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MAPPING THE POSSIBILITY OF CONDUCTING AN ECONOMICS OF LAND DEGRADATION STUDY IN LESOTHO: A FRAMEWORK FOR PROMOTING WETLAND SUSTAINABILITY

Moselantja Rahlao
Department of Range Resources Management
Ministry of Forestry, Range and Soil Conservation
Lesotho
moss.rah@gmail.com

Supervisor
Dr Hafdís Hanna Ægisdóttir
Institute for Sustainability Studies
University of Iceland
hafdishanna@hi.is

ABSTRACT

Land degradation reduces natural capital productivity and jeopardizes sustenance of life. The international community is abating land degradation through various frameworks and conventions. Many countries in sub-Saharan Africa, including Lesotho, are not an exception to land degradation, hence the adoption of Land Degradation Neutrality. Water is a valuable economic resource in Lesotho. Wetland catchments contribute to hydropower for Lesotho and water supply to four countries in Southern Africa. These ecosystem services are, however, threatened and efforts of curbing wetland degradation in Lesotho have been unsuccessful as degradation continues. Interventions to curb wetland degradation have hitherto excluded assessment of the monetary value of natural resources and the investment costs involved as opposed to the benefits. The Economics of Land Degradation framework is fundamental for valuing ecosystem services and realising the trajectory of sustainability. The aim of this study was to increase awareness among policymakers regarding the importance and value of wetlands in Lesotho using the Lets'eng-la-Letsie wetland as a reference study area. This was achieved by mapping out opportunities of conducting a cost-benefit analysis towards developing a wetland protection policy. Semi-structured interviews were used for data

collection with decision-makers as informants. Findings of the study indicated that policymakers are aware of the intrinsic value of wetlands even if they are degraded. However, a new policy is not seen as feasible because of the existing harmonisation of relevant institutional policies. The study has set the baseline for adopting the Economics of Land Degradation methodology in sustainable land management for the development of Lesotho. Valuing ecosystem services will help to break the existing science-policy interface gap that hinders the restoration and resilience of ecosystems. This study provides an empirical framework towards achieving sustainable development. Therefore, it recommends increased awareness and capacity building among the public, including policymakers, of the importance, value, and management of wetlands.

Key words: wetlands, sustainability, economics of land degradation, Lesotho, policy

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ABBREVIATIONS

CBO's	Community-Based Organisations
DRRM	Department of Range Resources Management
ELD	Economics of Land Degradation
GEF	Global Environmental Facility
GoL	Government of Lesotho
ICM	Integrated Catchment Management
LDN	Land Degradation Neutrality
LHDA	Lesotho Highlands Development Authority
LHWP	Lesotho Highlands Water Project
MFRSC	Ministry of Forestry, Range and Soil Conservation
NGOs	Non-Governmental Organisations
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
WAMPP	Wool and Mohair Promotion Project
WOCAT	World Overview of Conservation Approaches and Technologies

1. INTRODUCTION

1.1 Background

Land degradation is a global challenge threatening ecosystem services that sustain life on Earth. Globally, between 20-40% of land is estimated to be degraded (UNCCD 2022) and Africa is the most negatively impacted region in the world, facing possibilities of increased severity (Gisladottir & Stocking 2005; ELD [Economics of Land Degradation] Initiative & UNEP 2015; UNCCD 2022). Land degradation refers to the decline in production and economic value of land resources owing to anthropogenic activities amplified by natural processes (ELD Initiative 2015a; Pacheco et al. 2018; Barbier & di Falco 2021; Rahlao 2021; UNCCD 2022). The international community is striving to abate this challenge, for example through the United Nations Convention to Combat Desertification (UNCCD), where approaches such as Land Degradation Neutrality (LDN) are being highlighted (UNCCD 2022). Similarly, the Sustainable Development Goal (SDG) no. 15 (Life on Land) strongly prioritises restorative land management practices and declares to: "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" (UN 2021, p. 22). Moreover, WOCAT [World Overview of Conservation Approaches and Technologies] et al. (2022) highlights that Sustainable Land Management (SLM) remains fundamental to address land degradation. Land degradation is a serious challenge in many countries in Sub-Saharan Africa and Lesotho is not an exception, hence the adoption of LDN in 2015 (MFRSC [Ministry of Forestry, Range and Soil Conservation] 2017; Liemo Likoti 2019). The country has a state target to ''Achieve LDN by 2030 as compared to the 2015 baseline and an improvement of 5% of the land....'' (MFRSC 2017).

1.2 Importance of ecological capital and challenges

Natural ecosystems improve human wellbeing through providing regulating, supporting, provisioning and cultural ecosystem services (Balmford et al. 2002; MEA [Millennium Ecosystem Assessment] 2005; ELD Initiative 2015a; Lin et al. 2017; Ramsar Convention on Wetlands 2018). The SLM framework underpins socio-economic and environmental provisions, which are also channelled towards human security (Giger et al. 2018; UNCCD 2022; WOCAT et al. 2022). However, human beings have mounted pressure on natural resources by unsustainable use, causing reduced access to benefits from nature and tipping beyond most of the planetary thresholds (Rockström et al. 2009; Steffen et al. 2011; Persson et al. 2022). Estimates indicate a decline of six up to 11 trillion USD in ecosystem services caused by land degradation (ELD Initiative 2015a). The disconnection between the total natural resources facilitating the delivery of ecosystem services for livelihood resilience and ecological stability (Fig. 1) hinders sustainable human prosperity (Costanza et al. 2014; ELD Initiative 2015a). Hence, a paradigm shift and a call for action to achieve the SGDs are needed to fulfil the 2030 agenda.

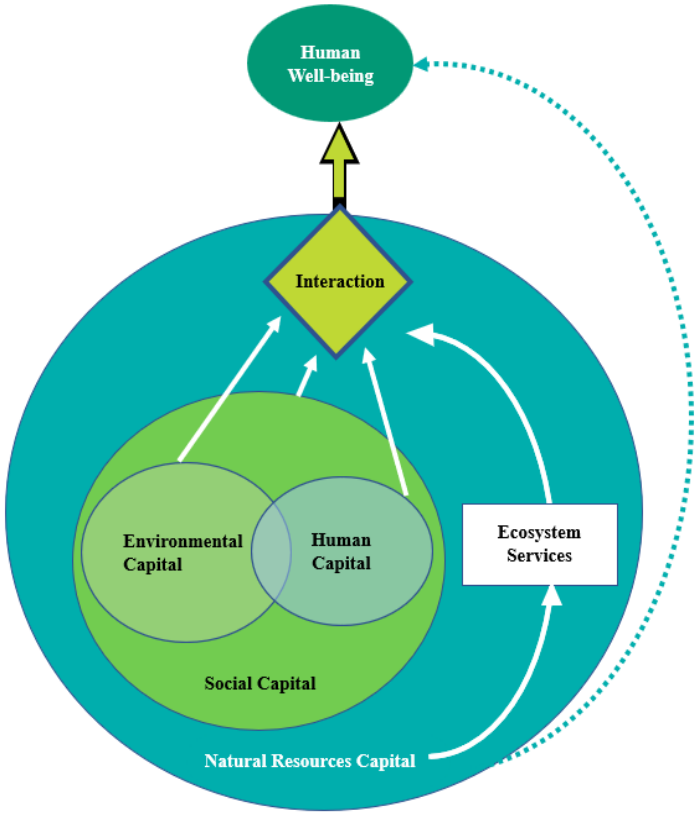

Figure 1. The disengagement between natural capital and human welfare sustainability. (Source: Adapted from Costanza et al. 2014 and ELD Initiative 2015a).

The Economics of Land Degradation (ELD) is a fundamental tool for valuing ecosystem services and realising the trajectory of sustainability (Balmford et al. 2002; ELD Initiative 2015a; ELD Initiative & UNEP 2015). This involves rewarding communities to accelerate financial investments, improve community participation and reduce overexploitation of resources with the aim to achieve sustainability. The issue of incentivising developing countries is also motivated by the UNCCD, the United Nations Environment Programme (UNEP) and the Global Environmental Facility (GEF) (Gisladottir & Stocking 2005). Moreover, the ELD framework is a bridge towards an informed policy that is conventional and impactful (Berghöfer & Schneider 2015; ELD Initiative 2015a; Berghöfer et al. 2016; Patra & Basu 2021; Polasky & Daily 2021; WOCAT et al. 2022), though it has been side-lined in decision making and policy development (Finlayson et al. 2005; de Groot et al. 2006; Nkonya et al. 2011; Lin et al. 2017; Polasky & Daily 2021).

Lesotho has only minimally assessed the total economic value of wetlands, e.g., the Khubelu wetlands (Moqekela 2016) and the Lets'eng-la-Letsie wetland (Kathryn et al. 2009), and has not embarked on developing a policy driven by the economics of land degradation towards restoration. Lack of economic assessment of wetlands has contributed to decreasing their natural potential because making decisions about their utilization is not holistically informed but is limited only to their ecological importance (de Groot et al. 2006; Grundling et al. 2015).

1.3 Justification for adopting the Economics of Land Degradation

Efforts to curb wetland degradation in Lesotho have been unsuccessful as the degradation is continuing (Grundling et al. 2015). These interventions have excluded assessment of the monetary value of natural resources and the investment costs as opposed to the benefits (Nkonya et al. 2011; ELD Initiative & UNEP 2015). It is against this background that it would be valuable to map the likelihood of implementing the Economics of Land Degradation concept to meet sustainable use of wetlands and the prospect of developing a policy on wetland protection and restoration in Lesotho.

1.4 The goal and objectives of the study

The overall goal of this study was to increase awareness among policymakers regarding the importance and value of wetlands in Lesotho. As a step towards achieving this goal, this study mapped opportunities for conducting a cost and benefit analysis in connection with development of a wetland protection policy.

The specific objectives of the study were:

1) To identify gaps in existing stakeholder policies regarding wetland protection in Lesotho.
2) To prepare and build an argument for introducing the concept of cumulative costs of inaction on degradation against the benefits of restoring wetlands in Lesotho (Economics of Land Degradation framework).
3) To map opportunities, challenges and resources needed to conduct a cost and benefit ELD study in the Lets'eng-la-Letsie wetland area in Lesotho.
4) To evaluate the willingness of policymakers in Lesotho to adopt the ELD framework going forward.

It is worth noting that, based on time limitation, this study focused on the Lets'eng-la-Letsie wetland, although degradation is also prevalent other wetlands in Lesotho.

1.5 Significance of the research

The study intends to provide fundamental insights that can be helpful in filling the gaps and informing policymakers about wetland management and sustainability in Lesotho. Policymakers will be informed about the Economics of Land Degradation concept and the intrinsic value of wetlands nationally and internationally. This unpacks the advantages of abating wetland degradation and disadvantages of a business-as-usual situation regarding wetland protection in Lesotho. The intention is to urge policymakers to help improve wetland sustainability through research-based recommendations.

2. LITERATURE REVIEW

2.1 Land degradation in Lesotho

Land degradation is a decline in the potential of land ecosystems to deliver goods and services owing to anthropogenic factors (Ziervogel & Calder 2003; Mukuku et al. 2004; WAMPP [Wool and Mohair Promotion Project] 2014). It is an international threat to all key pillars of sustainable development; environment, economic and social (ELD Initiative 2015a). Land

degradation is a major environmental issue in Lesotho and is mainly caused by unsustainable land use practices, particularly mismanagement of rangelands and limited access to agricultural technologies (Majara 2005). Furthermore, invasive plants compromise structure, diversity, and composition of plant communities, hence it is considered a threat to the rangelands of Lesotho (Mukuku et al. 2004; Grundling et al. 2015; Rahlao 2021). Pervasive invasive plants continue to modify the functionality of rangeland ecosystems and such alterations may not be reversed depending on the ecosystem's resistance (Briske 2017).

The climatic conditions in Lesotho, varying from extended droughts to erratic rainfalls, shallow soils, and patchy plant cover, increases erosion susceptibility (Martínez-Mena et al. 2020). Various forms of land degradation are evident in the country and are dominant landscape features. Soil erosion, particularly water erosion, leaches nutrients and organic carbon leading to a reduced soil fertility and its ability to maintain biota (Martínez-Mena et al. 2020). Consequently, millions of tons of soil are eroded annually (Makara 2013), threatening the livelihoods of people who rely on agriculture (Majara 2005).

Flawed land use practices and climate change are the main factors responsible for the degradation of wetlands in Lesotho (Chatanga & Seleteng-Kose 2021). For example, cultivation and grazing within the proximity of wetlands accelerates wetland degradation and unsustainable land management reduces soil fertility and influences productivity of both agricultural land and rangelands (Ziervogel & Calder 2003; Mukuku et al. 2004; WAMPP 2014; FAO 2017; BoS [Bureau of Statistics] 2020a, 2020b). In general, poor people are natural resource dependent. These poor communities end up overexploiting natural resources to make a living. The land tenure system in relation to rangeland management also enhances overgrazing (Nüsser & Grab 2002; Liemo Likoti 2019) as it gives free access to everyone without limits. This is a typical example of the tragedy of the commons[1] with critical implications for use and management of land resources.

2.2 Challenges of wetlands in Lesotho

Wetlands in Lesotho are located upstream within rangelands and do not only support households locally, but also the neighbouring South Africa (Grundling et al. 2015; ReNoka 2020), as well as the Southern African Development Community (SADC) region (Chatanga et al. 2020). Nevertheless, wetlands of this critical value continue to be degraded while management remains unsustainable. Wetlands are threatened and degraded due to multifaceted causes (MEA 2005; Polasky & Daily 2021). In Lesotho, wetlands, including Lets'eng-la-Letsie, are degraded by varying social factors, such as the land tenure system, overexploitation of rangeland resources and livestock grazing (Kathryn et al. 2009; DRRM [Department of Range Resources Management] 2014; Grundling et al. 2015; Ramsar Convention on Wetlands 2018; Chatanga & Sieben 2019; Chatanga & Seleteng-Kose 2021; Kahlolo et al. 2021).

2.3 Combating land degradation in Lesotho

Land management planning and national policies are greatly influenced by international bodies interested in pushing for sustainable development (Nkonya et al. 2011). Lesotho is a party to environmental conventions and treaties such as the United Nations Convention to

[1] Tragedy of the commons refers to managing common-pool resources characterised by lack of responsibility and unity.

Combat Desertification (UNCCD), the RAMSAR Convention on wetlands and the global Sustainable Development Goals (SDG's) to mention a few. These conventions are founded on goals to enhance human welfare and to protect and restore ecosystems, including the alleviation of land degradation (Gisladottir & Stocking 2005). In Sub-Saharan Africa, it is estimated that the "price" of land degradation is 10% of the total gross national income (Nkonya et al. 2011), hence efforts to rehabilitate dryland ecosystems should be escalated.

The UNCCD (2022) describes Land Degradation Neutrality (LDN) as "a state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems." (p. xvii). In response to land degradation, the Government of Lesotho (GoL) adopted the LDN concept in 2015 (MFRSC 2017; Liemo Likoti 2019). In congruence with the idea, Lesotho set a national target to achieve the LDNs by 2030 through implementing restorative measures, especially within the operations of the Ministry of Forestry, Range and Soil Conservation (MFRSC). The LDN framework is underscored by the theory of change, including measures of neutrality and forming hierarchical levels: 1) avoiding land degradation, 2) reducing land degradation, and 3) reversing land degradation (Gichenje et al. 2019; UNCCD 2022). Lesotho has reached beyond the tipping point of land degradation; hence a major focus is on implementing ecological restoration measures to achieve land neutrality. In relation to wetlands, it has been implied by Chatanga and Seleteng-Kose (2021) that stakeholders responsible for wetland management need to strengthen restoration attempts.

2.4 Institutional framework for wetland protection in Lesotho

In Lesotho, wetlands are managed by different stakeholders such as the MFRSC, the Ministry of Local Government and Chieftainship Affairs (MLGCA), the Ministry of Tourism, Environment and Culture (MTEC), the Ministry of Agriculture and Food Security (MOAFS) and Ministry of Water (MW). The interconnectedness of these ministries has caused a lot of overlaps in management responsibilities resulting in a lack of identified boundaries. Thus, the sectoral confusion between these governmental institutions in Lesotho undermines wetland protection and conservation in the country. This is illustrated, for example, by lack of a strategic policy targeting the urgency of wetland degradation within individual stakeholder institutions (ReNoka 2021). Again, poor policy coordination amongst these stakeholders is unfavourable and raises a red flag for the country's ability to achieve the set LDN targets. This equally reflects impracticable strategies that have been designed but have never seen the light of the day (ReNoka 2021).

The MFRSC has been implementing rehabilitation measures to protect and restore wetlands, the Department of Range Resources Management (DRRM) guides the control of invasive plant species, and the Department of Soil and Water Conservation designs the structural conservation measures. However, these counteractive measures have so far been hardly successful (Grundling et al. 2015; Thabane 2020; Chatanga & Seleteng-Kose 2021). Challenges include poor institutional coordination, mixed laws amongst stakeholders and hiccups in adopting sustainable practices by farmers (Martínez-Mena et al. 2020). Integrated catchment management is implemented to holistically decrease land degradation impacts. This is achieved through the ReNoka Programme which is mandated to integrate the management of land and water resources (ReNoka 2021). The dismantled sectoral setting is a huge and foreseen challenge, hence ReNoka (2021) emphasises that: "adequate platforms and

mechanisms for intersectoral coordination of policy and strategy development, and for implementation, should be established at appropriate levels." (p.24).

2.5 The economic value of wetlands in Lesotho

Lesotho is a water-sufficient country (ReNoka 2020). The Lesotho catchment is composed of the Senqu, Makhaleng and Mohokare catchments (FAO 2017; ReNoka 2020). Water is perceived as an economic good in Lesotho with various benefits (Fig. 2). The predominant economic use is agriculture, which is dominated by livestock farming (ReNoka 2020). The total economic contribution of water, however, remains unconfirmed because of unregulated information existing in pockets within various ministries. Nonetheless, wetlands are the main source of available water for both economic and non-economic uses.

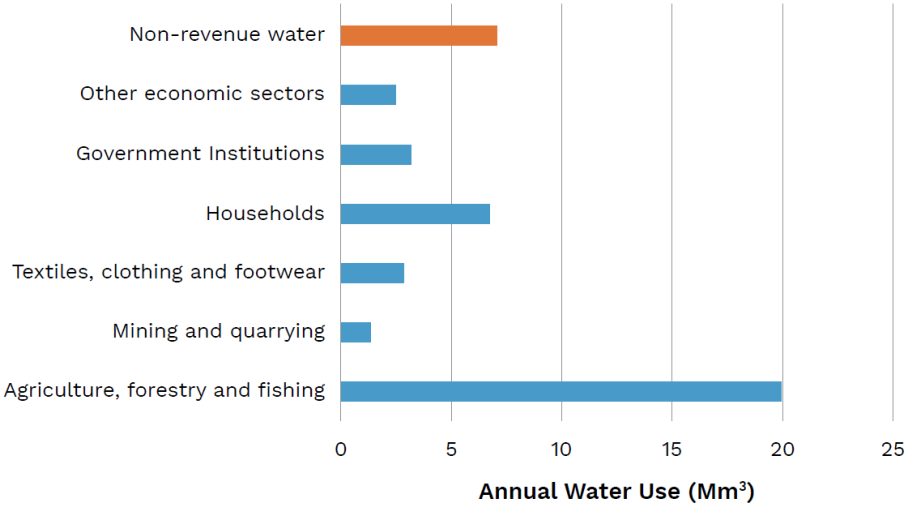

Figure 2. Different economical uses of water in Lesotho. (Source: ReNoka 2020).

The Lesotho Highlands Water Project (LHWP) has economic importance through the transboundary agreements for ecosystem service supply to the Orange-Senqu River Commission (ORASECOM)[2] member states. It is claimed that Lesotho gained a total of about 69 million USD in 2020 as royalties from water transfer to South Africa (Mokhethi & Kabi 2021).

Amongst many wetlands, Lets'eng-la-Letsie is a palustrine wetland in the southern part of Lesotho. It is special because it is a designated RAMSAR site, and thus a wetland of international importance[3] (Kathryn et al. 2009; Kahlolo et al. 2021). This wetland alone has an estimated economic value of 220 USD $ha^{-1}yr^{-1}$ (Kathryn et al. 2009). At the time of this study, ± 4,000 families derived ecosystem benefits from this wetland (Kathryn et al. 2009) but it is worth noting that there are high chances of future population fluctuations, in particular an increase. The Lets'eng-la-Letsie catchment plays an important role of providing hydropower

[2] ORASECOM is a cross-border catchment management tasked with sustainable water resources for Lesotho, South Africa, Botswana and Namibia.

[3] Ramsar site is a distinctive wetland type supporting biodiversity conservation in an area.

for Lesotho and water supply to South Africa (Matete 2006; Grundling et al. 2015) and Namibia (Chatanga & Seleteng-Kose 2021).

2.6 Adopting the Economics of Land Degradation framework

2.6.1 The Economics of Land Degradation concept

The Economics of Land Degradation (ELD) Initiative is an international organisation for sustainable land management, targeting the evaluation of the financial aspects of land degradation (ELD Initiative 2015a). This global framework is a forerunner in planning the control of land degradation by conducting cost-benefit analyses that help in prioritisation of restoration projects. The ELD Initiative aims to develop the monetary value of land, argue for natural capital, reverse climate change, and improve the supply of basic needs (ELD Initiative 2015a). Other countries in Africa (e.g., Botswana, Ghana, Kenya, Mali, Namibia, Niger, Sudan and Rwanda) and Asia (e.g., Georgia, Kyrgyzstan, Turkmenistan and Uzbekistan) have carried out case studies on costing action and inaction regarding land degradation and ecosystem restoration (Polasky & Daily 2021) while many other countries are not following suit, including Lesotho. The economical assessments of land-based degradation are in favour of the costs of land restoration interventions over the ramifications of following traditional approaches to land degradation (ELD Initiative 2015a). This clearly validates increasing stakeholders' awareness of the direct and indirect impacts of land degradation, hence the relevance of cost-benefit analysis as a tool for achieving sustainability. Targeted stakeholders from different backgrounds include academia, policymakers, and the business sector (ELD Initiative 2015a; Brandon et al. 2021).

2.6.2 The Economics of Land Degradation process

Different tools and methods exist for the process of valuing ecosystem services. The ELD initiative embraces the cost-benefit analysis in the field of sustainable land management (ELD Initiative 2015a). The ELD framework (Fig. 3) adopts a holistic outlook that regards multivariate land-use practices, human well-being, and implementable land management approaches at grassroots level. The analysis accounts for benefits derived from ecosystems and then unpacks expenses accrued by not limiting degradation over time.

The ELD Initiative methodology is a seven-step system that is unique to ELD (Fig. 3), used to set up a constructive and well-organised platform for valuing land resources. Ultimately, the framework puts the management system in the spotlight and enhances decision-making (Balmford et al. 2002; Nkonya et al. 2013; ELD Initiative 2015b). Ecological modifications, governance, and management practices together determine restoration (WOCAT et al. 2022). Hence management decisions regarding sustainable land management are influenced by benefits for the people. That is, when the cost of prevention of land degradation is lower or equivalent to gains, the decision is to promote land restoration, e.g., through incentivisation or payment for ecosystem services. The management becomes emphatic towards land restoration when the effort towards sustainability is outweighed by opportunities (Nkonya et al. 2013). Moreover, interventions are subject to the type of land degradation and the inherent driver behind the degradation (ELD Initiative & UNEP 2015).

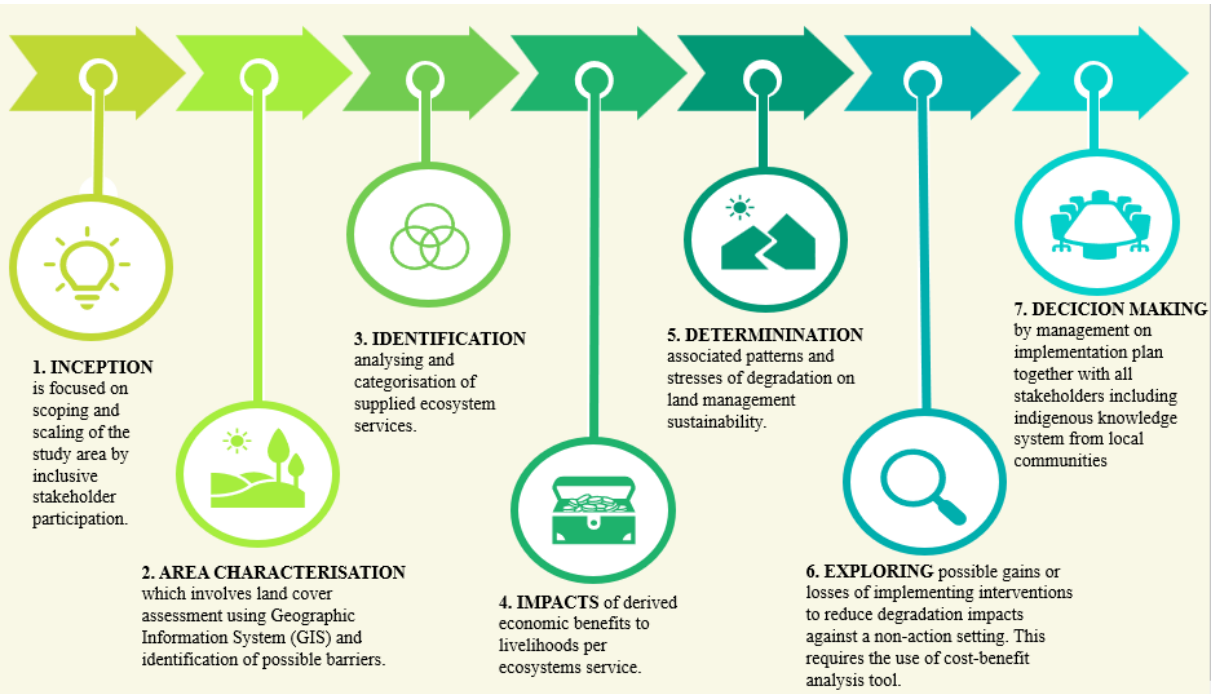

Figure 3. The schematic stages of the Economics of Land Degradation framework. (Adapted from Nkonya et al. 2013; ELD Initiative 2015a).

2.6.3 Benefits of adopting the Economics of Land Degradation

Evaluating land degradation has evident benefits. The valuation of ecosystems is a new strategy and means of sourcing investments for ecosystem restoration (Nkonya et al. 2013; Berghöfer et al. 2016; Ramsar Convention on Wetlands 2018; Patra & Basu 2021; UNCCD 2022; WOCAT et al. 2022). For example, de Wit et al. (2012) provided evidence for the importance of adopting the cost-benefit analysis of ecosystems. To gain access to financial opportunities, values of ecosystems are inherently used as the most important criteria (Brandon et al. 2021). Thus, the economics and restoration interface in land degradation is the new currency. Additionally, knowledge of the cost of restoration actions versus inaction is fundamental in planning to reduce land degradation (ELD Initiative 2015a; Patra & Basu 2021; Polasky & Daily 2021). Moreover, restoration is a collective obligation for businesses, grassroot communities and governments due to shared interests and dependence on resources for the future (UNCCD 2022). Therefore, it becomes imperative to disseminate aspects of ecosystem cost and interventions as well as benefit calculations for policy development (de Groot et al. 2006; Giger et al. 2018; Patra & Basu 2021).

Globally, the lack of valuing ecosystem assets and incorporating this in policies is perceived as a key trigger of land degradation (Nkonya et al. 2011; ELD Initiative 2015b). After conducting a robust assessment of ecosystem services, both with value and non-value, there should be an establishment of policy instruments to bridge the gap (Nkonya et al. 2011). Favretto et al. (2016), Gichenje et al. (2019) and Salvia et al. (2021) highlighted that policy supports resource management through restrictions and rules that prevent overexploitation. A study by Favretto et al. (2016) further indicated that a policy is a system that facilitates conversion of valuation results into actual commercial benefits while assuring sustainable access. To accomplish compliance, local communities and their authorities are encouraged to

participate in developing and enacting such policies (Nkonya et al. 2011). Promoting multi-sectoral policy synergies ensures that the interface between alternative sources of income for social stability and sustainable land management practices are at par (Favretto et al. 2016).

2.6.4 Factors to be considered when adopting Economics of Land Degradation

Over the years, land degradation has become a worldwide concern (Nkonya et al. 2011; ELD Initiative & UNEP 2015; UNCCD 2022). Nonetheless, because ecosystem services are area-specific, valuing them should not be generalised. Thus, designing the process should strategically underpin the clarity of human-environment relations, how natural resources are utilised and perceived, as well as the ultimate impact in an area (Berghöfer et al. 2016; Giger et al. 2018). This is further magnified by the multifunctionality of the ecosystem (Balmford et al. 2002; de Groot et al. 2006) and stakeholders' understanding, hence it is possible to attach varying importance and value to a similar service (de Groot et al. 2006). This also calls for a consideration of several significant factors that are relevant to the success of the ELD approach (Nkonya et al. 2011; ELD Initiative 2015a).

2.6.5 The constraints of the Economics of Land Degradation approach

While the ELD methodology is well established and used by the international scientific community (e.g. Thevs et al. 2014; ELD Initiative 2015a, 2015b), it also faces some limitations. The cost-benefit analysis underpinned in ELD values natural resources with an economic benefit in focus, yet not all ecosystem services are monetary-based (Balmford et al. 2002; Nkonya et al. 2013; Brandon et al. 2021). However, such services still contribute to the natural capital, sustainable human well-being and are part of land management (ELD Initiative 2015a; ELD Initiative & UNEP 2015). Hence flexibility is required to opt for other suitable and complementary valuation methods, such as Multi-Criteria Decision Analysis (MCDA) (Favretto et al. 2016). Besides, lack of data, social will or expertise could be a setback, therefore it is a necessity to involve diverse stakeholder backgrounds in the evaluation process. As if that is not enough, sectoral engagement and methods can easily be off track. Thus, while the ELD methodology adopts multidisciplinary participation it also acknowledges the challenges. Training on the process of ELD is therefore important in promoting informed decision-making for sustainable land management (ELD Initiative 2015a).

3. METHODS

3.1 Study area description

Lesotho is a country fully surrounded by South Africa (SA). It is a sovereign country presently ruled by King Letsie III with 10 districts. Lesotho is divided into four agro-ecological zones based on vegetation and climatic conditions: the Senqu River Valley (SRV), mountains, lowlands, and foothills (Mukuku et al. 2004; Chatanga & Seleteng-Kose 2021). The Lets'eng-la-Letsie wetland (Fig. 4) is found in the Quthing District in the southern part of Lesotho. It lies at 2,400-2,820 m.a.s.l. in the deep valleys of the Maloti Drakensberg Mountain Range (Kahlolo et al. 2021). This region is the most arid in Lesotho, yet it harbours iconic and endemic plant species, such as the spiral aloe (*Aloe polyphylla* Pillans) (Mucina & Rutherford 2006).

Lets'eng-la-Letsie was designated as a Ramsar site in 2005, owing to its unique characteristics as per RAMSAR description (INR [Institute of Natural Resources] 2013; Kahlolo et al. 2021). This wetland drains water into the Mahlakeng River that collects headwaters further down into the Senqu River system, which in South Africa is called the Orange Senqu River (Matete 2006; Grundling et al. 2015; Chatanga & Seleteng-Kose 2021).

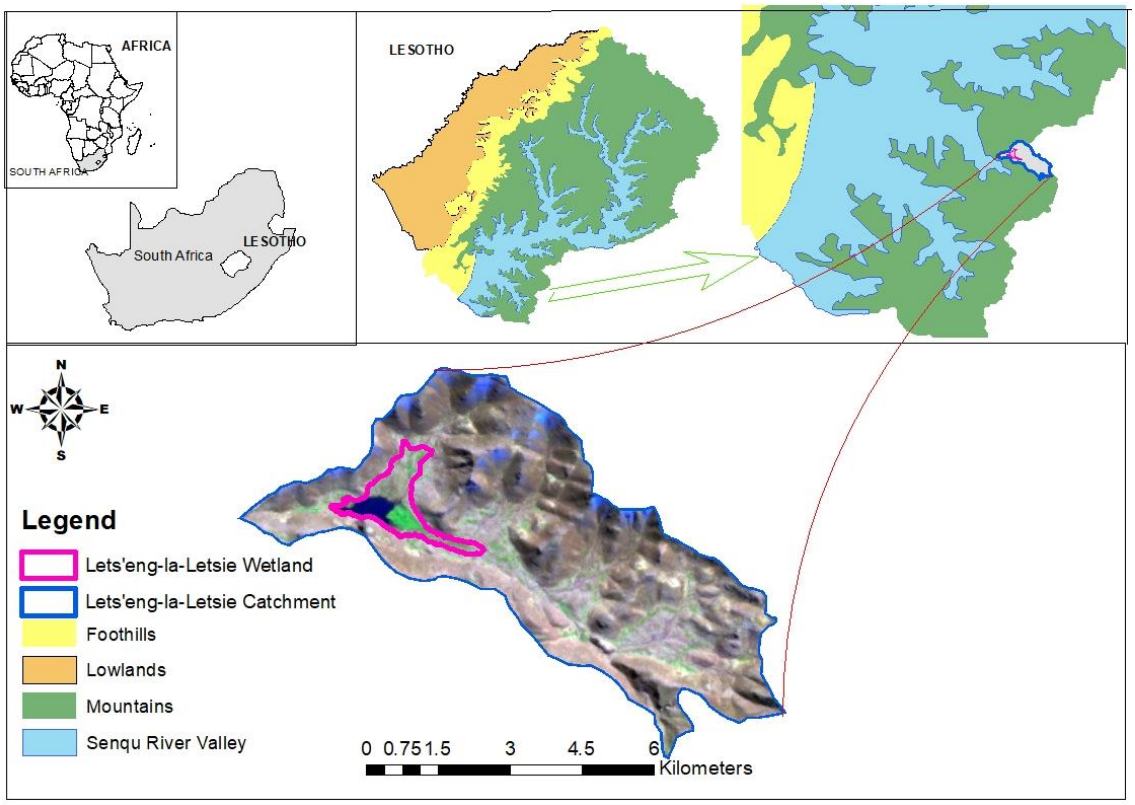

Figure 4. Map showing agro-ecological zones in Lesotho with the Lets'eng-la-Letsie wetland area. (Source: Produced by Retselisitsoe Stephen 2022).

The communities using the Lets'eng-la-Letsie wetland area are from the following three community councils: 1) Telle, 2) Mphaki and 3) Tosing. The people of these councils are predominately uneducated, unemployed, and dependent on local natural resources for earning a living (INR 2013). The climate in Lets'eng-la-Letsie is substantially seasonal with a temperature range from -5 to +27^{o}C in winter and summer respectively (LMS [Lesotho Meteorological Services] 2017). The area receives an average annual rainfall of 800 mm mostly in summer and more snowfall in winter (INR 2013; Kahlolo et al. 2021). Natural resources are spatially and heterogeneously distributed within the study area. This calls for variation in land use patterns based on societal disparities. Livestock grazing and cultivation are major land uses as in other parts of the country (INR 2013; Rahlao 2021).

Historically, the vegetation of Lets'eng-la-Letsie has been characterised by grasses, but the ecological transition is leading to a wooded grassland. The vegetation within the Lets'eng-la-Letsie catchment depicts a zonation of shrubs and herbaceous cover. Plant species diversity in the area has declined owing to overgrazing and has many implications for wetland health and functionality (Kahlolo et al. 2021). Moreover, invasive plants usually increase in abundance and density until dominating the rangeland after overgrazing. This is facilitated by their functional trait to be stronger competitors for resources than the grasses (Briske 2017; Rahlao 2021). The Lets'eng-la-Letsie catchment is founded on nutritious basaltic parent material. The

bedrock is distinguished by high cation exchange capacity (CEC)[4] (Kahlolo et al. 2021). The alluvial soils have high field capacity and are sensitive to erosion. Hence, this wetland area shows rill erosion, which is facilitated by regular livestock pathways that are evident in the area (INR 2013).

3.2 Research design

The study applied grounded theory in data collection and analysis. Grounded theory is an orderly approach that provides guidance and facilitates the establishment of data theories for analysis in qualitative research (Charmaz 2014). The study follows a narrative research method and triangulation, which means gathering data from various informants to avoid biases (Babbie 2001; Merriam & Tisdell 2016). This study aimed to identify and criticize loopholes in legal instruments (objective 1), outline and analyse how policymakers understand the state and value of wetlands (objective 2), map the resource pool (objective 3) and examine determination to explore the Economics of Land Degradation concept (objective 4) towards wetland management and sustainability in Lesotho (objective 4).

3.3 Data collection

The study's data collection involved primary and secondary data. The data were collected in July 2022 in Lesotho and in Iceland. Data collectors administered the surveys to a sample size of ten informants (Appendix I). Semi-structured interviews were used, built on three sets of pre-designed questionnaires (Appendix II, III and IV). Each interview started with a brief explanation of the study's background, purpose and the interview procedure including that it would be audio recorded. The informants' views were general institutional-based observations, and the recorded data was treated with caution so that it would not be misused. The informants can be described as group representatives, selected based on expertise or position (Babbie 2001). In this study, the informants were both knowledgeable about the research subject and occupied relevant positions to participate in the research. Because the study engaged with high-profile informants, it was in the interest of the researcher to ensure that the informants were protected. In addition, their freedom to decline participation at any time was explained. Consent was asked from the informants before the start of the interviews. These issues had been discussed beforehand with the data collectors who pledged to keep the oath.

3.3.1 Primary data

Two data collectors were strategically selected based on their knowledge and experience of wetlands and rangeland management in Lesotho. Online meetings were held with them to discuss the study's background and objectives, as well as how to go about collecting the data. The informants in the study were both representatives of governmental and non-governmental organisations (NGOs) with a wetland protection mandate in Lesotho. Most of the informants were decision-makers, chosen because of their prominence and being in the frontline in natural resources' sustainability. The seven government informants held senior managerial positions in the following institutions: The Ministry of Forestry, Range and Soil Conservation (MFRSC), Ministry of Tourism, Environment and Culture (MTEC), and Ministry of Water (MW).

[4] Cation exchange capacity refers to ability of soil to retain essential nutrition content.

because the ELD framework consists of multi-stakeholder involvement, one staff member each from the following NGOs were also interviewed: The Lesotho Highlands Development Authority (LHDA), the ReNoka- Integrated Catchment Management (ICM). Lastly, the study drew on insights from the ELD Initiative representative on what adopting the concept entails for Lesotho in terms of expectations and obligations (objective 3). It is acknowledged that there are many other stakeholders involved in wetland management issues who were excluded in this study due to time and financial constraints.

Three sets of questionnaires with both open-ended and closed questions were designed and tested prior to administering (Appendices II-IV). Furthermore, a representative from the ELD Initiative was personally interviewed by the researcher via an online platform to gather more information on the ELD framework and its feasibility in Lesotho. The audio recorded responses from the interviewees in Lesotho were sent to the researcher in Iceland for analysis.

3.3.2 Secondary data

Literature in academic publications, journal articles, reports, books, and Lesotho legal instruments provided secondary data. This included literature on land use, supplied ecosystem services and classification of beneficiaries. Moreover, literature on the policies and laws governing water resources in Lesotho as well as ELD case studies from around the world were perused.

3.3.3 Limitations of the study

By virtue of their work responsibilities, the informants of the study were subject to tight schedules and commitments. It was therefore not easy to adhere to the planned data collection schedule and there had to be some postponements. It was beyond the scope of this study to interview many other stakeholders interested or affected by wetland sustainability whose views would have been relevant to the study and might have given additional perspectives. To some extent, it is probable that during some interviews the interviewer might have missed to ask follow-up questions that would otherwise have provided more insights. Despite these limitations, it is assumed that the findings of the study remained relevant in addressing the objectives of the study.

3.4 Data analysis

Thematic data analysis was adopted because it observes the grounded theory of analysis. This theory comprises non-linearity, descriptive, reflective, comparative usage of analytic codes and interconnections in the data analysis (Hennink et al. 2011; Charmaz 2014).

3.4.1 Data transcription

The recorded audio data was transcribed verbatim from a voice recorder. This method is claimed to be the best in preserving the originality of the interview which is critical for data analysis (Merriam & Tisdell 2016). This was to ensure that the researcher connected and got accustomed to the datasets which was helpful in the next analysis step.

3.4.2 Thematic coding

Codes are clear common concepts of the data gathered during data transcribing (Babbie 2001; Hennink et al. 2011). Thematic codes were designed after the datasets were transcribed. The open-ended questions were then assigned codes before analysis. This stage involves delving into and finding relevant data through noting data similarity, variation in data themes, creating sub-themes and modifying or re-categorising themes. Coding is completed with the study objectives in mind, and it should be ensured that data bias is minimised.

4. RESULTS

This section presents the findings from the interview sessions conducted in Lesotho and online from Iceland regarding the proposal of the Economics of Land Degradation framework for wetland sustainability in Lesotho. Briefly, the study sought to 1) understand disparities in policies on wetland protection in Lesotho, 2) establish a rationale for adopting the economics of land degradation framework, 3) predict the way forward, and 4) test the will power of policymakers regarding wetland management in Lesotho. The results are generalised and supported by direct italicised quotes from interviews to give data emphasis. However, for confidentiality the names of the informants are not provided with the quotes.

4.1 Management of wetlands in Lesotho

In Lesotho, wetlands are a crosscutting resource that involves everyone. However, there is no integrative planning and implementation for managing wetlands in the country. Institutional arrangement has been a major challenge in water management because of fragmented activities from different institutions. This also includes policy issues where policies probably have good strategies and tools yet do not speak to each other. Some policies are not sufficiently deterrent in fines for wetland violation, while others have an overlapping conflict. One informant remarked:

> *Our legalisation addresses some of the common issues differently. There is no coordination, everyone is doing their thing in their corner, the silo approach. If we can work together and collaborate, then we can achieve a lot.*

Culturally, the perception that Lesotho is richly endowed with water resource might have encouraged leaders into thinking that it is not necessary to invest in wetlands. They tend to rather redirect the available investment benefits into other things than wetlands management because of the presumed abundance of water resources. As one informant proclaimed:

> *That is very wrong because we experienced drought in 2015, where many places did not have water. It had to be tankard from other places because wetlands were not in good condition to function, even in drought. In the past, even when we used to have such condition for a year or two, wetlands used to withstand this and still be strong enough to supply water even under drought season. But now when it is dry, the wetlands also just go dry. That tells us that we are going into a wrong direction, and we need to do something regarding protection, conservation, and rehabilitation of wetlands.*

4.1.1 Strategies, initiatives, and their effectiveness

The informants had varying opinions regarding what has been done to curb wetland and rangeland degradation. Many initiatives have been undertaken by different institutions individually. Initiatives such as brush control have been the leading interventions in land restoration. This is common in both governmental and independent parastatals, including the Lesotho Highlands Development Authority (LHDA). The Government of Lesotho (GoL), through MFRSC, had a Famine Relief Project that was based on land restoration while mitigating poverty and improving livelihoods. One informant stated:

> *The MFRSC has a lot of activities targeted at rehabilitation of rangelands and alleviating poverty. However, we still need other ministries to fully function. Working together is a problem that, in my view, we are slowly trying to overcome.*

Another strategy to restore wetlands is through rangeland management-related initiatives such as forming grazing associations and developing grazing management plans. These are done in cooperation with livestock owners and herders. In some areas, wetlands are under the management of grazing associations as part of the interventions. However, some communities are resistant, while others are receptive. As one informant explained:

> *In Mokhotlong, we have been able to demonstrate to grazing associations the importance of brush control and how it helps in restoring the wetlands. Then from seeing the impacts we see growing interest of associations and we are developing more of them. They are really motivated because of the results that they have seen on the ground. We have some examples of areas that rehabilitation has been so good that we are now harvesting grass seeds and reseeding in other areas. So, there has been a lot of success in that regard*.

Some wetlands were earmarked for monitoring of the impact of the construction of dams on wetlands. During monitoring, it was realised that the condition of the wetlands is deteriorating. Therefore, a conservation strategy and monitoring plan was developed. This tool talks about the conservation of wetlands for water delivery and rehabilitation of wetlands as most of them are highly degraded. As one informant indicated:

> *In terms of addressing issues of wetland conservation, we are in the process of establishing protected areas. Also, we are into the rehabilitation activities, both brush control as well construction of physical structures. Another important thing we considered was to engage the people who use the wetlands and established alternative livelihoods to reduce their reliance on the wetlands and focus on other income generating activities.*

In addition, there is the Range management bill of 2021, which is pending approval in the parliament of Lesotho. Again, the Soil and Water Conservation policy of 2021 is in place, and it specifically acknowledges the economics of land degradation. Other than that, the National University of Lesotho offers undergraduate and postgraduate programmes in support of the ministerial efforts.

In contrast, other informants stated that there has not been much positive net effect because of failure to learn from the experience from restored areas before rolling out adaptation and

adoption in the new areas. The lack of a positive net effects is also attributed to a lack of technical capacity in wetland management. As one informant emphasised:

> *We lack capacity in terms of the characterisation of wetlands because they have different characteristics, behaviour, and soil types. This is important, so that when we develop a wetland restoration strategy, we know all the important factors for different wetlands.*

Additionally, the GoL has limited resources to maintain these investments which are basically parts of donor-funded projects. There is usually improvement during the project life cycle because then project's principles are followed and adhered to. Unfortunately, this effect is not observed or experienced beyond the project time. That is, wetland management becomes good only when the project is ongoing. Wetland sustainability is a problem, as another informant noted:

> *Initiatives collapse beyond project life. I am not sure whether it is because during the project we do not build enough stakeholder knowledge and understanding on the imperativeness of wetlands such that communities using such wetlands can take the responsibility of protecting these wetlands by themselves.*

4.1.2 Integrated planning for wetlands in Lesotho

Another purpose of the study was to evaluate the political will with respect to wetlands conservation and protection. The informants shared similar sentiments of striving for a unified approach to wetland management. There has been an initiative to improve management of wetlands in Lesotho through the ReNoka programme. It is an integrated catchment management (ICM) project that has adopted holistic planning and implementation. Bringing all stakeholders together with their varying policies was a predictable challenge. Hence the proposed and completed strategy to harmonise all policies governing the environmental activities, including wetlands management. This was a remediation strategy to address existing fragmentation of legal instruments. As one informant stated:

> *We are generally trying. We have asked our king Letsie III to become a champion of ReNoka programme which follows integration of professions and stakeholders, including farmers and herders. The ICM coordination unit has been established but not yet legalised, hence it cannot be fully operated, but it is underway.*

Integrated water resources management (IWRM) seems to be the dominant approach and well received by stakeholder institutions. It stems from various institutional expertise that have made a critical contribution to wetland management. The support is diverse in terms of technical and financial aspects. Other informants indicated that partnerships are part of their brand, as one of them clarified:

> *Yes, we are for collaborations with government departments, learning institutions in and outside Lesotho as well as communities. We are open for collaborations.*

In support of wetland management, another informant stressed that:

> *In my leadership capacity I can work with everyone to ensure the success of rehabilitation projects. It will be my pleasure to educate communities and lead*

> *them to understanding. All these rehabilitated areas should be used as study tours to increase awareness and I will continue participating in such strategies.*

It seems that decisionmakers have normalised taking too much personal pride in their work to the extent that when a person is assigned responsibility in office, it becomes a personal objective rather than a collective effort. This issue is a challenge to rehabilitation initiatives. However, an informant assured that there is political will now unlike in the past. For instance, King Letsie III and the Honourable Prime Minister are supportive, and all the involved ministers and partners have signed a partnership declaration towards sustainability. The declaration articulates how each will play their role. One informant expressed the view that:

> *Maybe this could be legalised so that relevant ministries are frequently reminded of what they signed up for in land restoration and development of Basotho as a nation.*

A respondent further quoted the declaration that reads:

> *We believe that benefits of integrated catchment management in Lesotho for todays and future generations can only be achieved through coordinated action and cooperation that empower and support partnerships between all stakeholders. The integrated, sustainable, and risk-informed management of Lesotho's catchment areas will lead to the conservation of biodiversity, land, and water resources and advance climate resilience. It will contribute to improved urban and rural livelihoods, water quality and economic development in the country, the Orange-Senqu basin and the entire southern African region*."

4.2 Importance and value of wetlands

The informants were asked to summarise the importance of wetlands. They explained wetland as a diamond treasure to Lesotho and described Lesotho as a water tower of the southern African region. It was described that wetlands harbour biodiversity, provide grazing for livestock, and sustain life. Wetlands have an important role in regulating climate through carbon sequestration, purifying water, and climate change adaptation, such as flood control. The wetland ecosystem buffers erosion and increases crop yield, thereby contributing to food security in the country. As one interviewee summarised:

> *Lesotho depends entirely on livestock rearing through the wool and mohair industry, and these livestock find grazing from rangelands. Thus, when our rangelands and wetland are properly managed, livelihoods of Basotho will be improved.*

In Lesotho, wetlands are sources of water that drain into river systems and catchment dams. These dams are constructed not only for water collection but also for fisheries, ecotourism activities and improvement of livelihoods. These activities have also contributed to employment creation that in return boosts the economy. Thus, they are important for economic development for the country through the water transfer schemes. As another informant stated:

> *For Lesotho Highlands Development Authority, the mandate is to develop and transfer water to the industrial hub of South Africa. So, for that the project is*

> *sustained by Lesotho highland wetlands. Also, their importance has been to sustain the project in terms of water availability and sustaining the communities around Lesotho Highlands Water Project (LHWP). The water from wetlands is used to generate electricity for Lesotho*.

While the population enjoys the benefits of wetlands, it is acknowledged by another informant that:

> *We need to teach young people to love their country and how rangelands are important for various purposes. We do not have any other country other than Lesotho. We need to increase awareness to the public to avoid misusing natural resources which implies lack of water supply by wetlands. That means even the benefits that come from selling water to South Africa will end.*

Another informant summarised the importance of wetlands by saying wetlands supply water, and water is life. That informant claimed:

> *The value of wetlands cannot necessarily be overemphasised because they are valuable in and outside the country, I mean the Orange-Senqu River Commission.*

4.2.1 Threats to wetland ecosystems in Lesotho

It is acknowledged that wetlands are facing threats that compromise their capacity to support livelihoods despite being valuable. Mismanagement of rangeland was commonly mentioned to be a major challenge to wetland sustainability. Traditional practices were also implicated for overexploitation of wetland resources, particularly overgrazing and several other factors that threaten ecological functioning. For instance, herders establish cattle-post huts[5] near wetlands that damage the wetland structure. After implementing rehabilitation measures, the plan is to defer or exclude wetland areas from grazing. However, some herders still put their livestock there. Livestock grazing and trampling causes runoff deposition in the wetlands and ultimately destroys the spongy feature of wetlands. Climate change and the construction of infrastructure, e.g., roads upstream, also negatively impact natural ecosystems. One informant claimed:

> *The challenges are many, but one can summarise them into the mismanagement of rangelands because most of our wetlands are found/situated within the rangeland ecosystem and if the rangeland is mismanaged in different forms, it affects the wetlands.*

In explaining the challenges facing wetland management, another informant emphasised:

> *…lack of law enforcement. The local authorities were restricted in their duty because the charges of the old law were too low, such that farmers would purposely take their livestock into wetlands because they could easily pay the fines. However, … I have pushed for a new Range Management bill of 2021 that will resolve these issues with quite deterring charges for violations. This will enhance wetland protection and range management in Lesotho.*

[5] Cattle-post hut is a place where herders stay or live during transhumance.

Erosion is accelerated by the steep topography in the highlands from which water flows. Moreover, eroded and drained wetlands are damaged by burrowing rats (ice rats) which eat the grassroot system, leaving the wetlands bare and vulnerable to degradation. Wetlands develop erosion features such as gullies that create paths for fast water discharge; water that would otherwise be retained in wetlands and slowly seep into the streams. Another informant stated:

> *In my talk with someone, he said, "if as a country we do not tackle or curb land degradation including wetlands, Lesotho will soon be one big rock". This is evident by newly emerging business on rock mining at Lekokoaneng due to lack of plant cover hence erosion. This brings issues of floods. If you go to the highlands, you will see the constant "coffee" [i.e., erosion water] that is running into the Katse dam. I can bet that at that rate, if the lifespan of Katse dam was thirty years, it is going to be run short of 10 years because of that siltation.*

There are tourism issues related to the mountainous landscape that attracts sport, such as the motor bike event called the Roof of Africa. It is acknowledged that the event organisers are careful about not running through wetlands, but still tourism threatens wetlands because there is no policy protecting wetlands. Unfortunately, the same mountains also have diamonds. This creates conflict of interest between two important economic factors in the country, mining and wetlands. Sadly, diamonds are measured by the Gross Domestic Product (GDP) value and in the market, but water is not. Diamond mining may not last forever but if wetlands are destroyed and dry up, human life is at risk. One informant stated that:

> *I am telling you that if we do not weigh the two sectors [the mining and water sector] very well, we are bound to lose both forever at one point in time. We do not need diamonds to live, but we need water to live. We need diamonds to do other things, but it is not a primary requirement for sustenance of both animal and human-beings.*

Wetland policy brought different views. One group advocated policy formulation while another discouraged it. The first group reported a dire need to have a wetland policy although it was very sceptical about its implementation. Over the years, Lesotho has been known to be good at planning but also a failure at execution and enforcement. In many of the legal acts or frameworks the strategies are clearly stipulated, but the reality on the ground is something different. This was explained as being due to lack of vision, as one informant contended:

> *We do not just need a policy, because in this country I have seen a lot of policies but not necessarily having the capacity of enforcement.*

Another group that opposed the proposal to have a wetland conservation and protection policy, as one in that group stated:

> *It is difficult to have a specific wetland protection policy, because of the interconnectedness of the ministries that have various mandates on wetlands at different levels, e.g., the Department of Range Resources Management, Department of Water Affairs Local government, Agriculture, Environment, Lesotho Mounted Police Services, and Lesotho Defence Force. They all have a stake in wetlands which emanates from the constitutional law. The current Range Management bill of 2021 has repealed some of the old sections within other institutions' laws*.

It was also revealed that the ReNoka programme is ahead by synchronising all the relevant stakeholders' policies pertaining to wetland protection. This was referenced by other informants who stated that, that after the ReNoka's initiative, there was no need for more efforts. One informant asserted:

> *I think it is one of the components under the ReNoka programme. But what is more important is, what is it going to entail? How are we going to ensure that it is not just a document but that it is implementable. Those are the things.*

4.2.2 The importance of valuing wetland ecosystem services in Lesotho

To find the solution to wetland degradation, the informants were asked to predict the implications of carrying on with business-as-usual for wetland management and their services. It was indicated that the cost of inaction, or failing to reverse degradation, is clearly high. Thus, the old habits will be disastrous to the country's economic growth and human life. The cost of business-as-usual mentality is very steep compared to the cost of restoration. Time is running out and if we do not restore them now and limit wetland degradation, the condition will soon become irreversible, as was emphasised by an informant:

> *Business as usual has already failed and I think we have already wakened to the reality that it will not take us anywhere instead it is pushing us to our detriment.*

Another reason mentioned for the need to value wetland ecosystems was that infrastructure, especially catchment dams, will become useless. The dams will not be able to collect water at the intended capacity, thereby risking the SA water transfer agreement. One informant indicated that:

> *The hydrological data in Lesotho's river systems shows a fast decline due to degradation of the wetlands. Biodiversity in the wetlands and the services they provide are also decreasing rapidly.*

Conducting a cost-benefit analysis for natural capital accounting would help to communicate the value of wetland ecosystems in a language that politicians will understand. As one informant asserted:

> *If we do not bite the bullet now, be strategic, focus and forego some of the things that seems to be good but transient in their benefit, I think we are going to lose all. In less than 40 years we will have no land due to erosion. Governance depends on revenue form the Lesotho highlands. It is a hot debated topic, but no one is making the link to the health of wetlands. So valuing the ecosystems will appreciate these systems by attaching an economic value. This will help to convince our authorities and politicians and be able to relate the whole chain of benefits.*

4.2.3 Probing the future of wetlands

In building an argument for the valuing of wetland ecosystem in the future, informants were asked to describe their vision for wetlands. The policymakers are in one accord that, due to intrinsic value of wetlands: wetland areas should be holistically managed, including rangelands and catchment areas. It was reported that restoration can be accomplished by

addressing livestock grazing in wetland areas and getting the buy-in of local communities using wetland areas and their local authorities (chiefs and community councillors). The informants also outlined a strong desire to include restoration in the school curriculum to encourage sustainable land management. One informant stated:

> *I envision Lesotho with very healthy, productive and expanding wetlands. Not degrading as we see them now.*

The importance of enacting the new Range Management Bill of 2021 to curb mismanagement of rangeland and wetlands was emphasised, as they are part of the rangeland resources. As this informant proudly mentioned:

> *Unlike other laws, … impoundment fees for violating rangeland management issues should have a separate schedule which enables the minister in office to annually adjust regulations upon realising that the charges are still low. The people are used to them and are not deterred from violating the law. All protected wetlands will automatically be gazetted, and the law can apply on wrong doers. This is a great achievement because it takes 10 to 20 years to amend the law in Lesotho.*

To test if the informants were maybe over-ambitious, they were asked to comment on the feasibility of their vision in a follow-up question. One informant said:

> *We know we cannot save everything, but we should at least have some wetlands where we completely exclude livestock grazing. We already know the wetlands that are important for water delivery for the Lesotho highlands, for example. And if we can protect those and exclude grazing then we can achieve some form of wetland restoration. We also should increase the wetland area to 50% of our area under protection and use the Lesotho Defence Force army to ensure protection.*

Another informant offered a different opinion:

> *The most important issue before any vision is to change the mindset of the public. I have learnt doing that is better than using enforcement, although sometimes it is needed, but educating the community that use these wetlands about development is of great importance because they can do that even on their own under minimal supervision by the MFRSC. Therefore, as we have already embarked on this in many areas, I am convinced that when these communities manage and protect the wetlands, it becomes better and improves wetland condition within about three years.*

Another informant emphasised that:

> *We must be careful of the challenges that we see, initiatives are there but we do not have an annual water audit report. There is investment also from GEF dedicated for developing natural capital accounting and the political will to elevate the issue of wetland degradation and prioritise them as required.*

4.3 Mapping the future of wetlands in Lesotho with respect to global trends

Different countries are trying to meet the obligations of the signed and adopted treaties and commitments. It was in this regard that an ELD representative was consulted for insights around the subject of economics of land degradation. The representative elaborated that there are definitely opportunities for carrying out the Economics of Land Degradation approach as this provides fundamental information towards agreements on sustainable land management, such as the LDN targets. There is a current trend of national accounts of ecosystem services which is connected to the SDGs. This type of international interest shall be discussed again under the United Nations Decade of Ecosystem Restoration, and this requires economic value assessment using cost-benefit analysis. This justifies the relevance of considering conducting an ELD study in Lesotho if the country is to comply with the national LDN target by 2030. An informant stressed:

> *There should be interest in Lesotho for doing this kind of thing which is why we think these studies are valuable. When you start talking about the economics of it, then that brings people from the different sectors of different ministries together. We are also hoping to get investments from either the public sector or the private sector.*

It was said that Lesotho should be prepared to face challenges along this journey in getting needed resources. For example, because the finance economists are neither agri-economists nor biologists, they perceive farming as being unprofitable. Hence it is not easy to bring them on board. Moreover, the need to bring together people from different sectors, e.g., NGOs, government, academia, and local beneficiaries of ecosystem services, is difficult. However, linking local people and the immediate benefits in terms of better productivity that then scales to the national government (GDP from environment and agriculture) can be used as an example of the net benefits of investing in sustainable land management. For example:

> *One of the big concerns is that usually there should be an upfront investment to implement new projects. Unfortunately, that cost is not usually afforded by local farmers, but then you can show that the investment is worthy by doing the cost-benefit analysis.*

The cost-benefit analysis for land resources usually comes out very valuable in terms of the interventions local people usually suggest. This is why local people should participate, according to the ELD ideology, rather than have solutions imposed on them from above. Of course, that is the old top-down way but it does not give long-term results because it only works during the time of the project which is often only three to five years. As an informant highlighted:

> *In ELD, we want something that is developed by people, the buy-in from local people so that it continues after the project ends.*

5. DISCUSSION

This segment of the study now brings forth integration and regrouping of themes as well as interpretation to build the knowledge base. The observations discussed are in the context of Lesotho as per the objectives of the study on legal instruments, understanding of the condition

and value of wetlands, and the aptness and preparedness of adopting the Economics of Land Degradation framework for sustainability. However, arguments are supported by drawing insights from previous studies that followed a similar approach.

5.1 Managing wetlands in Lesotho

The information gathered indicated that the MFRSC continues to reverse rangeland degradation in which wetlands are included. Lesotho rangelands are heavily invaded, overgrazed and eroded (Mukuku et al. 2004; Kahlolo et al. 2021; Rahlao 2021). It is believed that wetland challenges emanate from the rangelands, hence tackling rangeland problems also contributes to wetland health. Interventions involve hiring local communities to establish physical structures and uprooting undesirable plant species. This improves local people's livelihoods and reduces dependence on rangeland resources (Chatanga & Seleteng-Kose 2021). Developing local management structures, such as grazing associations, has also been advised. However, awareness needs to be intensified among communities, especially herders. Pacheco et al. (2018) highlighted that communities are responsible for the management of resources and are key players in LDN. This shows that the GoL is not entirely on business-as-usual mode but is applying efforts in curbing wetland degradation and engaging the local people.

The information gathered indicated, however, that there are still gaps in wetland protection and conservation. These are summarised as limited technical knowledge, lack of resources, fragmentated policy framework, and individualism among major stakeholders in wetland management. The informants revealed that within their individual institutions there is a specific knowledge base that may be lacking in other institutions. Moreover, institutions are usually planning and implementing independently based on their mandate. Furthermore, Lesotho is a developing country and it is common for developments to be hindered by scarcity of resources, particularly financial resources. Lesotho politicians are compelled to overlook the crisis of wetland degradation and instead divert and fill gaps in other sectors with the benefits from water transfers between Lesotho and other countries (Mokhethi & Kabi 2021). Another possible factor that contributes to this skewed decision making among politicians is a lack of understanding and linking of the water rewards for Lesotho and the actual water sources. The missing connection is also highlighted by the ELD Initiative (2015a). All these factors individually and collectively lead to challenges for wetland sustainability in Lesotho.

The lack of laws that support and speak to current challenges seems to imply a general reluctance towards achieving sustainability. However, many of the respondents expressed a hope that enactment of the new Range Management Bill of 2021 will enforce administration and prevent overexploitation of rangeland resources, including wetlands and wetland areas. This should be supplemented by adopting new strategies in land management as well as exploring management interventions, for instance, the valuing of ecosystems to contribute to natural capital and establishing a water account for the country or a water audit report. Nevertheless, this management shortcoming has now been rectified by unifying all relevant policies from various stakeholders by the ReNoka programme (ReNoka 2021). This is a great achievement for Lesotho regarding wetland management and sustainability through an integrated water resources management approach. It also addresses the lack of coordination of interventions that can become problematic when funded projects phase out. Similarly, the relevance of policy synchronisation was greatly recognised across all sectors in the interviews as a long-awaited solution to policy disintegration. This becomes a multi-faceted benefit, not only considering wetland management, but also for accomplishing Lesotho's LDN target to

improve land by 5% and Target 3 of the SDG 15. This addresses the issue of sustainable land management by decreasing land degradation and is supported by Giger et al. (2018) and Hussein et al. (2021), who found that the gains for land users are greater from implementing restoration projects.

5.2 The importance, value, threats, and remedies for wetlands ecosystem in Lesotho

It has been illustrated by the study that wetlands are valuable. The informants remarked that wetlands are environmentally, economically, and socially important both in Lesotho and outside its borders. The inherent value of wetland ecosystems is a basis for food supply through the provision of agricultural products. Despite their importance, wetlands in Lesotho are faced with a mountain of challenges, specifically human-induced influences (Chatanga & Seleteng-Kose 2021). The informants agreed that management of rangelands is inadequate, and it is the umbrella of many threats to wetlands. It was learnt that the same management tool can turn to be a problem if not well structured. This is exaggerated by the poor law systems in place to administer wetland resources (Chatanga & Seleteng-Kose 2021). Similarly, as resourceful as the country is in terms of water supply, in the end a lack of coordination and balance between interests creates major compromises A typical example is between mining and wetland management. These are both economical resources and yet their intrinsic value is seen as one-sided in favour of mining. Land use conflicts have been shown to fuel degradation and, depending on their severity, may cause further negative impacts on ecosystems (Pacheco et al. 2018).

The informants had different opinions regarding development of a wetland policy. Although there were proponents, the question of practice and enforcement still remains unanswered. This is an indirect indication that it does not help for Lesotho to develop tools that do not contribute towards wetland sustainability. Moreover, as opponents stated, it is not easy to create a specific policy based on the current broad institutional management of wetlands with different mandates. Instead, a radical change of mindset among leaders of institutions and policymakers is a core necessity to enable them to become united for the benefit of Lesotho and the Basotho (the people living in Lesotho). This view is backed up by the ReNoka programme in Lesotho that is envisaged to bring on this change and which underpins the integration of multisectoral policies in wetland management. This is further affirmed by the partnership declaration that has been adopted by policymakers towards holistic resource planning and implementation in sustainable land management.

5.3 Mapping challenges and opportunities to adopt the ELD framework for wetland sustainability in Lesotho

Lesotho policymakers are faced with the reality of wetland degradation. This issue is getting more serious relative to the importance and value of wetlands. It is found from informants' opinions that they envision well-functioning wetlands. They suggested not only the vision but also strategies to achieve restored wetlands. These include teaching the public and scholars about land management and sustainability, following rotational grazing and engaging security institutions for law enforcement, particularly the new law that is yet to be enacted. The National University of Lesotho is already engaged in increasing the knowledge capacity through educational programmes. This type of teamwork is applaudable and accepted in ELD methodology that requires everyone on board (ELD Initiative 2015a; Brandon et al. 2021).

Policymakers have made commitments through pledging for sustainable land management. It is suggested by the ELD Initiative (2015b) that government leaders will have to make courageous decisions to balance economic gains for both current and future human wellbeing. This will power seems strong and it is hopeful that it will be honoured by action. There is an initiative in Lesotho to build a natural capital account although at a broader spectrum it is the first of its kind in the country. However, such strategies are seemingly a promise to the future of natural resources management and sustainability in Lesotho, including the wetlands. These initiatives have a positive implication for the adoption of the concept of ELD because there are already plans in the pipeline to build natural capital. Other countries, including Namibia (Birch et al. 2016), Rwanda (Lal et al. 2020) and Somalia (Hussein et al. 2021), have undertaken studies to prove that valuing ecosystem services also improves socio-economic benefits.

It was discovered that there are merits attached to adopting the ELD framework, particularly following country commitments to achieve goals in sustainable land management. As already stated, Lesotho is planning to undertake a national natural accounting. It is possible for the adoption of the ELD framework to accomplish this. It will set the country on a positive course with increased scores on sustainability and thereby placing it at a position to stand a chance to attract investments for restoration projects (ELD Initiative 2015b). Nonetheless, it was also revealed that Lesotho needs to be prepared to deal with the challenges that the framework entails. These include a broad spectrum of professions and local communities working together as a team (Nkonya et al. 2013; Brandon et al. 2021). It implies possible conflicts of interest that may delay certain processes, although in the end, it is a commendable journey to take. Among these challenges is also financial support but Lesotho seems to be ahead as financing has already been approved for the activity. Thus, the methodological and inclusion strategies is what should be the main concern.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Land degradation is a worldwide challenge hijacking the provision of valuable ecosystems services for sustainable human life. To reduce the societal and ecosystem impacts of land degradation, appropriate methods, knowledge and political will is needed, including spending funds to restore and protect ecosystems. Wetlands in Lesotho, including Lets'eng-la-Letsie, have been deemed degraded owing to mainly human but also climatic pressures. In this study, the possibility of implementing the Economics of Land Degradation concept in Lesotho was mapped in line with synchronised wetland policies dealing with wetland protection and restoration. The study has set a baseline for adopting the Economics of Land Degradation methodology (cost-benefit analysis) in sustainable land management for the development of the economy and consistent supply of ecosystems services in Lesotho. This will be important for the country's future plans to develop a natural resource account.

The study mapped the linkages and trade-offs between valuing and opportunities of stocktaking of natural resources against land degradation inaction ramifications. A critical question to Lesotho is if the wetland area Lets'eng-la-Letsie should still be considered a Ramsar site following the huge degradation that compromises the selection criteria. Addressing degradation is thus an urgent concern in Lesotho and the study revealed positive will power among the respondents in this regard. Following a fundamental change in

management approach for water resources, that is, integrated water resources management (IWRM), the expectations of the researcher and the informants are high for enhanced livelihood prospects for the natural resource-dependent communities in Lesotho.

Valuing ecosystem services will help Lesotho to bridge the existing science-policy interface gap that hinders the restoration and resilience of ecosystems as well as achieving sustainable development. The advantages of restoring ecosystems are clear. Ecosystem restoration offsets land degradation and accelerates holistic human well-being. This is because land restoration enhances supply and delivery of ecosystem services for sustainability. In Lesotho, ecological restoration improves agricultural productivity, livelihoods and contributes to economic development. Hence the economic valuation of land resources as a solution-based approach involves all partners in planning and implementation. Natural valuation is critical and beneficial in influencing management priorities and governance, attracting funds for ecological projects, and substantially limiting negative impacts of degradation. Restoration interventions further facilitate ecosystem resilience, adaptation by people and accomplishing international commitments to improve the integrity of native ecosystems. Therefore, the study provides valuable input into Lesotho's efforts to achieve the SDG goals and LDN targets, and it will hopefully also help increase policy makers' awareness of the benefits of action against land degradation in Lesotho. Finally, an intervention strategy (Fig. 5), adopted from the ELD framework (Fig. 3), is proposed for the Lets'eng-la-Letsie wetland.

Figure 5. Proposed intervention strategy for the ELD framework for Lets'eng-la-Letsie in Lesotho.

6.2 Recommendations

In the light of the findings of the study, the following recommendations are made:

1. There is a need to increase awareness and capacity of the herders, other land users, local authorities and policymakers of the importance, value, and management of wetlands. This includes technical knowledge.

2. Local wetland management should be intensified nationwide, incorporating indigenous knowledge.

3. The ELD framework should be adopted at national and local level in resource management.

4. The study is a call to action for relevant stakeholder institutions to serve with the spirit of solidarity and to be mindful of the impoverished communities that rely on their decisions, without alternatives for enhanced livelihoods.

5. The study urges Lesotho politicians to solve the persisting mining and water resources management overlap so that there is a mutual and sustainable coexistence.

6. Lesotho should develop an annual water audit report. This will allow Lesotho to timely review water transfer treaties based on inflation and/or current market prices to accommodate the cost of wetland restoration.

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APPENDICES

Appendix I. Categorisation of the informants' organisations

Organisation type	Institution
Governmental	Ministry of Forestry, Range and Soil Conservation
	Ministry of Tourism, Environment and Culture
	Ministry of Water (https://www.water.org.ls/)
Non-Governmental	Lesotho Highlands Development Authority (LHDA) (lhwp@lhda.org.ls)
	ReNoka-Integrated Catchment Management (ICM) (https://renoka.org)
	Economics of Land Degradation

Appendix II: Interview frame for Governmental institutions

1. Identity (Name, Gender, Capacity and institution)
2. Summarise importance and value of wetlands
3. What threatens wetlands (challenges)?
4. Your vision regarding wetland restoration?
5. What are the gaps on wetland protection and conservation?
6. Any governmental initiatives to curb wetland degradation?
7. How effective have interventions been?
8. Thinking long term, do you think the costs of restoration interventions is greater or less than the costs of inaction and continued wetland degradation? Please explain.
9. How do you think carrying on with business as usual/ less commitment regarding land and water resources management will affect supply of wetland ecosystem services in the near future?
10. Do you think valuing (conducting cost and benefit analysis) wetlands will influence you to push for a wetland protection and conservation policy?
    If NO, why?
    If YES, how will you facilitate the assessment and valuing of wetlands? Please give an argument for your answer (***Select all that apply and give an argument/ reason for your answer***
    a) Advocate/ support/ mobilise funding wetland valuation
    b) Facilitate design and adoption of wetland ecosystem services in policy
    c) Enforce implementation
    d) Other (specify)_____
11. What is your view about having a wetland protection and restoration policy?
12. Are you willing to create partnerships with other stakeholders towards developing a wetland protection and conservation policy?
    If YES, please explain how?
    If NO, explain why?
13. Is there anything you would like to add/ share regarding this study? **(Ideas or reference material)**

END,
THANK YOU FOR YOUR PARTICIPATION!

Appendix III: Interview frame for non-Governmental institutions

1. Identity (name, gender, capacity, and institution)
2. Summarise importance and value of wetlands
3. What threatens wetlands (challenges)?
4. What is your vision regarding wetland restoration?
5. What are the gaps on wetland protection and conservation?
6. Are there any responsibility clashes in legal instruments regarding wetland protection and conservation? Please explain?
7. Are there any governmental initiatives to curb wetland degradation (who does what)?
8. How effective have interventions been?
9. The state of water resources 2016/2017 states that "*Management of wetlands should be enhanced to ensure availability of water for extended period of time*". Please give an update on progress
10. Water resource management policy states, "*Wetlands should be treated as restricted areas, anybody using them for any purpose which will eventually destroy them, will be penalized severely and revenue collected be used as incentives for those (herd boys or farmers patrolling the wetlands)*" Please give an update on progress.
11. What is your view about having a wetland protection and restoration policy?
12. Is there measurable progress on initiatives implemented by your institution to curb wetland degradation? Explain how.
13. How effective have interventions been? What has been achieved?
14. Based on your answer above, how do you foresee the future with respect to the importance and value of wetlands?
15. Do you think valuing (conducting cost and benefit analysis) wetlands will change the narrative of wetland protection and conservation policy?
    If yes, why do you think the narrative will change and in what way will it change?
    If no, explain why?
16. Would your institution be willing to financially support a study on economics of land degradation in Lesotho? Explain its feasibility
17. Can your institution foster collaborations with private sector? How important is this in restoration projects?
18. What will be the climax of developing a wetland protection policy in Lesotho?
1. Is there anything you would like to add regarding this study? **(Ideas or reference material)**

END,
THANK YOU FOR YOUR PARTICIPATION!

Appendix IV: Interview frame for Economics of Land Degradation representative

1. Identity (Name, Gender, capacity and institution)
2. Describe what ELD Initiative is about (vision/ goals/ objectives)
3. Explain the ELD process
4. What is required to implement the ELD concept?
5. Do you think it can be a solution to wetland degradation? Are there benefits associated with ELD? Explain using examples
6. What will be your invitation message to encourage new countries like Lesotho to conduct an ELD study? (Importance of ELD)
7. What should Lesotho expect in the process of building an ELD study? What are the key issues that Lesotho needs to be aware of?
8. Has there been any success stories in restoration and policy review/ formulation following an ELD study? (Cite examples from Africa)
9. How are the ELD case studies funded?
10. What were challenges in conducting ELD case studies, how were they solved?
11. What can you probe about the journey of ELD or taking action in Lesotho? (Zoom into the future)
12. How can ELD Initiate support Lesotho as a developing country in trainings and monitoring.
13. Is there anything you would like to add/ share regarding this study? **(Ideas or reference material)**

END,
THANK YOU FOR YOUR PARTICIPATION!