to local levels.

4.3 Opportunities

- The availability of tools that can be tested and applied for various tasks of SA;

- Insights from the application of various SA approaches in both developed and developing countries;
- Saving of costs by using self-assessment SA tools thus obviating the need for external experts;
- International organisations and development agencies are currently focusing on the development and application of SA in developing countries.
- Emphasis on and promotion of the use of integrated and holistic assessment approaches internationally to realize aspirations towards sustainable development;
- Recognized benefits of using participatory approaches even within international law such as the Rio principles and Agenda 21;
- The acknowledged significance of biodiversity and ecosystems services within international circles;.
- Recognition of the importance of using EA approaches to ensure the sustainability of biodiversity by key international instruments dealing with biodiversity, such as the CBD;
- Newly developed decentralized structures for local government through which SA can be conducted;
- Flexibility of using SA alongside other processes to complement and inform thus enriching the outcome for both SA and the other processes;
- Lessons from effective EA processes within EIA and SEA that can be used to guide the development of effective SA processes;
- Use of the ecosystem services concept to make biodiversity relevant and understandable to decision-makers at all levels.

4.4 Threats

- A traditionally fragmented approach used by various government departments towards conservation in general in Lesotho;

- Proliferation of sustainability assessment approaches that might undermine more than three decades of work towards placing the environmental dimension on a par with the economic dimension in development decision-making. Compromises might be made in favor of the economy that could be detrimental to the environment;
- The overloading and slowing down of the decision-making processes due to the proliferation of complicated sustainability assessment approaches;
- Although the policies and legal requirements of most countries and development agencies mandate the use of EIA, few jurisdictions have authorized SEA either as a policy or a legal requirement. Therefore, at the strategic level, sustainability decision-making and planning is not common, but is in its formative stages in most cases.
- There is no quality control of the approaches to sustainability assessment. There is also a lack of scientific rigor in some of the approaches. Moreover, there is a lack of consensus and guidance regarding the standards for the utilization of approaches to effective sustainability decision-making;
- Non-existent human and financial capacity or appropriate institutions to conduct sustainability assessments, especially in developing countries;
- Uncertainties regarding the impact of various sustainability assessment processes on decision-making.

The discussion of the findings of the MDTP case study reveals insights into lessons learned, strengths, weaknesses, opportunities and threats in applying a participatory SAF for biodiversity conservation in rural areas. Guidelines on how this should be applied effectively are presented in the following section.

5 GUIDELINES FOR A PARTICIPATORY SUSTAINABILITY ASSESSMENT FRAMEWORK FOR BIODIVERSITY CONSERVATION IN RURAL AREAS

5.1 Guidelines for designing an effective and participatory sustainability assessment framework for biodiversity conservation in rural areas

The following guidelines need to be considered in the identification and incorporation of significant components for an effective and participatory assessment.

- Incorporate, and build on, the lessons in the effective application of EA;
- Be aware of the weaknesses that SA approaches have inherited from the EA field and find ways to minimize them;
- Consider ways of extracting lessons from various SA approaches to create a framework that fits the situation;
- Be careful that the promotion of integration does not compromise the integrity of ecosystems ;
- Identify the most appropriate entry point for SA in either EA processes, such as EIA and SEA, or integrated planning;
- Identify ongoing and past activities that can be complemented by SA, and ensure that SA is not undertaken as a standalone process, as this will ensure that the application of SA is cost-effective;
- Determine a context specific meaning of sustainability, what needs to be sustained, why some aspects need to be sustained and for whom they should be sustained.
- Consider ways of having a framework that is flexible so that it addresses issues retrospectively as well as prospectively.

- Develop a clear conceptual framework, which determines priorities so that information is organized and presented in a manner that serves the users and participants of the SA.
- Clarify the main functions of the framework and determine its parts and aims in a participatory manner.
- Identify relevant principles to be adhered to at each stage of the SA process. Also identify principles that need to be adopted to move towards sustainability.

5.2 Guidelines for the effective incorporation of participation within sustainability assessment for biodiversity conservation in rural areas

In incorporating participation effectively when undertaking SA, one needs to consider:

- The strengths, weaknesses, opportunities and threats of participation within the EA field should be understood to build on successes and avoid pitfalls.
- Clear goals to be achieved by the participatory approach should be established and agreed on by those who need the SA.
- Partnerships should be established and be operational prior to the application of SA so that stakeholders build trust and agree on issues before the collaborative drawing of a shared vision for sustainability.
- Facilitators of the participatory process should be conversant with the type of participatory techniques required for each SA task, the resources available, the SA user and key stakeholders.
- Discuss and decide on the preferred process and stages of participation in partnership with participants and users of the SA results. This allows participants to define the effectiveness of participation in their own way so that external facilitators do not impose the process on them.
- Participatory SA practitioners or facilitators need to play an advisory role and not the “know-it-all-expert”. This allows participants to relax

and engage freely without fearing that an “expert” is judging their contributions. The participants of the SA process are thus given a platform from which to be the experts with their own aspirations that suit their circumstances.

- Sensitize and raise awareness between different decision-making levels to identify conflicts and consider trade-offs.
- Organize opportunities for learning and reflection within and between decision-making levels, thus allowing for both vertical and horizontal participation.
- Arrange for prior education on biodiversity conservation benefits, threats and potential solutions.
- Establish roles and responsibilities through consultation with participants regarding their need for SA.
- Ensure that the drivers of the process have good facilitation and conflict management skills.
- Prepare adequately prior to undertaking SA to identify the most suitable SA tools and processes for the task at hand.
- Consult and learn about previous and ongoing activities that will affect stakeholder participation and obtain input for designing a participatory process for SA.
- Consult and learn about language preferences as well as the cultural protocols of the area to make the process run smoothly. Allow participants within the SA process to choose the language during discussions. Translate materials and tools and engage facilitators who speak the local language to suit the language preferences of community members.
- Train facilitators and research assistants thoroughly and adequately regarding the SA process so that they can undertake SA tasks confidently and competently.

- Allow the process to run at a pace preferred by the participants, not allowing the process to be rushed or slowed down to suit the facilitators.
- Tailor the level of participation to available resources such as time, staff and money and discuss this with participants at all decision-making levels before commencing with the SA process.
- Allow for flexibility and adaptation throughout the process to accommodate the unexpected.
- Consult regarding the preferred traditional techniques for participation and establish if it will meet with the requirements for SA. Find ways to strengthen traditional participatory techniques by incorporating other participatory techniques to attain the level of participation required for the SA task. Explain the reasons for modifications of the traditional participatory techniques to participants beforehand.
- Build capacity for applying SA in a participatory manner, at different levels and in different ways, as per the task to be served by SA for specific SA users or participants, to allow for the continuity of assessment after the facilitators finish their assignment.
- Present options for participation and relevant SA tools, their advantages and disadvantages and allow users to select the tools they prefer.
- In consultation with users and participants of the SA, explore ways of sustaining participation locally as well as the use of SA beyond the lifetime of the project, if SA is to be applied within the project.
- Identify potential threats to the application of SA and ways of managing these threats both during and beyond the lifetime of the project.

5 SUGGESTIONS FOR FUTURE RESEARCH

This study explored the creation and application of a participatory sustainability assessment for rural areas in Lesotho. It revealed insights related to developing an SAF for biodiversity conservation initiatives. Since the

creation and application of SAFs in developing countries is a relatively new field, a huge opportunity exists for further research to enhance the theory and practice of SA.

This thesis focused on the creation and application of an SAF during the beginning to middle years of a biodiversity conservation project, i.e. the MDTP. The emphasis was on the integrated planning of biodiversity conservation interventions. Insights are required on how the application of a participatory SAF contributed to the sustainability of biodiversity conservation initiatives during the later years and beyond the lifetime of the MDTP. The thesis was also devoted to effectively incorporating participation within an SAF and did not focus on data handling. Thus another area to be explored is the application of a participatory SA in a full SA, as well as in a SA focused on data handling only. In addition, another area for research is how the results of a participatory SA could contribute to an expert-based SA.

The emphasis of this thesis was on the biodiversity sector. A study of the applicability and relevance of SA to other sectors such as mining, water and forestry, in developing countries is also required to compare similarities and disparities. The study also focused on rural areas and not on urban areas. This reveals an opportunity for a similar study of urban areas in developing countries. Furthermore, the types of tools that were tested, modified and applied for the SA, focused on the participation of stakeholders. Testing the applicability of other tools relevant to data handling could also be explored.

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APPENDICES

APPENDIX 1

**Main tasks, substantive and process components, strengths and weaknesses
of selected sustainability assessment frameworks**

Main tasks, substantive and process components of selected SA tools

NAME	MAIN TASK (S)	SUBSTANTIVE COMPONENTS	PROCESS COMPONENTS
<i>Multiple level</i>			
Common Assessment Framework	<ul style="list-style-type: none"> Design of process underlying sustainable development for effective and quality sustainability assessment approaches. 	<ul style="list-style-type: none"> Aligned with EIA and SEA with three main components: the planning context for SA; the process for undertaking the assessment and using the findings; the technical and consultative methods for assessing impacts. 	<ul style="list-style-type: none"> Combination of people-centred and technical approaches.
Gibson Framework	<ul style="list-style-type: none"> Inform the design of process underlying sustainable development for effective sustainability assessment substance and processes. 	<ul style="list-style-type: none"> Decision criteria for sustainability assessment SA trade-off rules Purposes Application rules Hierarchies and tiers Streams Scope Participation Evaluations Linkages beyond assessment and efficiencies 	<ul style="list-style-type: none"> Suggests requirements for sustainability assessment law. Effective processes need to be enforced by law.
<i>Sector-specific</i>			
Revised framework for integrating ecological, social and financial factors into business decision	<ul style="list-style-type: none"> Design of process underlying sustainable development to guide the business sector on integrating sustainability factors into 	<ul style="list-style-type: none"> Hierarchical arrangement of principles, strategies, actions, criteria and tools. 	<ul style="list-style-type: none"> Hierarchical process entailing system definition; identification of outcomes, strategy design, action planning and creation of tool- kit.

NAME	MAIN TASK (S)	SUBSTANTIVE COMPONENTS	PROCESS COMPONENTS
making	decision making.		
Mining Minerals and Sustainable Development Project	<ul style="list-style-type: none"> Appraise sustainability impacts of mining and minerals projects. 	<ul style="list-style-type: none"> Multi-scale approach Fits within broader framework Addresses sustainability issues beyond legislation requirements. 	<ul style="list-style-type: none"> Early consultation with relevant community to identify local concerns. Dynamic, inclusive and ongoing knowledge interaction.
Forest Stewardship Council	<ul style="list-style-type: none"> Appraising sustainability impact of forestry operations and wood products. 	<ul style="list-style-type: none"> Principles Criteria Standards specified for jurisdictions and forest types Local level objectives and indicators. 	<ul style="list-style-type: none"> Multi-stakeholder body uses transparent and consultative process with peer review and follow-up audits.
Equator principles	<ul style="list-style-type: none"> Assessing sustainability impact of project financing. 	<ul style="list-style-type: none"> Principles 	<ul style="list-style-type: none"> Participation of affected parties included.
Sustainability assessment framework for irrigation water management in irrigation dominated river basins in Central Asia	<ul style="list-style-type: none"> An analytical modeling framework for managing river basins used for irrigation. 	<ul style="list-style-type: none"> Deals with integration of issues related to agronomy, economy and hydrology. 	<ul style="list-style-type: none"> Participation biased towards relevant disciplines not general stakeholders.
Framework for utilization and learning using sustainability indicator systems and policy processes in Malaysia	<ul style="list-style-type: none"> Policy learning for change and sustainability. 	<ul style="list-style-type: none"> Four types of policy learning: instrumental, governmental, social and political. Three elements of the learning process: who learns, what they learn and what results from learning. 	<ul style="list-style-type: none"> Participatory, but limited to the policy level.
Strategic environmental assessment for sustainability appraisal of Ghana's poverty reduction strategy	<ul style="list-style-type: none"> Concurrent two level strategic EIA process with on emphasis on linkages between poverty and the environment. 	<ul style="list-style-type: none"> Deals with sustainability issues across multiple scales, especially national and district levels. 	<ul style="list-style-type: none"> Capacity building for stakeholders. A technical and participatory process entailing: understanding context, determining objectives and targets, defining

NAME	MAIN TASK (S)	SUBSTANTIVE COMPONENTS	PROCESS COMPONENTS
			baseline conditions, evaluating existing policy/program/plan, developing indicators, and considering alternatives.
Sustainable development assessment conducted in Ethiopia by the University of Berne	<ul style="list-style-type: none"> • Identification of information on ecosystems and human well being leading to identification of areas for sustainable development. 	<ul style="list-style-type: none"> • A trans-disciplinary approach on detailed assessment of a national park (Simen Mountains) and 30 villages around the park. 	<ul style="list-style-type: none"> • Development of different stakeholder visions of sustainable development and identification of felt needs for improving their livelihoods and fulfilling development tasks.
Integrated Environmental Management (IEM) and the National Environmental Management Act (NEMA) 1998.	<ul style="list-style-type: none"> • Broad definition of environment covering all key aspects. 	<ul style="list-style-type: none"> • Provide a comprehensive definition of the term environment and principles that guide the sustainability assessment processes. 	<ul style="list-style-type: none"> • Effectiveness of stakeholder participation encouraged.
Integrated Development Plans	<ul style="list-style-type: none"> • Application of an integrated approach which combines technical issues with community-based issue analysis. 	<ul style="list-style-type: none"> • Use of several tools such as sustainability indicators, stakeholder workshops, participation structures and processes. 	<ul style="list-style-type: none"> • Extensive participation of all relevant stakeholders. Includes a capacity building component for effective participation of communities.
Cape Action Plan for the Environment (CAPE) strategy	<ul style="list-style-type: none"> • Participatory development of a strategy for biodiversity conservation. 	<ul style="list-style-type: none"> • Combination of technical and participatory aspects in the development of the strategy. 	<ul style="list-style-type: none"> • Six participatory steps: development of a common vision, development of a goal, identification of obstacles, conversion of obstacles into intermediate objectives, development of a strategy map and conversion of the map into strategy.
Development of sustainability indicators for catchment management systems	<ul style="list-style-type: none"> • A framework for arrangement of timely and adequate information for water resources 	<ul style="list-style-type: none"> • Development and identification of suitable indicators for catchment management systems. 	<ul style="list-style-type: none"> • Indicator identification was participatory but focused on the water sector.

NAME	MAIN TASK (S)	SUBSTANTIVE COMPONENTS	PROCESS COMPONENTS
	management in South Africa.		
<i>Location specific or Single level tools</i>			
Regional or state/national			
Solution Spaces for Decision Making (SSP)	<ul style="list-style-type: none"> Expand tools such as EIA, SEA and IA through a multi-dimensional tool to manage city regions for economic growth, social cohesion and environmental improvement. 	<ul style="list-style-type: none"> Normative, systemic and procedural dimensions. 	<ul style="list-style-type: none"> Trans-disciplinary consisting of participatory for affected people such as citizens and expert approach for researchers, academics and various professionals.
Western Australia Sustainability Strategy	<ul style="list-style-type: none"> Designed to fit within broader framework of sustainability governance 	<ul style="list-style-type: none"> Criteria Trade offs 	<ul style="list-style-type: none"> Participation
Sustainability appraisal of regional spatial strategies and local development plans for the United Kingdom.	<ul style="list-style-type: none"> Guide performance reviews of existing and proposed policies, plans, activities and plans. 	<ul style="list-style-type: none"> Sustainability principles Criteria Selection of objectives on the basis of relevant regulatory and policy framework Indicators Key stages for sustainability assessment process. 	<ul style="list-style-type: none"> Five stage process allowing stakeholder participation during some of the tasks in the sustainability assessment process.
Systemic and Prospective Sustainability Analysis	<ul style="list-style-type: none"> Analyzing dynamics of SD, forecasting sustainability trends, assessing sustainability impact of project options and interventions, monitoring long term process of SD. 	<ul style="list-style-type: none"> Development of sustainability indicators in a participatory manner. Cyclical approach that allows reflection and learning. 	<ul style="list-style-type: none"> 12 stage process dealing with all stages of the learning cycle, reviewing past experience, planning and modeling for the present, looking to develop and change on the basis of what is learned.
Integrated Sustainable Cities Assessment Method	<ul style="list-style-type: none"> Integrated complex systems framework for urban and regional planning to examine 	<ul style="list-style-type: none"> Recognition of feedback and linkages between global, national, and local. Contribution to 	<ul style="list-style-type: none"> Technically oriented for deliberation of complex relationships.

NAME	MAIN TASK (S)	SUBSTANTIVE COMPONENTS	PROCESS COMPONENTS
	trends, targets and alternative scenarios.	larger initiatives. • Monitoring and evaluation.	
Assessing Sustainability of Societal Initiatives and Proposing Agenda for Change	• For review of proposed initiatives.	• Environmental, social and cultural, economic, planning and design considerations. • Principles • Objectives	• Two stages of sustainability assessment process with initial screening and more detailed examination.
Hong Kong Sustainability Assessment system for integrated consideration of proposals (Gibson <i>et al.</i> , 2005:228)	• Checklist-based system for preliminary reviewing of major strategic initiatives and programs.	• Eight guiding principles. • A set of forty-two indicators. • Process steps for various activities such as setting of proposal objectives and assumptions, evaluation of positive and negative implications using a checklist and consideration of alternatives. •	• Involvement of community groups and non-governmental organizations (NGOs). Community participation accompanied by institutional development, capacity building and funding.
<i>Community or neighborhood or village</i>			
Global Eco-village Network	• Assessment of progress towards sustainability within individual communities.	• 148 questions organized under three categories. • Each of the three categories having seven themes.	• Participatory approach for community level. • Reflection and learning as well as awareness-raising on sustainability issues at the community level. • Self-assessment by community members possible.
Local Agenda 21 campaign by the International Council for Environmental Initiatives	• Participatory planning process for communities applied in more than 6 000 cities world-wide.	• Sustainability audit • Sustainable community vision • Action plan with roles targets, responsibilities, funding sources and work activities. • Community based monitoring and evaluation using locally appropriate	• Multi-stakeholder group consisting of representatives from all sectors of the community.

NAME	MAIN TASK (S)	SUBSTANTIVE COMPONENTS	PROCESS COMPONENTS
		<p>indicators.</p> <ul style="list-style-type: none"> • Reporting and controlling mechanisms. • Linking local to global dimension. • Adoption of LA21 by city council. 	
Strengthening rural areas approach	<ul style="list-style-type: none"> • For use by local organizations and groups to investigate community sustainability. 	<ul style="list-style-type: none"> • Role of government for capacity building. • Characteristics of sustainable communities and indicators of sustainability. • Social capital and rural communities. 	<ul style="list-style-type: none"> • Participatory approach that can be administered by communities themselves.
Australian local sustainability initiative	<ul style="list-style-type: none"> • Assessment of progress towards sustainable development. 	<ul style="list-style-type: none"> • Achievement recognition matrix. 	<ul style="list-style-type: none"> • Participatory approach for local government purposes.
A systems approach for the development of a sustainable community using the sensitivity model for Ping Pong community in Taiwan (Chan & Huang, 2004)	<ul style="list-style-type: none"> • Addressing conflicts between conservation and development of local tourism. 	<ul style="list-style-type: none"> • Systems thinking tool called sensitivity model to plan community sustainability. 	<ul style="list-style-type: none"> • Technical approach allowing stakeholder participation at several stages of the process. All stakeholders involved extensively for identification of issues, variables and priorities. • Stakeholders engaged in a culture of learning. • Participatory process found to be time consuming.
An integrated approach for evaluation of coastal zone sustainability in Shanghai Municipality and Chong Ming Island, China (Shi <i>et al.</i> , 2004)	<ul style="list-style-type: none"> • Investigation of sustainability in the coastal area. 	<ul style="list-style-type: none"> • Application of suitable indicators categorized according to the three pillars of sustainability: environment and resources, economic development and society. 	<ul style="list-style-type: none"> • Relevant stakeholders from government, non-governmental organization and communities.

Summary of strengths and weaknesses of selected SA tools

NAME	STRENGTHS	WEAKNESSES
<i>Multiple level</i>		
Common Assessment Framework	<ul style="list-style-type: none"> Combining of participatory and technical SA processes. Complementary role of participatory SA approach to technical and expert based SA processes. Technical processes aligned with EIA and SEA that inform how EIA or SEA can be entry points for SA application. 	<ul style="list-style-type: none"> More appropriate for higher levels of governance. Designed to suit strategic SA processes not existing activities. Cannot be applied by communities themselves.
Gibson Framework	<ul style="list-style-type: none"> Very informative since it is comprehensive. Distinguishes key components for various SA purposes that inform the SA framework. Gives emphasis also on the significance of participation within SA processes. 	<ul style="list-style-type: none"> Generic and needs to be tailor-made for the SA situation at hand so that key components are considered and applied in the context of biodiversity conservation in rural areas.
<i>Sector specific</i>		
Sustainability assessment framework for business decision making	<ul style="list-style-type: none"> Integration of ecological, social and financial factors into businesses such as planned ecotourism enterprises in the MDTP area. Hierarchical framework allowing nested decision making. Organization of various SA tools according to and based on their complementary roles and relationships. 	<ul style="list-style-type: none"> Not for community level application on reflection and learning. Specifically for business and not other sustainability issues. Largely technical requiring relevant expertise and not people centred.
Mining Minerals and Sustainable Development Project	<ul style="list-style-type: none"> Multi-level approach; guidance on how to integrate and complement EIA requirements with other assessments; an inclusive, dynamic, ongoing process that is agreed and authorized by stakeholders; goes beyond legislation requirements; existence of impact monitoring connected to community sustainable development plan. 	<ul style="list-style-type: none"> Designed for proposed projects not existing activities; focus of participation is consultation and not empowerment; approach is not self-administered by stakeholders but by outsiders.
Forest Stewardship Council	<ul style="list-style-type: none"> Stakeholder representation of the three pillars of sustainability; setting of principles and criteria by stakeholders; adoption of a participatory process that is transparent when setting standards; educational efforts on 	<ul style="list-style-type: none"> Designed specifically for forests in tropical and temperate regions and not for biodiversity in rural areas.

NAME	STRENGTHS	WEAKNESSES
	how to use and maintain resources efficiently.	
Equator principles	<ul style="list-style-type: none"> Requirements for financial institutions to include socio-ecological issues alongside economic ones; stakeholder participation in the design, review and implementation of projects. 	<ul style="list-style-type: none"> Principles only, does not have other components; technical approach applied by consultants and communities themselves; participation type is consultative and not empowerment.
The Aral Sea sustainability assessment framework for irrigation water management in irrigation dominated river basins in Central Asia	<ul style="list-style-type: none"> Deals with the sustainability of water ecosystems, especially wetlands. This issue is one of the main concerns in the rural mountains of Lesotho. The importance of these water ecosystems transcends their local use and provides much needed water for the Southern African region. Lesotho is an upstream riparian country of the Orange River Basin alongside South Africa and Namibia. It is therefore important that the long-term productivity of wetlands is ensured for economic development in the Orange River Basin. 	<ul style="list-style-type: none"> The focus for biodiversity conservation in this approach deals with conservation of water ecosystems and maintenance of their capacity to support agriculture. It is a technical approach that requires expert application. It concentrates on biophysical and economic issues and does not pay attention to social issues. The type of participation it allows is not community empowerment as required by the MDTP.
Framework for utilization and learning using sustainability indicator systems and policy processes in Malaysia	<ul style="list-style-type: none"> Reveals lessons for various requirements of sustainability learning for policy processes. 	<ul style="list-style-type: none"> Focused only on policy learning and does not address components required for SA application. Deals with policy processes and not existing practices at the community level.
Strategic environmental assessment for sustainability appraisal of Ghana's poverty reduction strategy	<ul style="list-style-type: none"> Deals with SA issues at national and district levels 	<ul style="list-style-type: none"> Technical tool that requires external expertise and cannot be self-administered by communities themselves. Does not deal with the local community level.
Sustainability Assessment conducted by the University of Berne	<ul style="list-style-type: none"> Focuses on natural resources including biodiversity. Development of diverse stakeholder visions of sustainability. 	<ul style="list-style-type: none"> This is an expert-based approach that cannot be applied by communities themselves. Does not emphasize cyclical learning on sustainability issues.

NAME	STRENGTHS	WEAKNESSES
around Simen Mountains National Park in Ethiopia	<ul style="list-style-type: none"> Focus on the local community level. 	
<i>Location specific / Single level tools</i>		
Regional or state level		
Solution Spaces for Decision Making	<ul style="list-style-type: none"> Provides ideas on how to extend EIA or into SA. Gives procedures for a SA process that encompasses expert and participatory approaches. 	<ul style="list-style-type: none"> Technical and cannot be applied by communities themselves.
Western Australia Sustainability Strategy	<ul style="list-style-type: none"> Complementary role to other sustainability initiatives indicates how SA fits into these. Gives ideas on how to expand the EIA process and integrate to create an effective SA process. 	<ul style="list-style-type: none"> Technical tool applied by government authorities and experts. Not for use at local community level by communities themselves. Level of application if for higher governance levels including national and regional and not community level.
Sustainability appraisal of regional spatial strategies and local development plans for the United Kingdom.	<ul style="list-style-type: none"> Complements other planning processes to be undertaken - not as a standalone process. Informs on how to select sustainability objectives on the basis of relevant policy and regulatory framework. Makes provisions for participation. 	<ul style="list-style-type: none"> Not for community level but for other higher levels. Level of participation is consultation and not empowerment.
Systemic and Prospective Sustainability Analysis	<ul style="list-style-type: none"> Development of indicators in a participatory manner allowing reflection and learning by all relevant stakeholders. Cyclical approach dealing with all the stages of the learning cycle. 	<ul style="list-style-type: none"> Requires experts for it to be applied. Not for community level. Focuses mostly on selection of indicators rather than on other components of an SA process.
Integrated Sustainable Cities Assessment Method	<ul style="list-style-type: none"> Deals with complexities of sustainability and informs vision clarification. Can be applied at multiple governance levels. 	<ul style="list-style-type: none"> Technical. Designed for use in urban areas.
Assessing Sustainability of Societal Initiatives and Proposing Agenda for Change	<ul style="list-style-type: none"> Describes what is entailed within an SA process by giving ideas on how to categorize sustainability assessment processes into preliminary and detailed ones. Level of participation is empowerment. 	<ul style="list-style-type: none"> Designed for urban areas. Its application requires experts.
Hong Kong Sustainability Assessment system for integrated consideration of proposals	<ul style="list-style-type: none"> Indicates several substantive components of SA including principles, indicators. Has a community engagement component. Has a funding component for 	<ul style="list-style-type: none"> Focus is not solely on biodiversity. It is designed for strategic proposals not existing activities. Not designed for application by rural communities themselves, requires expert input in some aspects.

NAME	STRENGTHS	WEAKNESSES
	support of community SA initiatives.	
Community or neighborhood or village		
Global Eco-village Network	<ul style="list-style-type: none"> • Applicable at community level to be administered by local communities themselves. Rapid assessment technique whose application requires less time, capacity building and resources compared to other community level SA tools. Allows reflection and learning for change towards sustainability. 	<ul style="list-style-type: none"> • Subjective tool using a checklist approach, serves better as a complement to other SA tools.
Local Agenda 21 campaign by the International Council for Environmental Initiatives	<ul style="list-style-type: none"> • Participatory processes for planning by communities themselves. Relevant to local level use and uses multiple-stakeholder forums for collective decision-making. 	<ul style="list-style-type: none"> • Designed for cities and not for rural communities. Relatively technical for self-administration for poor rural communities. Requires more time and capacity building for it to be applied.
Strengthening rural areas approach	<ul style="list-style-type: none"> • Can be administered by local communities themselves. Uses a participatory approach and its substantive and process aspects fit requirements of rural communities for prioritization of issues and sustainability learning. 	<ul style="list-style-type: none"> • Its application requires more time and capacity building than the CSA. It requires more resources in terms of finances and this is a disadvantage especially for poor rural communities in developing countries.
Australian local sustainability initiative	<ul style="list-style-type: none"> • Achievement recognition matrix suitable for local authorities and local community organizations. Provides a framework for monitoring, evaluation and implementing sustainability priorities. 	<ul style="list-style-type: none"> • Not suitable as a self-administered tool for local communities.
Integrated approach for evaluation of coastal zone sustainability in Shanghai Municipality and Chong Ming Island, China	<ul style="list-style-type: none"> • Socio-economic development is a key requirement for poor rural areas but need not occur at the expense of the environment. • This also implies that economic growth might be slower in the short term in areas where the institution of protective measures for ecosystems well being may result in slower economic growth in the short term. • Indicators used in sustainability assessment need to match the situation at hand that in this study should be related to biodiversity conservation issues. 	<ul style="list-style-type: none"> • Focuses on only one governance level and this does not cover the community level. • It is a predominantly expert-based approach. • It is characterized by consultation as the type of stakeholder participation and not empowerment as required by the MDTP. • Does not cater for information needs of the disadvantaged and marginalized groups of society because it focuses on the information needs of government authorities.

APPENDIX 2

Names of research team members, assistants, participants and dates for data collection.

Research Team

- Limpho Letšela - University of the Free State
- Prof. Maitland Seaman - University of the Free State
- Prof. Herman van Schalkwyk - University of the Free State
- Mr. Obi Achuruchuku - University of the Free State
- Dr. Fidelis Esenjor - Leads Services
- Maleshoane Mathe - Leads Services
- Nthabiseng Mphana - Leads Services
- Ntsoti Tjabane - Leads Services

Research Assistants

- Tlhohonolofatso Nkhase
- Lebohang Khanyapa
- Mampho Ramaisa
- Seisa Ramaisa
- Mapalesa Rantso
- Mpine Molise

MDTP staff at national level

- Mr. Chaba Mokuku - MDTP Project Coordinator
- Ms. Thato Parrow - MDTP Social Ecologist
- Dr. Patrick Mamimine - MDTP Ecotourism Specialist
- Mr. Tankiso Mabote - MDTP GIS specialist

- Mr. Taole Tesele - MDTP Conservation planner

MDTP District staff and other key respondents

- Mr. Paul Nkofo - District Conservation Officer Qacha's Nek
- Mr. Mothusi Mohai - MDTP District Conservation Officer Butha Buthe
- Mr. Phallang Lebesa - MDTP District Conservation Officer, Mokhotlong.
- Ms. Theresa Tau - MDTP community facilitator, Qacha's Nek.
- Mr. Mokuena Mokoena - MDTP community facilitator, Butha Buthe and Leribe.
- Mrs. Malintle Mtlakeng - MDTP community facilitator, Butha Buthe
- Mrs. Mantsitsi Mona - MDTP community facilitator, Mokhotlong

Interviewees at the national level

- Ms. Jane Malephane - Principal Environment Officer - Outreach (NES)
- Ms. Thikhoi Mathealira - Director Human Resources Development, Lesotho Tourism Development Corporation (LTDC).
- Mrs. Makaizer Mohlouoa - Director Research and Development LTDC.
- Mr. Ramatlali Nkhahle - Manager Investment Promotion, LTDC.
- Mrs. Malintle Mofolo - Ministry of Agriculture
- Ms. Bernice Puling - National Environment Secretariat
- Ms. Mamuru Machae - Economic Planning
- Mr. Moeketsi Rakhomo - Chairman, Community conservation forum for Tšehlanyane.
- Mr. Johannis Mphanya - Corporal ranger, Tšehlanyane National Park.
- Mr. Mohalenyana Mohale - Principal Chief, Thabang, Mokhotlong
- Mr. Thabiso Nkune - Chairman District Tourism Association, Mokhotlong

Members of District Steering Committees

Butha Buthe

- M Moeketsi - Police
- P Leoatla - Traditional doctors
- M Molisana - Environment
- T Seeiso - Police
- T Mosouenyane - Police
- M Mabaleha - Forestry
- R Liane - Conservation
- M Motjotjoto - Agriculture
- S Nkhopela - Local Government
- P Monaheng - Forestry
- B Malebese - Forestry
- M Mosenene - Police
- M Talimo - Chief
- M Nyamatsane - Grazing association
- K Khobethi - Forestry
- Q Qophe - Grazing association
- K Koakoatsi - Livestock farmer
- T Makhoabenyane - herd boys
- T Nchee - Initiation school instructors
- M Mosouenyane - Planning
- M Dolo - Rural Development
- M Motsoaole - Rural Council
- L Sarele - Initiation schools
- B Ramonotsi - tour guiding
- M Mokone - herdboys

- N Mota -Youth

Qacha's Nek

- T Khalata - Chief
- M Rabele - MP Secretary
- H Taunyane - Chief
- S Seahle - Chief
- M Mpiti - Chief
- M Meletsane - Chairperson
- M Tsolo - Rural council
- T Thatho - Rural Council
- M Mokhesi - Sehlabathebe National Park management committee
- M Nkuebe - Sehlabathebe National Park
- L Lebesa - Office of the District Secretary
- M Moeketse - Tourism
- K Mohapi - Environment
- M Motloi - Tourism associations
- L Lenkoane - Police
- T Mpeke - Local Government
- M Ramosajana - Land use planning
- M Mohapeloa - District Planning Unit
- M Chabana - Range Division
- M Semoli - Sehlabathebe Range Management Area
- T Matlanyane - Forestry
- M Mpeka - Agriculture
- N Ralengau - Lesotho News Agency
- M Faere - Roads
- M Koali - Traditional Doctors

- S Lefata - Stock farmers
- M Molemohi - WIB
- M Kena - Historian

Mokhotlong

- M Mohalenyane - Chief
- T Letsie - Chief
- S Lerotholi - Chief
- M Rapolatsane - Chief
- M Sekonyela - Chief
- M Letompa - Chief
- K Moshoeshe - Farmer (Livestock)
- M Letsoara - Farmer (Livestock)
- B Motalasi - Farmer (Crops)
- M Hlasa - Farmer (Crops)
- K Mothokoa - Traditional doctor
- D Kutoane - Traditional doctor
- H Sekonyela - Initiation Schools
- M Motlohi - Initiation Schools
- T Klass - NSS
- M Lehloenya - NSS
- M Tsepe - Rural Council
- M Tsita - Rural Council
- L Ratabane - Rural Council
- R Morojele - Rural Council
- K Letsoisa - Grazing association
- S Mpalami - Grazing association
- M Mzamane - Youth
- M Makhetha - Youth

- L Lethunya - Herdboys
- M Molapo - NGOs
- M Lephoto - Rural Development
- M Mokhena - Rural Development
- N Maliehe - Range
- L Makhanya - District planning
- T Ntholeng - District planning

Dates for interviews, group discussions and field investigations in the three districts

District	Dispatch Date	Commencement	Completion	Return Date
Mokhotlong	27/10/05	27/10/05	1/11/05	2/11/05
Leribe	24/10/05	24/10/05	29/10/05	30/10/05
Qacha's Nek	24/10/05	24/10/05	29/10/05	30/10/05

Dates for workshops

District	Arrival Date	Date	Departure Date
Butha Buthe / Leribe	7/11/2005	8/11/2005	9/11/2005
Mokhotlong	9/11/2005	10/11/2005 - 11/11/2005	11/11/2005
Qacha's Nek	16/11/2005	17/11/2005	18/11/2005

APPENDIX 3

Description of the three study sites (An excerpt from MDTP, 2006)⁴⁶

MOKHOTLONG DISTRICT - SANI TOP DEVELOPMENT NODE

The study site located within the Mokhotlong district was the Sani Top Development node. Sani Top lies in the Eastern part of Lesotho and comprises 16 villages, scattered in and around the spectacular and sky-piercing Maloti-Drakensberg mountains. The highest altitude is 3 482m, represented by the 'breast-and-nipple' shaped and towering Thabana Ntlenyana peak. On the South African side the node shares a boundary with the World Heritage site of Ukhahlamba-Drakensberg Park. The node is also the source of one of the longest rivers in the region, the Senqu River, which meanders through South Africa and Namibia on its way to the Atlantic Ocean. Within the same node lies the town of Mokhotlong which is the administrative centre of Mokhotlong district and is about 40km North North West of Sani Top border post (Photo 1).

Photo 1: Sani Top border post (Altitude 2895m)



⁴⁶ The author was part of the team which compiled this MDTP (2006) consultancy report. This appendix is an excerpt from this report.

The lure of visitors to Sani Top is primarily the Sani Pass scenic route down or up the mountain, depending on the direction one is coming from. The scenic, challenging and winding route is a strong draw card for 4x4 vehicles or 4x4 enthusiasts. It makes a gradual but steep rise to an altitude of 2895m from 'valley-like' South Africa, sitting on an altitude of less than 2200m. Below is a sectional view of the famous Sani pass route to and from Lesotho (Photo 2).

Photo 2: A view of the spectacular Sani pass 4x4 route captured from Sani Top



QACHAS'NEK DISTRICT - SEHLABATHEBE DEVELOPMENT NODE

Sehlabathebe is the study that was located in Qachas' Nek district. The centre piece of the Sehlabathebe Development node is the Sehlabathebe National Park (SNP). It lies on 29°55'S and 29°08'E in the south-eastern corner of Lesotho in Qacha's Nek district. Altitude ranges from 2 200-2 600 meters with an average elevation of 2 400 meters. The Park falls under IUCN Management Category 1V (Managed Nature Reserve), in Biogeographical Province 3.22.12 (South African Highlands) and forms a border with Kwazulu-Natal province of South Africa. It

was established on 27 February 1970 by the Lesotho Government Gazette Notice No. 34. As Sehlabathebe Wildlife Sanctuary and "National Park" (under the Game Preservation Proclamation) with an area of 6,805 hectares.

The park is characterised by mountains and grassveld with striking outcrops of sandstone, (Photos 3 and 4) which occur at the contact between the Cave Sandstone and the Drakensberg Basalts at 2,380m. This junction occurs at a considerably higher altitude here than elsewhere in Lesotho and the greater exposure of the rock probably results in increased weathering into caves, pillars, arches, and potholes. The park is dissected by the Tsoelikana river and there are numerous small streams and pools. Much of the park is snow and ice-covered in winter.

The area consists of a species-rich highveld of subalpine grasslands. There are also patches of wet meadow and marshland at all altitudes and small areas of dwarf shrub heaths on steep and rocky ground. Aquatic vegetation is well represented in the Tsoelikana River and its oxbow lakes, in rock pools produced by differential weathering of the Cave Sandstone where *Aponogeton ranunculiflorus* (discovered in 1970) is present, and in shallow ephemeral pans. There are scattered tall shrubs of *Polemanna montana*, *Rubus ludwigii*, *Rhus spp.*, *Leucosidea sericea*, *Euryops spp.* and *Helichrysum spp.* on cliff ledges, rocky ground and other sites protected from fire and browsing animals. However, these form actual open scrub only on one or two high ledges on Thaba Nts' o outside the park boundary. Only two small plants of *Protea spp.* survive in the park area, although near the park there is *Protea* savanna grassland.

Photo 3: Rock formation in SNP



There are few games. Mammals include a resident population of a few black wildebeest *Connochaetes gnou* and rhebok *Pelea capreolus*, mountain reedbuck *Redunca fulvorufula* and occasional eland *Taurotragus oryx* and oribi *Ourebia ourebi* which stray into the area from Kwazulu-Natal and leave when the winter snow arrives, baboon *Papio* sp., black-backed jackal *Canis mesomelas*, wildcat *Felis silvestris* and otter *Lutra* sp. Birds include southern bald ibis *Geronticus calvus* (R), white stork *Ciconia ciconia*, black-headed heron *Ardea melanocephala*, bald ibis *Geronticus calvus*, cape vulture *Gyps coprotheres* and lammergeier *Gypaetus barbatus* (largely confined to the Drakensberg Mountains in Southern Africa). The Tsoelikana river harbours the threatened minnow-like fish *Oreodaimon quathlambae*, once thought to be extinct. Some of the sandstone caves and arches in the Park contain Bushman paintings that are of immense tourism value.

Photo 4: View of SNP also showing the disused laboratory or research centre



Access to the park is by horse or four-wheel drive vehicles and horses can be hired from the local community. Accommodation is available at the park lodge. There is a landing strip at Ha Paulus but for light aircraft only. The following excerpt from *African Wildlife*", Volume 33, No. 5 speaks volumes about the need to conserve the remaining biodiversity:

"Up in the high rock pools at Sehlabathebe float the white stars of one beautiful small flower which Dr Fred Hoener, the then Park biologist, called 'the crown jewels of Sehlabathebe'. In Sehlabathebe's streams darts a small minnow-like fish, 'oreadaimon quathlambae', 'the spirit of the Drakensberg'. It is a rare indigenous fish adapted to survive these cold high mountain streams, and for 30 years was believed to be extinct until it was rediscovered

in the Tsoelikana River at Sehlabathebe in 1970. Bird life is abundant and includes Rock Jumpers, Bald Ibis, Cape Vultures, Lammergeyers, and migrants such as the White Stork, Crowned Crane and Black-headed Herons."

BOTHA BOTHE DISTRICT - TS'EHLANYANE DEVELOPMENT NODE

Ts'ehlanyane is the study area that was selected for the Butha Buthe and Leribe districts. The district of Leribe is home to this nature conservation area. Since the MDTP offices were located in Butha Buthe and the majority of the members of the District Steering Committee came from Butha Buthe, this study site was named under the Butha Buthe district and not Leribe district in this study. The hub of Ts'ehlanyane development node is Ts'ehlanyane National Park. The Park is 30 km from the main A1 route/road to Butha-Buthe. It is an ambitious project that goes beyond just conservation of the indigenous forest found there, other alpine flora and the animal life. Ts'ehlanyane Nature Reserve (Category II National Park) was established to preserve outstanding indigenous and unique *leucosidia* woodland, and to turn it into a tourist attraction center, with a lodge, conference center, hiking trails, and other recreation areas (see Photos 5, 6, 7).

The Park is located deep in the front range of the Maluti Mountains, with headquarters at the foot of the Holomo Pass. The reserve owes its origin to the access road to the Hlotse tunnel for the Lesotho Highlands Water Project. This protected area lies at the junction of the Ts'ehlanyane and Holomo rivers on the western scarp of the Front Range of the Maluti mountains. Over 5 600 hectares of extremely rugged mountain terrain is protected within this park, which includes one of the very few indigenous woodlands in Lesotho. Some of the finest examples of *Leucosidea sericea* or 'Che-Che', woodland are preserved at the heart of this area, with a number of undergrowth plants that are unique to this woodland habitat. On the banks of the rivers and streams are stand of berg bamboo, which besides being of cultural significance to the

Basotho people, provide a habitat for the endangered butterfly species, *Metisella syrinx*. The reserve also encompasses a reasonable proportion of mountain 'fynbos' with a high degree of endemism.

Photo 5: Visitor Rondavel hidden right in the thick bush of Ts'ehlanyane National Park



The communities around Ts'ehlanyane are Ha 'Mali, Ha Mohale, Ha Lekhoele, Masianokeng, Ha Puseletso and Mahana-puso. They practice subsistence agriculture and harvesting natural resources for a variety of needs, mainly firewood, handcrafts, medicine, food, construction, and socio-cultural amenities. They have done so since time immemorial and are singularly responsible for the good conservation value that the area represents. The area has the longest history of conservation championed by a local traditional authority in Lesotho. To date, one hundred forty-seven species of plants have been identified, falling into 51 families with the most commonly used families being *Asteraceae*, *Liliaceae sens. lat.* and *Poaceae*.

Photo 6: An example of scenery inside Ts'ehlanyane National Park



The scenery in this area is stunning and can be easily combined with the nearby Bokong reserve and the spectacular Mafika-Lisiu Pass. On a clear day, from the summit of this pass, the eye can see as far as the Free State border town of Ficksburg, in South Africa. The excellent road twists its way up the pass to the last hairpin bend giving the traveller changing scenes of absolutely beautiful scenery. The sites of Bokong information office and wetland are just minutes away from the summit of the pass.

Photo 7: Another scenery inside Ts'ehlanyane National Park



APPENDIX 4

Guidelines for interviews, group discussions and field observations

1. Information needs

- What type of information would your agency like to have about MDTP to:
 - Inform your strategic plans, management plans, other decision making, project design?
 - Monitor, evaluate and analyze impact?
 - Report on international conventions, state of the environment reporting and other themes - which themes does your agency need to report on?
 - Raise awareness about sustainable development issues?
- How would you like to be engaged in assessment activities: collecting, analyzing and evaluating information related to the MDTP?

2. Aspects that need to be sustained in the MDTP

- Which social aspects are of interest to your agency and need to be sustained in the MDTP? Why?
- Which economic aspects are of interest to your agency and need to be sustained in the MDTP? Why?
- Which ecological/environmental aspects are of interest to your agency and need to be sustained in the MDTP? Why?
- Which institutional aspects are of interest to your agency and need to be sustained in the MDTP? Why?

- What needs to be developed? For economy, ecology, institutions and society? Why?
- Which practices do you regard as unsustainable and
- What unsustainable practices are affecting the sustainability of your agencies stake in the MDTP and need to be stopped? Why?

3. Biodiversity and ecosystem services in the MDTP

- How has biodiversity in the MDTP changed?
- How is biodiversity useful to human life in the MDTP area?
- What is your view of having enduring benefits from biodiversity for both current and future generations?
- How are the benefits from benefits changing in the MDTP?
- What do you think caused or is causing these changes?
- How have these changes affected human well being now?
- What are the implications for future generations?
- How might ecosystems change in the future a) with and b) without MDTP intervention?
- What are the implications for human well being?

4. Participation

- What are your views about the importance of participation of stakeholders (national, district and local) in decision making? Why?
- What is your opinion regarding participation of stakeholders in environmental or sustainable development decision making? Is it effective? Reasons?
- How best can participation of stakeholders be enhanced in sustainability initiatives in the MDTP?

- How best can stakeholders related to your agency activities be engaged at all levels? Internationally, nationally, district and locally?

5. Sustainability assessment framework

- What are your views with regard to measuring progress towards sustainable development in the MDTP?
- What should assessment entail? Why?
- Which geographic scale is more appropriate for the MDTP sustainability assessment focus on? Why?
- Who should be involved in the assessment? Why?
- How should they be involved?
- Looking at the needs of the MDTP at this stage, what role should assessment serve? Data needs and process needs? Both?
- What scope should assessment in the MDTP cover? Reasons?
 - existing activities at community level for reflection and raising awareness
 - proposed activities - EIA driven for future proposals
 - past activities
 - interrelations between sustainability issues
 - sector related issues
 - learning and reflection
 - data focus

6. Observation issues

- Cultivation practices
- Condition of rangelands
- Tourism developments
- Landscape features